

October 2022

VOLUME 2

TRANSPORTATION IMPACT STUDY

for

**PENNMARK
PROPERTY**

in

**Mount Joy Township
Lancaster County, Pennsylvania**

Prepared for:

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APPENDIX L1

EXISTING CONDITIONS ANALYSES

Lanes and Geometrics
3: Maytown Rd & SR 0230

2022 Existing
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (vph)	386	77	79	331	140	136
Future Volume (vph)	386	77	79	331	140	136
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1679	0	1662	1766	1535	0
Flt Permitted			0.276		0.975	
Satd. Flow (perm)	1679	0	483	1766	1535	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	18					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	515	0	88	368	307	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	31.8		42.5	41.3	18.3	
Actuated g/C Ratio	0.45		0.61	0.59	0.26	
v/c Ratio	0.67		0.21	0.35	0.77	
Control Delay	21.3		5.2	6.3	38.4	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	21.3		5.2	6.3	38.4	

Lanes and Geometrics
3: Maytown Rd & SR 0230

2022 Existing
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	C		A	A	D	
Approach Delay	21.3			6.1	38.4	
Approach LOS	C			A	D	
Queue Length 50th (ft)	174		12	52	120	
Queue Length 95th (ft)	#292		m22	76	#236	
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	771		427	1041	412	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.67		0.21	0.35	0.75	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 20.0

Intersection LOS: B

Intersection Capacity Utilization 60.1%

ICU Level of Service B

Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2022 Existing
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	386	77	79	331	140	136
Future Volume (veh/h)	386	77	79	331	140	136
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	429	80	88	368	156	151
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	659	123	467	1190	193	187
Arrive On Green	0.49	0.47	0.15	1.00	0.23	0.22
Sat Flow, veh/h	1351	252	1846	1927	825	798
Grp Volume(v), veh/h	0	509	88	368	308	0
Grp Sat Flow(s),veh/h/ln	0	1602	1846	1927	1628	0
Q Serve(g_s), s	0.0	16.7	1.4	0.0	12.5	0.0
Cycle Q Clear(g_c), s	0.0	16.7	1.4	0.0	12.5	0.0
Prop In Lane		0.16	1.00		0.51	0.49
Lane Grp Cap(c), veh/h	0	781	467	1190	381	0
V/C Ratio(X)	0.00	0.65	0.19	0.31	0.81	0.00
Avail Cap(c_a), veh/h	0	781	543	1190	437	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.5	8.2	0.0	25.6	0.0
Incr Delay (d2), s/veh	0.0	4.2	0.2	0.7	14.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	10.1	0.8	0.4	10.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	17.7	8.4	0.7	40.5	0.0
LnGrp LOS	A	B	A	A	D	A
Approach Vol, veh/h	509			456	308	
Approach Delay, s/veh	17.7			2.2	40.5	
Approach LOS	B			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.1	39.3		21.6		48.4
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.4	18.7		14.5		2.0
Green Ext Time (p_c), s	0.1	5.2		0.9		9.3
Intersection Summary						
HCM 6th Ctrl Delay			17.7			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes and Geometrics
5: SR 0230 & Groff Ave

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	550	1	0	502	40	0	0	2	40	0	34
Future Volume (vph)	25	550	1	0	502	40	0	0	2	40	0	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	619	0	0	609	0	0	2	0	45	38	0
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	44.7%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	550	1	0	502	40	0	0	2	40	0	34
Future Vol, veh/h	25	550	1	0	502	40	0	0	2	40	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	28	618	1	0	564	45	0	0	2	45	0	38
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	609	0	0	619	0	0	1282	1284	620	1264	1262	588
Stage 1	-	-	-	-	-	-	675	675	-	587	587	-
Stage 2	-	-	-	-	-	-	607	609	-	677	675	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	771	-	-	597	-	-	180	192	438	198	212	503
Stage 1	-	-	-	-	-	-	539	492	-	619	551	-
Stage 2	-	-	-	-	-	-	585	523	-	558	510	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	771	-	-	597	-	-	162	185	438	191	204	503
Mov Cap-2 Maneuver	-	-	-	-	-	-	162	185	-	191	204	-
Stage 1	-	-	-	-	-	-	520	474	-	597	551	-
Stage 2	-	-	-	-	-	-	540	523	-	535	492	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0			13.3			21.8		
HCM LOS							B			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2			
Capacity (veh/h)	438	771	-	-	597	-	-	191	503			
HCM Lane V/C Ratio	0.005	0.036	-	-	-	-	-	0.235	0.076			
HCM Control Delay (s)	13.3	9.8	-	-	0	-	-	29.6	12.7			
HCM Lane LOS	B	A	-	-	A	-	-	D	B			
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.9	0.2			

Lanes and Geometrics
7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	463	43	61	434	6	100	2	70	4	3	2
Future Volume (vph)	3	463	43	61	434	6	100	2	70	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.488			0.361			0.754			0.705		
Satd. Flow (perm)	849	1667	1552	586	1558	1608	1302	1516	0	1307	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45			78			2
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	514	48	68	482	7	111	80	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	44.6	44.6	44.6	52.3	52.1	52.1	10.8	10.8		10.6	10.6	
Actuated g/C Ratio	0.64	0.64	0.64	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.48	0.05	0.13	0.42	0.01	0.56	0.27		0.02	0.02	
Control Delay	6.7	7.8	0.1	1.5	2.7	0.0	38.1	9.8		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	7.8	0.1	1.5	2.7	0.0	38.1	9.8		24.5	21.0	

Lanes and Geometrics
7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		7.1			2.6			26.3			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	79	0	6	53	0	44	1		1	1	
Queue Length 95th (ft)	m1	m113	m0	2	11	m0	91	34		9	10	
Internal Link Dist (ft)		980			1260			220			220	
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	541	1063	1037	553	1160	1209	225	326		225	320	
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	0.01	0.48	0.05	0.12	0.42	0.01	0.49	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.1

Intersection LOS: A

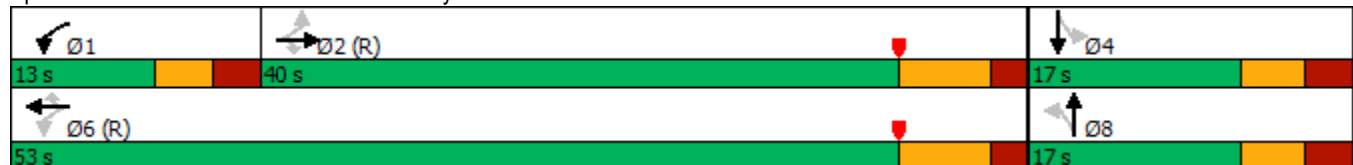
Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	463	43	61	434	6	100	2	70	4	3	2
Future Volume (veh/h)	3	463	43	61	434	6	100	2	70	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	514	32	68	482	6	111	2	40	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	716	1193	1055	671	1171	1122	278	10	192	256	141	94
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	1001	1947	1722	1640	1609	1542	1460	80	1608	1471	1175	784
Grp Volume(v), veh/h	3	514	32	68	482	6	111	0	42	4	0	5
Grp Sat Flow(s),veh/h/ln	1001	1947	1722	1640	1609	1542	1460	0	1688	1471	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	5.1	0.0	1.6	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.9	0.0	0.0	5.1	0.0	1.6	1.3	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.40
Lane Grp Cap(c), veh/h	716	1193	1055	671	1171	1122	278	0	202	256	0	234
V/C Ratio(X)	0.00	0.43	0.03	0.10	0.41	0.01	0.40	0.00	0.21	0.02	0.00	0.02
Avail Cap(c_a), veh/h	716	1193	1055	787	1171	1122	355	0	292	334	0	339
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(l)	1.00	1.00	1.00	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.2	0.0	0.0	29.4	0.0	28.3	28.2	0.0	27.4
Incr Delay (d2), s/veh	0.0	1.1	0.1	0.1	1.0	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.7	0.0	0.3	0.6	0.0	3.3	0.0	1.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.1	0.1	3.2	1.0	0.0	30.3	0.0	28.8	28.2	0.0	27.4
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	549		556				153			9		
Approach Delay, s/veh	1.1		1.3				29.9			27.8		
Approach LOS	A		A				C			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.0	48.7	13.3		56.7		13.3					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.4	2.5	3.8		2.5		7.6					
Green Ext Time (p_c), s	0.0	0.6	0.0		0.6		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.8
HCM 6th LOS A

Notes

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

Lanes and Geometrics
10: Driveway/Market Sq Dr & SR 0230

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	391	13	5	469	12	9	0	14	6	0	8
Future Volume (vph)	25	391	13	5	469	12	9	0	14	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1659	0	1744	1654	1445	0	1729	0	1719	1501	0
Flt Permitted	0.412			0.510				0.866				
Satd. Flow (perm)	727	1659	0	936	1654	1415	0	1526	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				126		139			435	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	434	0	5	504	13	0	25	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.29		0.01	0.36	0.01		0.09		0.03	0.02	
Control Delay	0.9	2.3		3.8	4.6	0.0		0.7		28.5	0.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.9	2.3		3.8	4.6	0.0		0.7		28.5	0.0	

Lanes and Geometrics
10: Driveway/Market Sq Dr & SR 0230

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.2			4.5			0.7			11.4	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m2	63		m2	85	m0		0		13	0	
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	717	1492		783	1383	1204		325		242	578	
Starvation Cap Reductn	0	0		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	0.04	0.29		0.01	0.36	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 3.5

Intersection LOS: A

Intersection Capacity Utilization 42.5%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2022 Existing
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	391	13	5	469	12	9	0	14	6	0	8
Future Volume (veh/h)	25	391	13	5	469	12	9	0	14	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	27	420	14	5	504	13	10	0	14	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	740	1283	43	823	1298	1125	89	0	22	159	68	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1565	52	994	1793	1554	426	0	596	1361	1837	0
Grp Volume(v), veh/h	27	0	434	5	504	13	24	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1617	994	1793	1554	1021	0	0	1361	1837	0
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.42		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	740	0	1326	823	1298	1125	96	0	0	159	68	0
V/C Ratio(X)	0.04	0.00	0.33	0.01	0.39	0.01	0.25	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	839	0	1326	823	1298	1125	241	0	0	291	247	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)	0.87	0.00	0.87	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	0.0	0.0	0.0	0.0	0.0	34.0	0.0	0.0	32.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.0	0.8	0.0	1.3	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.4	0.0	0.5	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.6	0.0	0.8	0.0	35.3	0.0	0.0	32.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	461			522			24			6		
Approach Delay, s/veh	0.6			0.8			35.3			32.7		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.7	56.1	7.2		62.8		7.2					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.7	2.5	2.7		2.5		3.6					
Green Ext Time (p_c), s	0.0	0.6	0.0		0.5		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				1.7								
HCM 6th LOS				A								

Lanes and Geometrics
13: Sheaffer Rd & SR 0230

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	368	1	10	388	20	58	25	35	17	12	32
Future Volume (vph)	31	368	1	10	388	20	58	25	35	17	12	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1593	0	1248	1493	0	0	1794	0
Flt Permitted	0.493			0.520			0.884				0.893	
Satd. Flow (perm)	874	1685	0	682	1593	0	1161	1493	0	0	1624	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6			38			34	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	397	0	11	439	0	62	65	0	0	65	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	52.2	52.2		52.2	52.2		11.2	11.2			11.2	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.05	0.32		0.02	0.37		0.34	0.24			0.23	
Control Delay	1.1	1.6		4.6	5.8		29.7	15.0			15.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.6		4.6	5.8		29.7	15.0			15.6	

Lanes and Geometrics
13: Sheaffer Rd & SR 0230

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A		C	B			B	
Approach Delay		1.5			5.8			22.1			15.6	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	7		1	62		24	10			12	
Queue Length 95th (ft)	3	16		7	139		53	38			39	
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	652	1257		508	1190		331	453			488	
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	0.05	0.32		0.02	0.37		0.19	0.14			0.13	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 6.6

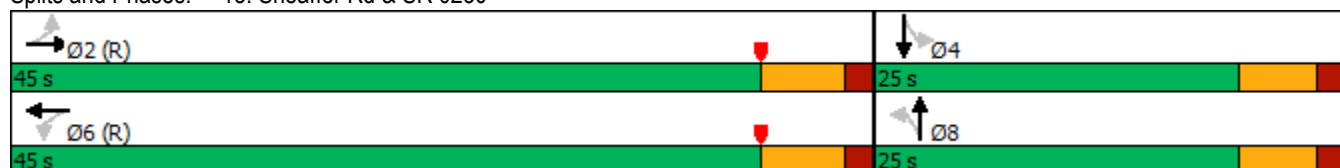
Intersection LOS: A

Intersection Capacity Utilization 45.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



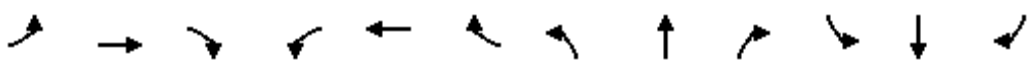
HCM 6th Signalized Intersection Summary
13: Sheaffer Rd & SR 0230

2022 Existing
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	368	1	10	388	20	58	25	35	17	12	32
Future Volume (veh/h)	31	368	1	10	388	20	58	25	35	17	12	32
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		0.99	0.99		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	33	396	0	11	417	21	62	27	16	18	13	16
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	717	1286	0	704	1320	66	206	93	55	112	62	53
Arrive On Green	1.00	1.00	0.00	0.77	0.77	0.75	0.09	0.09	0.08	0.08	0.09	0.08
Sat Flow, veh/h	890	1680	0	785	1724	87	1018	994	589	435	664	567
Grp Volume(v), veh/h	33	396	0	11	0	438	62	0	43	47	0	0
Grp Sat Flow(s),veh/h/ln	890	1680	0	785	0	1811	1018	0	1583	1666	0	0
Q Serve(g_s), s	0.3	0.0	0.0	0.2	0.0	5.3	1.6	0.0	1.8	0.1	0.0	0.0
Cycle Q Clear(g_c), s	5.5	0.0	0.0	0.2	0.0	5.3	3.5	0.0	1.8	1.9	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.05	1.00		0.37	0.38		0.34
Lane Grp Cap(c), veh/h	717	1286	0	704	0	1386	206	0	147	202	0	0
V/C Ratio(X)	0.05	0.31	0.00	0.02	0.00	0.32	0.30	0.00	0.29	0.23	0.00	0.00
Avail Cap(c_a), veh/h	717	1286	0	704	0	1386	402	0	452	525	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)	0.97	0.97	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.3	0.0	0.0	2.0	0.0	2.5	30.3	0.0	29.8	29.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.6	0.0	0.0	0.0	0.6	0.8	0.0	1.1	0.6	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(95%),veh/ln	0.0	0.4	0.0	0.0	0.0	1.7	1.8	0.0	1.2	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.4	0.6	0.0	2.0	0.0	3.1	31.1	0.0	30.9	30.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	429		449			105			47			
Approach Delay, s/veh	0.6		3.1			31.0			30.5			
Approach LOS	A		A			C			C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	58.5		11.5		58.5		11.5					
Change Period (Y+Rc), s	* 5.9		6.0		* 5.9		6.0					
Max Green Setting (Gmax), s	* 39		19.0		* 39		19.0					
Max Q Clear Time (g_c+I1), s	2.0		3.9		7.3		5.5					
Green Ext Time (p_c), s	11.4		0.1		12.3		0.3					
Intersection Summary												
HCM 6th Ctrl Delay			6.2									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	306	0	86	488	125	0	0	170	55
Future Volume (vph)	0	0	0	306	0	86	488	125	0	0	170	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.486					
Satd. Flow (perm)	0	0	0	0	1546	1145	790	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	319	90	508	130	0	0	177	57
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					15.3	15.3	32.2	32.2			15.2	15.2
Actuated g/C Ratio					0.27	0.27	0.56	0.56			0.27	0.27
v/c Ratio					0.77	0.21	0.84	0.16			0.44	0.11
Control Delay					34.5	1.8	24.9	6.9			21.6	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					34.5	1.8	24.9	6.9			21.6	0.4
LOS					C	A	C	A			C	A
Approach Delay					27.3			21.2			16.5	
Approach LOS					C			C			B	
Queue Length 50th (ft)					101	0	106	20			51	0
Queue Length 95th (ft)					#218	7	#256	42			101	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					448	448	605	851			456	564
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					0.71	0.20	0.84	0.15			0.39	0.10

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 57.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 22.3

Intersection LOS: C

Intersection Capacity Utilization 81.9%

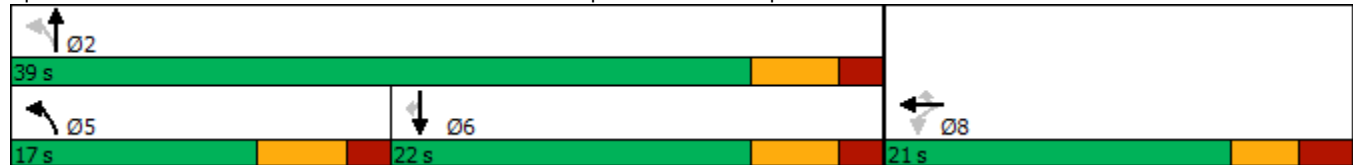
ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶	↷			↷	↶
Traffic Volume (veh/h)	0	0	0	306	0	86	488	125	0	0	170	55
Future Volume (veh/h)	0	0	0	306	0	86	488	125	0	0	170	55
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/l				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				319	0	0	508	130	0	0	177	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				422	0		690	860	0	0	418	
Arrive On Green				0.22	0.00	0.00	0.23	0.58	0.00	0.00	0.25	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				319	0	0	508	130	0	0	177	0
Grp Sat Flow(s),veh/h/l				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				8.7	0.0	0.0	11.4	2.1	0.0	0.0	4.6	0.0
Cycle Q Clear(g_c), s				8.7	0.0	0.0	11.4	2.1	0.0	0.0	4.6	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				422	0		690	860	0	0	418	
V/C Ratio(X)				0.76	0.00		0.74	0.15	0.00	0.00	0.42	
Avail Cap(c_a), veh/h				569	0		690	975	0	0	546	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.9	0.0	0.0	9.4	5.0	0.0	0.0	16.2	0.0
Incr Delay (d2), s/veh				4.0	0.0	0.0	4.1	0.3	0.0	0.0	2.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/l				3.8	0.0	0.0	3.4	0.5	0.0	0.0	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.8	0.0	0.0	13.5	5.3	0.0	0.0	18.7	0.0
LnGrp LOS				C	A		B	A	A	A	B	
Approach Vol, veh/h					319			638			177	
Approach Delay, s/veh					22.8			11.8			18.7	
Approach LOS					C			B			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		16.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		4.1			13.4	6.6		10.7				
Green Ext Time (p_c), s		2.8			0.0	1.9		0.7				
Intersection Summary												
HCM 6th Ctrl Delay				16.0								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2022 Existing

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	2	223	0	0	0	0	582	525	105	373	0
Future Volume (vph)	31	2	223	0	0	0	0	582	525	105	373	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	35	237	0	0	0	0	1178	0	112	397	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 81.9%

ICU Level of Service D

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2022 Existing
AM Peak Hour

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	31	2	223	0	0	0	0	582	525	105	373	0
Future Vol, veh/h	31	2	223	0	0	0	0	582	525	105	373	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	33	2	237	0	0	0	0	619	559	112	397	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1240	1240	397	-	0	0	619	0	0
Stage 1	621	621	-	-	-	-	-	-	-
Stage 2	619	619	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	188	217	690	0	-	-	753	-	0
Stage 1	637	535	-	0	-	-	-	-	0
Stage 2	639	536	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	160	0	690	-	-	-	753	-	-
Mov Cap-2 Maneuver	160	0	-	-	-	-	-	-	-
Stage 1	637	0	-	-	-	-	-	-	-
Stage 2	544	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.6	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	160	690	753	-
HCM Lane V/C Ratio	-	-	0.219	0.344	0.148	-
HCM Control Delay (s)	-	-	33.7	12.9	10.6	-
HCM Lane LOS	-	-	D	B	B	-
HCM 95th %tile Q(veh)	-	-	0.8	1.5	0.5	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2022 Existing
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	24	0	1090	588	5
Future Volume (vph)	6	24	0	1090	588	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1624	0	0	1734	1653	0
Flt Permitted	0.990					
Satd. Flow (perm)	1624	0	0	1734	1653	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	0	0	1211	659	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	67.4%			ICU Level of Service C		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2022 Existing
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	24	0	1090	588	5
Future Vol, veh/h	6	24	0	1090	588	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	27	0	1211	653	6

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1867	656	659	0	-	0
Stage 1	656	-	-	-	-	-
Stage 2	1211	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	86	491	764	-	-	-
Stage 1	582	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	86	491	764	-	-	-
Mov Cap-2 Maneuver	86	-	-	-	-	-
Stage 1	582	-	-	-	-	-
Stage 2	310	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	764	-	253	-	-
HCM Lane V/C Ratio	-	-	0.132	-	-
HCM Control Delay (s)	0	-	21.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	287	19	75	8	12	73	26	730	8	10	485	129
Future Volume (vph)	287	19	75	8	12	73	26	730	8	10	485	129
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1585	0	1391	1565	0	1500	1614	0	1628	1578	0
Flt Permitted	0.696			0.690			0.271			0.176		
Satd. Flow (perm)	1175	1585	0	1009	1565	0	428	1614	0	302	1578	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		83			81			1			31	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	319	104	0	9	94	0	29	820	0	11	682	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	0.95	0.20		0.03	0.19		0.12	0.90		0.06	0.76	
Control Delay	66.9	8.0		18.6	7.4		6.9	25.6		8.1	17.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	66.9	8.0		18.6	7.4		6.9	25.6		8.1	17.9	
LOS	E	A		B	A		A	C		A	B	
Approach Delay		52.4			8.4			24.9			17.7	
Approach LOS		D			A			C			B	
Queue Length 50th (ft)	134	7		3	4		6	290		2	193	
Queue Length 95th (ft)	#284	39		13	35		m7	#530		9	333	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	335	512		288	505		241	911		170	903	
Starvation Cap Reductn	0	0		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	0.95	0.20		0.03	0.19		0.12	0.90		0.06	0.76	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 27.3

Intersection LOS: C

Intersection Capacity Utilization 73.3%

ICU Level of Service D

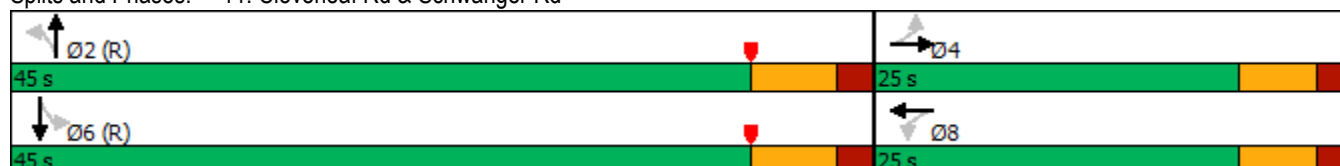
Analysis Period (min) 15

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2022 Existing
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	287	19	75	8	12	73	26	730	8	10	485	129
Future Volume (veh/h)	287	19	75	8	12	73	26	730	8	10	485	129
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	319	21	83	9	13	81	29	811	9	11	539	143
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	424	104	411	363	58	362	309	994	11	495	776	206
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1361	364	1439	1080	204	1268	729	1761	20	695	1376	365
Grp Volume(v), veh/h	319	0	104	9	0	94	29	0	820	11	0	682
Grp Sat Flow(s),veh/h/ln	1361	0	1804	1080	0	1472	729	0	1780	695	0	1741
Q Serve(g_s), s	16.4	0.0	3.1	0.4	0.0	3.5	1.5	0.0	0.0	0.5	0.0	19.7
Cycle Q Clear(g_c), s	19.8	0.0	3.1	3.5	0.0	3.5	21.2	0.0	0.0	0.5	0.0	19.7
Prop In Lane	1.00		0.80	1.00		0.86	1.00		0.01	1.00		0.21
Lane Grp Cap(c), veh/h	424	0	515	363	0	421	309	0	1005	495	0	982
V/C Ratio(X)	0.75	0.00	0.20	0.02	0.00	0.22	0.09	0.00	0.82	0.02	0.00	0.69
Avail Cap(c_a), veh/h	424	0	515	363	0	421	309	0	1005	495	0	982
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.80	0.00	0.80	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	19.3	20.3	0.0	19.4	5.3	0.0	0.0	6.8	0.0	11.0
Incr Delay (d2), s/veh	7.3	0.0	0.2	0.0	0.0	0.3	0.5	0.0	5.9	0.1	0.0	4.0
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	5.8	0.0	1.2	0.1	0.0	1.1	0.2	0.0	1.7	0.1	0.0	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	0.0	19.5	20.3	0.0	19.7	5.8	0.0	5.9	6.8	0.0	15.1
LnGrp LOS	C	A	B	C	A	B	A	A	A	A	A	B
Approach Vol, veh/h	423			103			849			693		
Approach Delay, s/veh	30.4			19.7			5.9			14.9		
Approach LOS	C			B			A			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			21.8			21.7			5.5		
Green Ext Time (p_c), s	26.6			0.0			12.3			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	14.6											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	16	16	1	9	2	748	7	24	528	1
Future Volume (vph)	15	0	16	16	1	9	2	748	7	24	528	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1682	0	0	1561	0	0	1615	1648
Flt Permitted		0.952			0.799			0.999			0.958	
Satd. Flow (perm)	0	1656	1581	0	1387	0	0	1559	0	0	1550	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		9			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	17	0	27	0	0	788	0	0	575	1
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		7.7	7.7		7.7			62.6			62.6	62.6
Actuated g/C Ratio		0.11	0.11		0.11			0.89			0.89	0.89
v/c Ratio		0.09	0.08		0.17			0.57			0.41	0.00
Control Delay		28.3	2.7		23.9			5.0			5.7	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		28.3	2.7		23.9			5.0			5.7	0.0
LOS		C	A		C			A			A	A
Approach Delay		15.1			23.9			5.0			5.7	
Approach LOS		B			C			A			A	
Queue Length 50th (ft)		6	0		7			0			0	0
Queue Length 95th (ft)		22	5		28			260			m257	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		295	320		255			1394			1386	1478
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		0.05	0.05		0.11			0.57			0.41	0.00

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 5.8

Intersection LOS: A

Intersection Capacity Utilization 67.5%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

											
Ø2 (R)									Ø4		
53 s									17 s		
											
Ø6 (R)									Ø8		
53 s									17 s		

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	16	16	1	9	2	748	7	24	528	1
Future Volume (veh/h)	15	0	16	16	1	9	2	748	7	24	528	1
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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	16	0	17	17	1	9	2	779	7	25	550	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	188	0	84	121	2	20	52	1314	12	79	1348	1341
Arrive On Green	0.04	0.00	0.05	0.04	0.05	0.04	0.80	0.81	0.80	1.00	1.00	1.00
Sat Flow, veh/h	1607	0	1586	709	42	375	1	1619	15	31	1661	1652
Grp Volume(v), veh/h	16	0	17	27	0	0	788	0	0	575	0	1
Grp Sat Flow(s),veh/h/ln	1607	0	1586	1126	0	0	1634	0	0	1693	0	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	0.0	0.7	1.9	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.63		0.33	0.00		0.01	0.04		1.00
Lane Grp Cap(c), veh/h	165	0	84	127	0	0	1354	0	0	1403	0	1341
V/C Ratio(X)	0.10	0.00	0.20	0.21	0.00	0.00	0.58	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	335	0	283	312	0	0	1354	0	0	1403	0	1341
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.59	0.00	0.59
Uniform Delay (d), s/veh	32.2	0.0	31.7	33.1	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.2	0.8	0.0	0.0	1.8	0.0	0.0	0.5	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	0.3	0.0	0.3	0.5	0.0	0.0	1.6	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.4	0.0	32.9	33.9	0.0	0.0	4.3	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	33		27			788			576			
Approach Delay, s/veh	32.7		33.9			4.3			0.5			
Approach LOS	C		C			A			A			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	61.8		8.2			61.8			8.2			
Change Period (Y+Rc), s	6.0		5.5			6.0			5.5			
Max Green Setting (Gmax), s	47.0		11.5			47.0			11.5			
Max Q Clear Time (g_c+I1), s	14.5		2.7			2.0			3.9			
Green Ext Time (p_c), s	22.8		0.0			19.8			0.0			
Intersection Summary												
HCM 6th Ctrl Delay	4.0											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	259	173	31	3	166	194	69	352	11	101	215	203
Future Volume (vph)	259	173	31	3	166	194	69	352	11	101	215	203
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1716	0	1500	1509	1388
Flt Permitted	0.439			0.641			0.563			0.300		
Satd. Flow (perm)	686	1660	1088	804	1649	1561	970	1716	0	473	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		2				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	276	184	33	3	177	206	73	386	0	107	229	216
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	29.7	29.7	29.7	14.4	14.4	14.4	25.8	19.8		26.0	19.9	19.9
Actuated g/C Ratio	0.41	0.41	0.41	0.20	0.20	0.20	0.36	0.28		0.36	0.28	0.28
v/c Ratio	0.71	0.27	0.06	0.02	0.54	0.41	0.17	0.81		0.38	0.55	0.39
Control Delay	29.7	17.1	0.2	25.3	34.3	5.3	13.3	40.9		16.7	29.1	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	29.7	17.1	0.2	25.3	34.3	5.3	13.3	40.9		16.7	29.1	5.3
LOS	C	B	A	C	C	A	B	D		B	C	A
Approach Delay		23.0			18.8			36.6			17.4	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	97	59	0	1	77	0	18	163		27	89	0
Queue Length 95th (ft)	#187	105	0	8	138	37	44	#331		61	170	43

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	391	778	589	205	421	577	425	525		287	461	585
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.71	0.24	0.06	0.01	0.42	0.36	0.17	0.74		0.37	0.50	0.37

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 71.8

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 23.8

Intersection LOS: C

Intersection Capacity Utilization 70.5%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø5		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	173	31	3	166	194	69	352	11	101	215	203
Future Volume (veh/h)	259	173	31	3	166	194	69	352	11	101	215	203
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	276	184	20	3	177	0	73	374	10	107	229	186
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	449	709	500	268	333		376	471	13	303	403	356
Arrive On Green	0.14	0.41	0.41	0.19	0.19	0.00	0.06	0.24	0.22	0.09	0.26	0.26
Sat Flow, veh/h	1641	1709	1206	837	1724	1532	1988	2004	54	1522	1528	1352
Grp Volume(v), veh/h	276	184	20	3	177	0	73	0	384	107	229	186
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	837	1724	1532	1988	0	2057	1522	1528	1352
Q Serve(g_s), s	8.6	4.8	0.7	0.2	6.2	0.0	1.8	0.0	11.9	3.4	8.8	7.9
Cycle Q Clear(g_c), s	8.6	4.8	0.7	0.2	6.2	0.0	1.8	0.0	11.9	3.4	8.8	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	449	709	500	268	333		376	0	484	303	403	356
V/C Ratio(X)	0.61	0.26	0.04	0.01	0.53		0.19	0.00	0.79	0.35	0.57	0.52
Avail Cap(c_a), veh/h	449	834	588	329	459		486	0	654	344	486	430
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	13.0	11.8	22.1	24.5	0.0	17.7	0.0	24.3	17.6	21.6	21.3
Incr Delay (d2), s/veh	2.5	0.1	0.0	0.0	0.5	0.0	0.2	0.0	4.8	0.7	1.3	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	3.0	1.5	0.2	0.0	2.3	0.0	0.8	0.0	6.2	1.1	3.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.4	13.0	11.8	22.1	25.0	0.0	17.9	0.0	29.2	18.3	22.8	22.5
LnGrp LOS	B	B	B	C	C		B	A	C	B	C	C
Approach Vol, veh/h	480			180			457			522		
Approach Delay, s/veh	16.6			25.0			27.4			21.8		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	12.2	21.9		33.6	10.3	23.8				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	11.1	8.7	5.9	13.9		7.3	4.3	11.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0		0.1	0.0	1.5				

Intersection Summary

HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2022 Existing
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	258	364	23	25	3
Future Volume (vph)	3	258	364	23	25	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1723	0	1550	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1723	0	1550	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	284	425	0	30	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 30.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	258	364	23	25	3
Future Vol, veh/h	3	258	364	23	25	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	284	400	25	27	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	425	0	-	0	703	413
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	290	-
Critical Hdwy	4.4	-	-	-	6.84	6.7
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	3.3	-	-	-	3	3.4
Pot Cap-1 Maneuver	784	-	-	-	417	593
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	844	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	784	-	-	-	415	593
Mov Cap-2 Maneuver	-	-	-	-	542	-
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	844	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		12		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	784	-	-	-	547	
HCM Lane V/C Ratio	0.004	-	-	-	0.056	
HCM Control Delay (s)	9.6	-	-	-	12	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2022 Existing
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	22	33	6	42	109	45	293	9	25	151	71
Future Volume (vph)	61	22	33	6	42	109	45	293	9	25	151	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1308	0	0	1540	0	0	1664	0	0	1499	0
Flt Permitted		0.974			0.998			0.994			0.995	
Satd. Flow (perm)	0	1308	0	0	1540	0	0	1664	0	0	1499	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	121	0	0	164	0	0	361	0	0	257	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	52.2%											
Analysis Period (min)	15											
	ICU Level of Service A											

Intersection

Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	61	22	33	6	42	109	45	293	9	25	151	71
Future Vol, veh/h	61	22	33	6	42	109	45	293	9	25	151	71
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	64	23	34	6	44	114	47	305	9	26	157	74
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.7	10.4	15.1	12.8
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	53%	4%	10%
Vol Thru, %	84%	19%	27%	61%
Vol Right, %	3%	28%	69%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	347	116	157	247
LT Vol	45	61	6	25
Through Vol	293	22	42	151
RT Vol	9	33	109	71
Lane Flow Rate	361	121	164	257
Geometry Grp	1	1	1	1
Degree of Util (X)	0.55	0.225	0.249	0.41
Departure Headway (Hd)	5.481	6.698	5.484	5.741
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	658	534	653	625
Service Time	3.525	4.757	3.539	3.789
HCM Lane V/C Ratio	0.549	0.227	0.251	0.411
HCM Control Delay	15.1	11.7	10.4	12.8
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	3.4	0.9	1	2

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2022 Existing
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	621	84	189	468	121	123
Future Volume (vph)	621	84	189	468	121	123
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1799	0	1744	1958	1583	0
Flt Permitted			0.137		0.976	
Satd. Flow (perm)	1799	0	251	1958	1583	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	12					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	774	0	208	514	268	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	0.84		0.65	0.40	0.81	
Control Delay	26.9		16.0	7.5	50.7	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	26.9		16.0	7.5	50.7	
LOS	C		B	A	D	
Approach Delay	26.9			10.0	50.7	
Approach LOS	C			A	D	
Queue Length 50th (ft)	308		32	115	128	
Queue Length 95th (ft)	#538		m56	m147	#251	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2022 Existing
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	923		318	1292	332	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.84		0.65	0.40	0.81	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 23.6

Intersection LOS: C

Intersection Capacity Utilization 78.0%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2022 Existing
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	621	84	189	468	121	123
Future Volume (veh/h)	621	84	189	468	121	123
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	682	83	208	514	133	135
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	822	100	374	1408	162	164
Arrive On Green	0.54	0.53	0.16	1.00	0.20	0.18
Sat Flow, veh/h	1517	185	1914	2090	825	837
Grp Volume(v), veh/h	0	765	208	514	269	0
Grp Sat Flow(s),veh/h/ln	0	1702	1914	2090	1668	0
Q Serve(g_s), s	0.0	30.0	3.6	0.0	12.4	0.0
Cycle Q Clear(g_c), s	0.0	30.0	3.6	0.0	12.4	0.0
Prop In Lane		0.11	1.00		0.49	0.50
Lane Grp Cap(c), veh/h	0	922	374	1408	327	0
V/C Ratio(X)	0.00	0.83	0.56	0.36	0.82	0.00
Avail Cap(c_a), veh/h	0	922	407	1408	350	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	15.3	12.8	0.0	31.1	0.0
Incr Delay (d2), s/veh	0.0	8.6	1.4	0.7	18.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	17.7	2.9	0.5	10.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	23.9	14.2	0.7	49.7	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	765			722	269	
Approach Delay, s/veh	23.9			4.6	49.7	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.6	48.5		20.9		59.1
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	5.6	32.0		14.4		2.0
Green Ext Time (p_c), s	0.1	6.3		0.3		15.6
Intersection Summary						
HCM 6th Ctrl Delay			19.9			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	777	0	0	926	83	1	0	2	29	0	47
Future Volume (vph)	27	777	0	0	926	83	1	0	2	29	0	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	835	0	0	1085	0	0	3	0	31	51	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	777	0	0	926	83	1	0	2	29	0	47
Future Vol, veh/h	27	777	0	0	926	83	1	0	2	29	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	29	835	0	0	996	89	1	0	2	31	0	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1085	0	0	835	0	0	1960	1978	835	1935	1934	1042
Stage 1	-	-	-	-	-	-	893	893	-	1041	1041	-
Stage 2	-	-	-	-	-	-	1067	1085	-	894	893	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	598	-	-	465	-	-	63	78	405	73	92	319
Stage 1	-	-	-	-	-	-	414	401	-	366	368	-
Stage 2	-	-	-	-	-	-	334	333	-	434	421	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	598	-	-	465	-	-	51	74	405	70	88	319
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	74	-	70	88	-
Stage 1	-	-	-	-	-	-	394	382	-	348	368	-
Stage 2	-	-	-	-	-	-	281	333	-	411	401	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	35.3	46.7
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	122	598	-	-	465	-	-	70	319
HCM Lane V/C Ratio	0.026	0.049	-	-	-	-	-	0.445	0.158
HCM Control Delay (s)	35.3	11.3	-	-	0	-	-	92.5	18.4
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	1.8	0.6

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	583	36	149	727	17	264	3	114	23	8	16
Future Volume (vph)	14	583	36	149	727	17	264	3	114	23	8	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1747	0
Flt Permitted	0.352			0.229			0.741			0.679		
Satd. Flow (perm)	612	1766	1550	379	1697	1608	1316	1576	0	1259	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40		119			17	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	607	38	155	757	18	275	122	0	24	25	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	37.9	37.9	37.9	52.0	50.7	50.7	18.6	18.6		18.6	18.6	
Actuated g/C Ratio	0.47	0.47	0.47	0.65	0.63	0.63	0.23	0.23		0.23	0.23	
v/c Ratio	0.05	0.73	0.05	0.42	0.70	0.02	0.90	0.27		0.08	0.06	
Control Delay	11.2	15.5	0.2	5.5	6.1	0.1	63.0	7.2		24.7	14.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.2	15.5	0.2	5.5	6.1	0.1	63.0	7.2		24.7	14.4	
LOS	B	B	A	A	A	A	E	A		C	B	
Approach Delay		14.5			5.9			45.8			19.4	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	2	104	0	4	25	0	132	1		9	3	
Queue Length 95th (ft)	m5	m179	m0	m15	52	m0	#269	41		28	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	289	836	794	372	1074	1032	314	466		300	430	
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	0.05	0.73	0.05	0.42	0.70	0.02	0.88	0.26		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 16.8

Intersection LOS: B

Intersection Capacity Utilization 88.7%

ICU Level of Service E

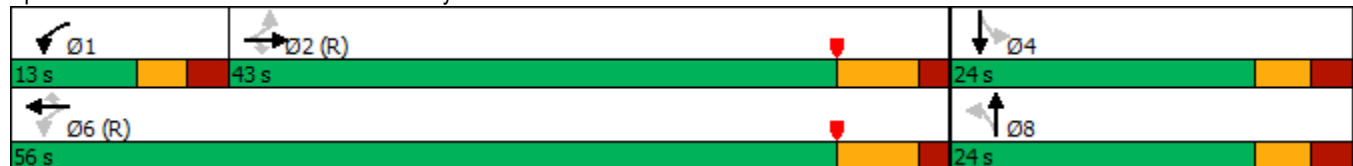
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	583	36	149	727	17	264	3	114	23	8	16
Future Volume (veh/h)	14	583	36	149	727	17	264	3	114	23	8	16
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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	15	607	23	155	757	15	275	3	79	24	8	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	475	1017	873	600	1109	985	420	14	369	365	156	272
Arrive On Green	1.00	1.00	1.00	0.16	1.00	1.00	0.23	0.23	0.21	0.23	0.23	0.21
Sat Flow, veh/h	769	2032	1745	1666	1736	1542	1470	62	1623	1419	684	1198
Grp Volume(v), veh/h	15	607	23	155	757	15	275	0	82	24	0	22
Grp Sat Flow(s),veh/h/ln	769	2032	1745	1666	1736	1542	1470	0	1685	1419	0	1882
Q Serve(g_s), s	0.0	0.0	0.0	3.2	0.0	0.0	14.3	0.0	3.2	1.1	0.0	0.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.2	0.0	0.0	14.5	0.0	3.2	3.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.64
Lane Grp Cap(c), veh/h	475	1017	873	600	1109	985	420	0	383	365	0	428
V/C Ratio(X)	0.03	0.60	0.03	0.26	0.68	0.02	0.66	0.00	0.21	0.07	0.00	0.05
Avail Cap(c_a), veh/h	475	1017	873	640	1109	985	436	0	402	381	0	449
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)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.0	0.0	0.0	29.6	0.0	25.5	26.5	0.0	24.4
Incr Delay (d2), s/veh	0.1	2.6	0.1	0.2	2.6	0.0	3.4	0.0	0.3	0.1	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(95%),veh/ln	0.0	1.3	0.0	1.5	1.4	0.0	9.1	0.0	2.3	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.1	2.6	0.1	6.2	2.6	0.0	33.0	0.0	25.8	26.5	0.0	24.5
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	645			927			357			46		
Approach Delay, s/veh	2.4			3.1			31.3			25.5		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	11.1	45.8	23.1			56.9	23.1					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2	* 18					
Max Q Clear Time (g_c+I1), s	5.7	2.5	6.3			2.5	17.0					
Green Ext Time (p_c), s	0.1	0.7	0.1			0.9	0.2					

Intersection Summary

HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	414	1	10	732	72	9	2	1	41	3	110
Future Volume (vph)	83	414	1	10	732	72	9	2	1	41	3	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.241			0.509				0.723		0.750		
Satd. Flow (perm)	425	1729	0	850	1818	1561	0	1368	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			116	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	437	0	11	771	76	0	12	0	43	119	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	64.0	64.2		55.4	55.4	55.4		9.2		9.2	9.2	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.20	0.32		0.02	0.61	0.07		0.08		0.28	0.43	
Control Delay	3.5	5.5		4.7	11.2	0.6		30.1		36.1	12.3	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0		0.0	0.0	
Total Delay	3.5	5.5		4.7	11.2	0.6		30.1		36.1	12.3	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		5.1			10.2			30.1			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	10	104		1	278	0		5		20	1	
Queue Length 95th (ft)	m17	188		m3	425	m1		20		48	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	441	1386		588	1258	1114		229		227	348	
Starvation Cap Reductn	0	0		0	39	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	0.20	0.32		0.02	0.63	0.07		0.05		0.19	0.34	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 65.2%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2022 Existing
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	414	1	10	732	72	9	2	1	41	3	110
Future Volume (veh/h)	83	414	1	10	732	72	9	2	1	41	3	110
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	87	436	1	11	771	67	9	2	0	43	3	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	589	1344	3	728	1343	1147	112	19	0	204	5	109
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.06	0.07	0.00	0.07	0.07	0.06
Sat Flow, veh/h	1629	1678	4	919	1935	1652	410	257	0	1375	74	1470
Grp Volume(v), veh/h	87	0	437	11	771	67	11	0	0	43	0	63
Grp Sat Flow(s),veh/h/ln	1629	0	1682	919	1935	1652	667	0	0	1375	0	1544
Q Serve(g_s), s	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	1.9	0.0	3.2
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.95
Lane Grp Cap(c), veh/h	589	0	1347	728	1343	1147	123	0	0	204	0	114
V/C Ratio(X)	0.15	0.00	0.32	0.02	0.57	0.06	0.09	0.00	0.00	0.21	0.00	0.55
Avail Cap(c_a), veh/h	639	0	1347	728	1343	1147	254	0	0	332	0	259
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)	0.65	0.00	0.65	0.79	0.79	0.79	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	35.0	0.0	0.0	35.2	0.0	36.2
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.4	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.0	0.0	0.4	0.0	0.0	1.5	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.1	0.0	0.4	0.0	1.4	0.1	35.3	0.0	0.0	35.7	0.0	40.3
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	524			849			11			106		
Approach Delay, s/veh	0.7			1.3			35.3			38.4		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.5	60.9		10.5		69.5		10.5				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.5	2.5		5.2		2.5		5.2				
Green Ext Time (p_c), s	0.0	1.1		0.2		0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				4.0								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	378	21	40	632	20	90	32	29	26	41	82
Future Volume (vph)	46	378	21	40	632	20	90	32	29	26	41	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1708	0	1573	1680	0	1572	1597	0	0	1802	0
Flt Permitted	0.337			0.497			0.563				0.933	
Satd. Flow (perm)	586	1708	0	822	1680	0	931	1597	0	0	1696	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			3			31			83	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	420	0	42	686	0	95	65	0	0	156	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	56.7	56.7		56.7	56.7		13.4	13.4			13.4	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.17	0.17			0.17	
v/c Ratio	0.12	0.35		0.07	0.58		0.61	0.22			0.44	
Control Delay	1.2	1.4		5.1	9.1		46.5	17.9			17.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.2	1.4		5.1	9.1		46.5	17.9			17.9	
LOS	A	A		A	A		D	B			B	
Approach Delay		1.4			8.9			34.9			17.9	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	7		5	139		45	15			32	
Queue Length 95th (ft)	2	9		19	298		86	44			78	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	415	1212		582	1191		314	559			627	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	12		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.12	0.35		0.07	0.58		0.30	0.12			0.25	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 67.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)	 Ø4
48 s	32 s
 Ø6 (R)	 Ø8
48 s	32 s

HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2022 Existing
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	378	21	40	632	20	90	32	29	26	41	82
Future Volume (veh/h)	46	378	21	40	632	20	90	32	29	26	41	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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	48	398	21	42	665	19	95	34	13	27	43	65
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	519	1213	64	819	1385	40	232	143	55	83	82	103
Arrive On Green	1.00	1.00	1.00	0.75	0.75	0.74	0.12	0.12	0.11	0.11	0.12	0.11
Sat Flow, veh/h	697	1608	85	967	1836	52	1200	1175	449	237	670	843
Grp Volume(v), veh/h	48	0	419	42	0	684	95	0	47	135	0	0
Grp Sat Flow(s),veh/h/ln	697	0	1692	967	0	1888	1200	0	1624	1750	0	0
Q Serve(g_s), s	1.1	0.0	0.0	0.9	0.0	11.2	0.5	0.0	2.1	3.2	0.0	0.0
Cycle Q Clear(g_c), s	12.3	0.0	0.0	0.9	0.0	11.2	6.3	0.0	2.1	5.9	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.03	1.00		0.28	0.20		0.48
Lane Grp Cap(c), veh/h	519	0	1277	819	0	1425	232	0	198	245	0	0
V/C Ratio(X)	0.09	0.00	0.33	0.05	0.00	0.48	0.41	0.00	0.24	0.55	0.00	0.00
Avail Cap(c_a), veh/h	519	0	1277	819	0	1425	491	0	548	615	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(l)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.1	0.0	0.0	2.5	0.0	3.8	33.6	0.0	31.9	33.7	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.7	0.1	0.0	1.2	1.2	0.0	0.6	1.9	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(95%),veh/ln	0.1	0.0	0.4	0.2	0.0	4.9	3.2	0.0	1.5	4.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.5	0.0	0.7	2.6	0.0	4.9	34.8	0.0	32.5	35.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	467			726			142			135		
Approach Delay, s/veh	0.7			4.8			34.0			35.6		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	65.3			14.7			65.3			14.7		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			7.9			13.2			8.3		
Green Ext Time (p_c), s	12.4			0.4			18.5			0.4		

Intersection Summary

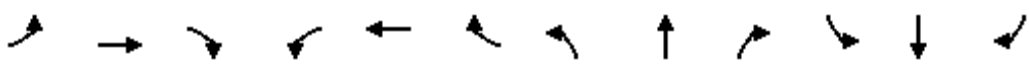
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	524	0	120	254	133	0	0	211	46
Future Volume (vph)	0	0	0	524	0	120	254	133	0	0	211	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.426					
Satd. Flow (perm)	0	0	0	0	1653	1414	712	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	552	126	267	140	0	0	222	48
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					24.0	24.0	28.9	28.9			15.8	15.8
Actuated g/C Ratio					0.38	0.38	0.46	0.46			0.25	0.25
v/c Ratio					0.87	0.20	0.60	0.20			0.53	0.09
Control Delay					35.0	2.8	18.1	11.4			25.8	0.3
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					35.0	2.8	18.1	11.4			25.8	0.3
LOS					D	A	B	B			C	A
Approach Delay					29.0			15.8			21.3	
Approach LOS					C			B			C	
Queue Length 50th (ft)					193	0	65	31			75	0
Queue Length 95th (ft)					#366	21	115	62			136	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					679	670	442	731			454	552
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					0.81	0.19	0.60	0.19			0.49	0.09

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 62.4

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 23.5

Intersection LOS: C

Intersection Capacity Utilization 113.1%

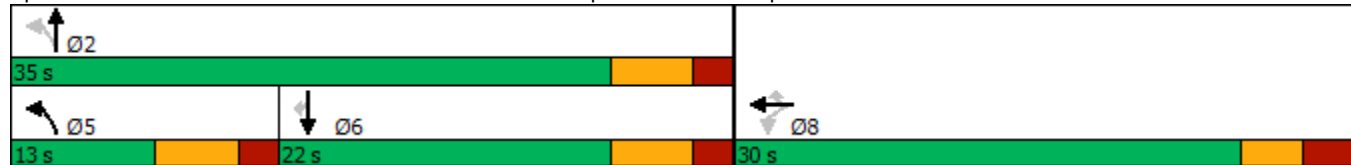
ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing
PM Peak Hour

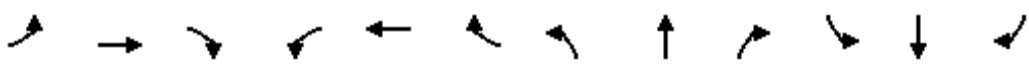
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	524	0	120	254	133	0	0	211	46
Future Volume (veh/h)	0	0	0	524	0	120	254	133	0	0	211	46
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				552	0	0	267	140	0	0	222	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				658	0		495	731	0	0	414	
Arrive On Green				0.35	0.00	0.00	0.14	0.46	0.00	0.00	0.23	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				552	0	0	267	140	0	0	222	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				16.0	0.0	0.0	6.4	2.9	0.0	0.0	6.1	0.0
Cycle Q Clear(g_c), s				16.0	0.0	0.0	6.4	2.9	0.0	0.0	6.1	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				658	0		495	731	0	0	414	
V/C Ratio(X)				0.84	0.00		0.54	0.19	0.00	0.00	0.54	
Avail Cap(c_a), veh/h				810	0		495	844	0	0	541	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.7	0.0	0.0	12.5	8.9	0.0	0.0	19.0	0.0
Incr Delay (d2), s/veh				6.6	0.0	0.0	1.2	0.5	0.0	0.0	3.9	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
%ile BackOfQ(95%),veh/ln				11.5	0.0	0.0	3.7	1.6	0.0	0.0	4.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.3	0.0	0.0	13.7	9.4	0.0	0.0	22.8	0.0
LnGrp LOS				C	A		B	A	A	A	C	
Approach Vol, veh/h					552			407			222	
Approach Delay, s/veh					23.3			12.2			22.8	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		25.2				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		24.5				
Max Q Clear Time (g_c+I1), s		4.9			8.4	8.1		18.0				
Green Ext Time (p_c), s		2.7			0.0	2.1		1.7				
Intersection Summary												
HCM 6th Ctrl Delay				19.4								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2022 Existing

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	3	461	0	0	0	0	349	407	96	646	0
Future Volume (vph)	42	3	461	0	0	0	0	349	407	96	646	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1564	1569	0	0	0	0	1663	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1564	1569	0	0	0	0	1663	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	475	0	0	0	0	780	0	99	666	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 113.1%

ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2022 Existing
PM Peak Hour

Intersection												
Int Delay, s/veh	13.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	42	3	461	0	0	0	0	349	407	96	646	0
Future Vol, veh/h	42	3	461	0	0	0	0	349	407	96	646	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	43	3	475	0	0	0	0	360	420	99	666	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1224	1224	666	-	0	0	360	0	0
Stage 1	864	864	-	-	-	-	-	-	-
Stage 2	360	360	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	189	222	511	0	-	-	905	-	0
Stage 1	487	432	-	0	-	-	-	-	0
Stage 2	798	669	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	168	0	511	-	-	-	905	-	-
Mov Cap-2 Maneuver	168	0	-	-	-	-	-	-	-
Stage 1	487	0	-	-	-	-	-	-	-
Stage 2	711	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	51.2	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	168	511	905	-
HCM Lane V/C Ratio	-	-	0.276	0.93	0.109	-
HCM Control Delay (s)	-	-	34.4	52.8	9.5	-
HCM Lane LOS	-	-	D	F	A	-
HCM 95th %tile Q(veh)	-	-	1.1	11.3	0.4	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2022 Existing
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	741	1081	10
Future Volume (vph)	3	9	8	741	1081	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1800	1781	0
Flt Permitted	0.988			0.999		
Satd. Flow (perm)	1631	0	0	1800	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	772	1124	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	67.5%			ICU Level of Service C		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2022 Existing
PM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	741	1081	10
Future Vol, veh/h	3	9	8	741	1081	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	764	1114	10

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1899	1119	1124	0	-	0
Stage 1	1119	-	-	-	-	-
Stage 2	780	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	82	263	547	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	507	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	80	263	547	-	-	-
Mov Cap-2 Maneuver	80	-	-	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	507	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.3	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	547	-	167	-	-
HCM Lane V/C Ratio	0.015	-	0.074	-	-
HCM Control Delay (s)	11.7	0	28.3	-	-
HCM Lane LOS	B	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	33	68	9	40	35	46	535	13	48	779	267
Future Volume (vph)	185	33	68	9	40	35	46	535	13	48	779	267
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1691	0	1416	1704	0	1620	1693	0	1628	1678	0
Flt Permitted	0.706			0.688			0.106			0.388		
Satd. Flow (perm)	1204	1691	0	1026	1704	0	181	1693	0	665	1678	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		72			37			4			55	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	195	107	0	9	79	0	48	577	0	51	1101	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	11.8	11.8		11.8	11.8		37.7	37.7		37.7	37.7	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.63	0.63		0.63	0.63	
v/c Ratio	0.83	0.27		0.04	0.22		0.42	0.54		0.12	1.03	
Control Delay	54.1	11.3		20.2	14.3		23.0	13.2		5.5	48.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	54.1	11.3		20.2	14.3		23.0	13.2		5.5	48.4	
LOS	D	B		C	B		C	B		A	D	
Approach Delay		39.0			14.9			13.9			46.5	
Approach LOS		D			B			B			D	
Queue Length 50th (ft)	68	10		3	13		19	239		6	~381	
Queue Length 95th (ft)	#168	46		13	43		m44	286		18	#652	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	395		205	370		114	1065		417	1074	
Starvation Cap Reductn	0	0		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	0.81	0.27		0.04	0.21		0.42	0.54		0.12	1.03	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 34.8

Intersection LOS: C

Intersection Capacity Utilization 86.7%

ICU Level of Service E

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2022 Existing
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	33	68	9	40	35	46	535	13	48	779	267
Future Volume (veh/h)	185	33	68	9	40	35	46	535	13	48	779	267
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	195	35	48	9	42	23	48	563	13	51	820	270
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	357	158	216	302	221	121	161	1129	26	425	864	285
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1409	789	1082	1122	1105	605	529	1806	42	872	1383	455
Grp Volume(v), veh/h	195	0	83	9	0	65	48	0	576	51	0	1090
Grp Sat Flow(s),veh/h/ln	1409	0	1871	1122	0	1711	529	0	1847	872	0	1839
Q Serve(g_s), s	8.0	0.0	2.3	0.4	0.0	1.9	4.7	0.0	16.6	2.4	0.0	32.8
Cycle Q Clear(g_c), s	9.9	0.0	2.3	2.7	0.0	1.9	37.5	0.0	16.6	19.0	0.0	32.8
Prop In Lane	1.00		0.58	1.00		0.35	1.00		0.02	1.00		0.25
Lane Grp Cap(c), veh/h	357	0	374	302	0	342	161	0	1155	425	0	1149
V/C Ratio(X)	0.55	0.00	0.22	0.03	0.00	0.19	0.30	0.00	0.50	0.12	0.00	0.95
Avail Cap(c_a), veh/h	357	0	374	302	0	342	161	0	1155	425	0	1149
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.86	0.00	0.86	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.1	0.0	20.3	21.2	0.0	20.1	40.5	0.0	15.5	13.5	0.0	10.5
Incr Delay (d2), s/veh	1.7	0.0	0.3	0.0	0.0	0.3	4.0	0.0	1.3	0.6	0.0	16.8
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(95%),veh/ln	4.7	0.0	1.7	0.2	0.0	1.3	1.7	0.0	12.5	0.9	0.0	19.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.0	20.6	21.3	0.0	20.4	44.5	0.0	16.8	14.1	0.0	27.2
LnGrp LOS	C	A	C	C	A	C	D	A	B	B	A	C
Approach Vol, veh/h	278			74			624			1141		
Approach Delay, s/veh	24.3			20.5			19.0			26.6		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	18.6			11.9			34.8			4.7		
Green Ext Time (p_c), s	11.0			0.0			1.7			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	23.9											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	0	17	60	0	38	16	553	5	10	831	14
Future Volume (vph)	4	0	17	60	0	38	16	553	5	10	831	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1672	0	0	1640	0	0	1722	1648
Flt Permitted		0.775			0.811			0.972			0.993	
Satd. Flow (perm)	0	1348	1581	0	1398	0	0	1596	0	0	1711	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	18	0	103	0	0	604	0	0	886	15
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.6	8.6		8.6			45.2			45.2	45.2
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.02	0.07		0.42			0.50			0.69	0.01
Control Delay		21.0	1.4		18.1			8.5			3.6	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		21.0	1.4		18.1			8.5			3.6	0.0
LOS		C	A		B			A			A	A
Approach Delay		4.9			18.1			8.5			3.5	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)		1	0		16			209			19	0
Queue Length 95th (ft)		8	3		52			192			m28	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		235	322		290			1201			1287	1251
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		0.02	0.06		0.36			0.50			0.69	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 6.3

Intersection LOS: A

Intersection Capacity Utilization 71.3%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	17	60	0	38	16	553	5	10	831	14
Future Volume (veh/h)	4	0	17	60	0	38	16	553	5	10	831	14
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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	4	0	10	63	0	25	17	582	5	11	875	14
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	275	0	151	199	0	38	74	1225	10	65	1368	1233
Arrive On Green	0.08	0.00	0.10	0.08	0.00	0.08	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1632	0	1586	1013	0	402	17	1641	14	6	1832	1652
Grp Volume(v), veh/h	4	0	10	88	0	0	604	0	0	886	0	14
Grp Sat Flow(s),veh/h/ln	1632	0	1586	1415	0	0	1672	0	0	1838	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	0.0	0.3	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.72		0.28	0.03		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	248	0	151	214	0	0	1282	0	0	1402	0	1233
V/C Ratio(X)	0.02	0.00	0.07	0.41	0.00	0.00	0.47	0.00	0.00	0.63	0.00	0.01
Avail Cap(c_a), veh/h	355	0	278	330	0	0	1282	0	0	1402	0	1233
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	25.1	0.0	24.7	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	1.3	0.0	0.0	1.2	0.0	0.0	0.2	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(95%),veh/ln	0.1	0.0	0.2	2.3	0.0	0.0	0.8	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	0.0	24.9	28.0	0.0	0.0	1.2	0.0	0.0	0.2	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	14			88			604			900		
Approach Delay, s/veh	25.0			28.0			1.2			0.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.8			10.2			49.8			10.2		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.3			2.0			5.7		
Green Ext Time (p_c), s	18.8			0.0			28.2			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	2.3											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	270	54	22	279	127	86	268	17	212	338	284
Future Volume (vph)	213	270	54	22	279	127	86	268	17	212	338	284
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1810	0	1604	1640	1442
Flt Permitted	0.234			0.589			0.464			0.409		
Satd. Flow (perm)	391	1791	1435	938	1697	1577	744	1810	0	691	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		2				293
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	278	56	23	288	131	89	294	0	219	348	293
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	46.9	46.9	46.9	24.8	24.8	24.8	50.9	42.3		60.3	47.0	47.0
Actuated g/C Ratio	0.39	0.39	0.39	0.21	0.21	0.21	0.42	0.35		0.50	0.39	0.39
v/c Ratio	0.69	0.40	0.09	0.12	0.82	0.29	0.24	0.46		0.49	0.54	0.39
Control Delay	36.4	27.0	0.8	37.0	63.8	4.5	19.6	35.1		17.4	27.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	36.4	27.0	0.8	37.0	63.8	4.5	19.6	35.1		17.4	27.4	6.7
LOS	D	C	A	D	E	A	B	D		B	C	A
Approach Delay		28.1			44.8			31.5			17.8	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	117	151	0	15	215	0	35	177		95	158	36
Queue Length 95th (ft)	160	197	4	35	290	30	75	293		155	317	76
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	327	932	795	308	558	625	376	639		456	642	743
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.67	0.30	0.07	0.07	0.52	0.21	0.24	0.46		0.48	0.54	0.39

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 28.0

Intersection LOS: C

Intersection Capacity Utilization 75.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4 (R)
23 s	45 s	20 s	32 s
 Ø6	 Ø7	 Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	270	54	22	279	127	86	268	17	212	338	284
Future Volume (veh/h)	213	270	54	22	279	127	86	268	17	212	338	284
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	220	278	26	23	288	0	89	276	17	219	348	222
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	312	658	562	246	332		444	776	48	521	725	615
Arrive On Green	0.13	0.36	0.36	0.19	0.19	0.00	0.05	0.39	0.38	0.14	0.58	0.58
Sat Flow, veh/h	1736	1823	1557	991	1766	1544	1880	2010	124	1616	1655	1402
Grp Volume(v), veh/h	220	278	26	23	288	0	89	0	293	219	348	222
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	991	1766	1544	1880	0	2134	1616	1655	1402
Q Serve(g_s), s	11.6	13.8	1.3	2.3	19.0	0.0	3.3	0.0	11.7	9.3	14.6	10.0
Cycle Q Clear(g_c), s	11.6	13.8	1.3	2.3	19.0	0.0	3.3	0.0	11.7	9.3	14.6	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	312	658	562	246	332		444	0	823	521	725	615
V/C Ratio(X)	0.70	0.42	0.05	0.09	0.87		0.20	0.00	0.36	0.42	0.48	0.36
Avail Cap(c_a), veh/h	345	950	811	386	581		482	0	823	537	725	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	28.9	24.9	40.5	47.3	0.0	20.0	0.0	26.3	16.7	17.1	16.1
Incr Delay (d2), s/veh	5.7	0.2	0.0	0.1	2.7	0.0	0.2	0.0	1.2	0.5	2.3	1.6
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(95%),veh/ln	8.9	9.8	0.9	1.0	13.1	0.0	2.7	0.0	10.5	5.7	8.9	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	29.1	24.9	40.6	50.0	0.0	20.2	0.0	27.5	17.3	19.4	17.8
LnGrp LOS	D	C	C	D	D		C	A	C	B	B	B
Approach Vol, veh/h	524				311				382			
Approach Delay, s/veh	32.8				49.3				25.8			
Approach LOS	C				D				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.8	28.1	18.9	52.3		48.8	12.6	58.6				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	14.1	21.5	11.8	13.7		16.3	5.8	17.1				
Green Ext Time (p_c), s	0.2	0.1	0.1	1.0		0.1	0.1	2.6				

Intersection Summary

HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2022 Existing
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	458	384	55	37	1
Future Volume (vph)	6	458	384	55	37	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1761	0	1670	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1754	1828	1761	0	1670	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	477	457	0	40	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.1% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	458	384	55	37	1
Future Vol, veh/h	6	458	384	55	37	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	477	400	57	39	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	457	0	0	918	429
Stage 1	-	-	-	429	-
Stage 2	-	-	-	489	-
Critical Hdwy	4.1	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	3	3.1
Pot Cap-1 Maneuver	857	-	-	303	648
Stage 1	-	-	-	715	-
Stage 2	-	-	-	665	-
Platoon blocked, %	-	-	-		
Mov Cap-1 Maneuver	857	-	-	301	648
Mov Cap-2 Maneuver	-	-	-	451	-
Stage 1	-	-	-	710	-
Stage 2	-	-	-	665	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	857	-	-	-	455
HCM Lane V/C Ratio	0.007	-	-	-	0.087
HCM Control Delay (s)	9.2	-	-	-	13.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2022 Existing
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	80	75	4	50	54	32	241	6	83	296	46
Future Volume (vph)	76	80	75	4	50	54	32	241	6	83	296	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1396	0	0	1575	0	0	1665	0	0	1568	0
Flt Permitted		0.984			0.998			0.994			0.990	
Satd. Flow (perm)	0	1396	0	0	1575	0	0	1665	0	0	1568	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	240	0	0	112	0	0	290	0	0	442	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	63.5%											
Analysis Period (min)	15											
ICU Level of Service B												

Intersection

Intersection Delay, s/veh	20.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	76	80	75	4	50	54	32	241	6	83	296	46
Future Vol, veh/h	76	80	75	4	50	54	32	241	6	83	296	46
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	79	83	78	4	52	56	33	251	6	86	308	48
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16.7	11.5	16	28.2
HCM LOS	C	B	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	33%	4%	20%
Vol Thru, %	86%	35%	46%	70%
Vol Right, %	2%	32%	50%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	279	231	108	425
LT Vol	32	76	4	83
Through Vol	241	80	50	296
RT Vol	6	75	54	46
Lane Flow Rate	291	241	112	443
Geometry Grp	1	1	1	1
Degree of Util (X)	0.515	0.48	0.208	0.78
Departure Headway (Hd)	6.375	7.179	6.647	6.34
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	564	501	538	576
Service Time	4.426	5.236	4.716	4.34
HCM Lane V/C Ratio	0.516	0.481	0.208	0.769
HCM Control Delay	16	16.7	11.5	28.2
HCM Lane LOS	C	C	B	D
HCM 95th-tile Q	2.9	2.6	0.8	7.3

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2022 Existing
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↱	↰	
Traffic Volume (vph)	603	81	128	513	87	123
Future Volume (vph)	603	81	128	513	87	123
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1835	0	1761	1958	1577	0
Flt Permitted			0.252		0.980	
Satd. Flow (perm)	1835	0	467	1958	1577	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	10					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	691	0	129	518	212	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	69.0		12.0	81.0	29.0	
Total Split (%)	62.7%		10.9%	73.6%	26.4%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	66.0		79.1	77.9	21.7	
Actuated g/C Ratio	0.60		0.72	0.71	0.20	
v/c Ratio	0.63		0.30	0.37	0.68	
Control Delay	17.5		5.5	6.7	52.4	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	17.5		5.5	6.7	52.4	
LOS	B		A	A	D	
Approach Delay	17.5			6.4	52.4	
Approach LOS	B			A	D	
Queue Length 50th (ft)	303		30	158	137	
Queue Length 95th (ft)	431		m29	m155	218	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2022 Existing
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1105		429	1386	341	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.63		0.30	0.37	0.62	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 17.7

Intersection LOS: B

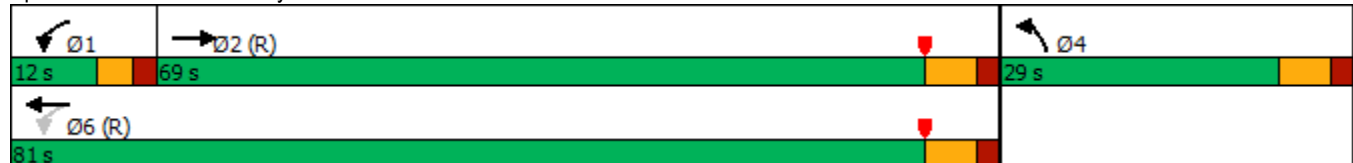
Intersection Capacity Utilization 71.2%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2022 Existing
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	603	81	128	513	87	123
Future Volume (veh/h)	603	81	128	513	87	123
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	609	80	129	518	88	124
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	1001	132	517	1558	110	155
Arrive On Green	0.66	0.65	0.02	0.25	0.16	0.15
Sat Flow, veh/h	1528	201	1927	2090	688	970
Grp Volume(v), veh/h	0	689	129	518	213	0
Grp Sat Flow(s),veh/h/ln	0	1728	1927	2090	1666	0
Q Serve(g_s), s	0.0	25.2	2.1	22.4	13.6	0.0
Cycle Q Clear(g_c), s	0.0	25.2	2.1	22.4	13.6	0.0
Prop In Lane		0.12	1.00		0.41	0.58
Lane Grp Cap(c), veh/h	0	1133	517	1558	267	0
V/C Ratio(X)	0.00	0.61	0.25	0.33	0.80	0.00
Avail Cap(c_a), veh/h	0	1133	553	1558	360	0
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	10.9	8.7	19.0	44.8	0.0
Incr Delay (d2), s/veh	0.0	2.4	0.3	0.6	18.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	14.3	1.4	18.6	11.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	13.3	9.0	19.6	63.2	0.0
LnGrp LOS	A	B	A	B	E	A
Approach Vol, veh/h	689			647	213	
Approach Delay, s/veh	13.3			17.5	63.2	
Approach LOS	B			B	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.9	77.3		22.8		87.2
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	62.8		22.8		74.8
Max Q Clear Time (g_c+I1), s	4.1	27.2		15.6		24.4
Green Ext Time (p_c), s	0.1	19.5		1.1		15.8
Intersection Summary						
HCM 6th Ctrl Delay			21.9			
HCM 6th LOS			C			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	784	0	1	802	99	0	0	1	47	0	35
Future Volume (vph)	16	784	0	1	802	99	0	0	1	47	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	817	0	1	938	0	0	1	0	49	36	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 64.2% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	784	0	1	802	99	0	0	1	47	0	35
Future Vol, veh/h	16	784	0	1	802	99	0	0	1	47	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	17	817	0	1	835	103	0	0	1	49	0	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	938	0	0	817	0	0	1758	1791	817	1741	1740	887
Stage 1	-	-	-	-	-	-	851	851	-	889	889	-
Stage 2	-	-	-	-	-	-	907	940	-	852	851	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	660	-	-	475	-	-	87	100	414	98	117	388
Stage 1	-	-	-	-	-	-	435	417	-	437	422	-
Stage 2	-	-	-	-	-	-	407	383	-	456	437	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	660	-	-	475	-	-	77	97	414	96	114	388
Mov Cap-2 Maneuver	-	-	-	-	-	-	77	97	-	96	114	-
Stage 1	-	-	-	-	-	-	424	406	-	426	421	-
Stage 2	-	-	-	-	-	-	368	382	-	443	426	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	13.7	50.2
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	414	660	-	-	475	-	-	96	388
HCM Lane V/C Ratio	0.003	0.025	-	-	0.002	-	-	0.51	0.094
HCM Control Delay (s)	13.7	10.6	-	-	12.6	-	-	76.3	15.2
HCM Lane LOS	B	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	2.3	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	553	48	150	644	15	251	3	157	34	4	14
Future Volume (vph)	21	553	48	150	644	15	251	3	157	34	4	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1744	0
Flt Permitted	0.403			0.286			0.745			0.549		
Satd. Flow (perm)	700	1783	1584	473	1697	1573	1329	1574	0	1018	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			165			15
Link Speed (mph)		40			40			25				25
Link Distance (ft)		1060			1340			300				300
Travel Time (s)		18.1			22.8			8.2				8.2
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	582	51	158	678	16	264	168	0	36	19	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	59.4	59.4	59.4	75.8	74.5	74.5	24.8	24.8		24.8	24.8	
Actuated g/C Ratio	0.54	0.54	0.54	0.69	0.68	0.68	0.23	0.23		0.23	0.23	
v/c Ratio	0.06	0.60	0.06	0.37	0.59	0.01	0.88	0.35		0.16	0.05	
Control Delay	11.3	15.1	0.2	7.1	8.6	0.4	70.8	7.8		35.4	17.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.3	15.1	0.2	7.1	8.6	0.4	70.8	7.8		35.4	17.4	
LOS	B	B	A	A	A	A	E	A		D	B	
Approach Delay		13.8			8.2			46.3			29.2	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	6	165	0	26	146	0	178	2		20	2	
Queue Length 95th (ft)	m11	213	m0	40	196	m0	#320	55		49	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	378	963	894	500	1149	1074	315	499		241	425	
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	0.06	0.60	0.06	0.32	0.59	0.01	0.84	0.34		0.15	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 18.9

Intersection LOS: B

Intersection Capacity Utilization 84.1%

ICU Level of Service E

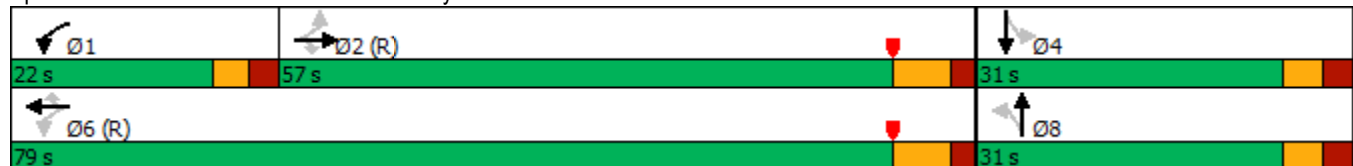
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2022 Existing
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	553	48	150	644	15	251	3	157	34	4	14
Future Volume (veh/h)	21	553	48	150	644	15	251	3	157	34	4	14
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	22	582	29	158	678	11	264	3	100	36	4	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	551	1197	1020	624	1206	1070	374	10	341	290	130	260
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.21	0.21	0.20	0.21	0.21	0.20
Sat Flow, veh/h	830	2047	1743	1666	1736	1540	1489	49	1642	1397	626	1253
Grp Volume(v), veh/h	22	582	29	158	678	11	264	0	103	36	0	12
Grp Sat Flow(s),veh/h/ln	830	2047	1743	1666	1736	1540	1489	0	1691	1397	0	1879
Q Serve(g_s), s	0.0	0.0	0.0	3.9	0.0	0.0	18.8	0.0	5.7	2.4	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.9	0.0	0.0	18.9	0.0	5.7	7.6	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.67
Lane Grp Cap(c), veh/h	551	1197	1020	624	1206	1070	374	0	351	290	0	390
V/C Ratio(X)	0.04	0.49	0.03	0.25	0.56	0.01	0.71	0.00	0.29	0.12	0.00	0.03
Avail Cap(c_a), veh/h	551	1197	1020	774	1206	1070	418	0	401	331	0	446
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)	1.00	1.00	1.00	0.83	0.83	0.83	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.9	0.0	0.0	42.0	0.0	37.2	39.8	0.0	35.0
Incr Delay (d2), s/veh	0.1	1.4	0.1	0.2	1.6	0.0	4.7	0.0	0.5	0.2	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(95%),veh/ln	0.0	0.8	0.0	1.9	1.0	0.0	11.9	0.0	4.4	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.1	1.4	0.1	6.1	1.6	0.0	46.7	0.0	37.6	40.0	0.0	35.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	D
Approach Vol, veh/h	633			847			367			48		
Approach Delay, s/veh	1.3			2.4			44.2			38.7		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	12.1	70.1	27.8			82.2	27.8					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25			72.2	* 25					
Max Q Clear Time (g_c+I1), s	6.4	2.5	10.1			2.5	21.4					
Green Ext Time (p_c), s	0.3	0.7	0.1			0.8	0.5					

Intersection Summary

HCM 6th Ctrl Delay 11.0
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	501	12	4	627	65	9	3	10	60	38	125
Future Volume (vph)	105	501	12	4	627	65	9	3	10	60	38	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1740	0	1744	1818	1561	0	1765	0	1719	1574	0
Flt Permitted	0.308			0.458				0.607		0.742		
Satd. Flow (perm)	543	1740	0	841	1818	1561	0	1092	0	1342	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		11			134	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	552	0	4	674	70	0	24	0	65	175	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	89.1	88.2		75.5	75.5	75.5		11.8		11.8	11.8	
Actuated g/C Ratio	0.81	0.80		0.69	0.69	0.69		0.11		0.11	0.11	
v/c Ratio	0.22	0.40		0.01	0.54	0.06		0.19		0.45	0.61	
Control Delay	3.7	4.5		6.5	12.5	1.8		32.1		54.8	22.3	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	3.7	4.5		6.5	12.8	1.8		32.1		54.8	22.3	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		4.4			11.7			32.1			31.1	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	12	70		1	268	2		8		44	27	
Queue Length 95th (ft)	m30	183		m3	434	9		33		85	92	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	537	1395		577	1248	1096		240		285	440	
Starvation Cap Reductn	0	0		0	137	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	0.21	0.40		0.01	0.61	0.06		0.10		0.23	0.40	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 11.9

Intersection LOS: B

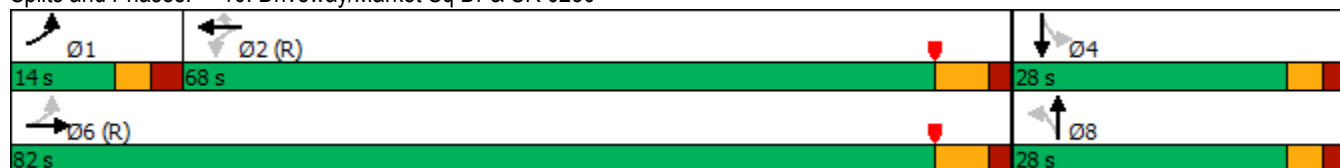
Intersection Capacity Utilization 64.3%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2022 Existing
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	501	12	4	627	65	9	3	10	60	38	125
Future Volume (veh/h)	105	501	12	4	627	65	9	3	10	60	38	125
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	113	539	11	4	674	57	10	3	7	65	41	63
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	625	1353	28	717	1411	1204	67	27	24	188	60	92
Arrive On Green	0.09	1.00	1.00	1.00	1.00	1.00	0.08	0.09	0.08	0.09	0.09	0.08
Sat Flow, veh/h	1629	1657	34	894	1935	1652	191	297	263	1375	651	1000
Grp Volume(v), veh/h	113	0	550	4	674	57	20	0	0	65	0	104
Grp Sat Flow(s),veh/h/ln	1629	0	1691	894	1935	1652	750	0	0	1375	0	1650
Q Serve(g_s), s	1.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	6.7
Cycle Q Clear(g_c), s	1.7	0.0	0.0	0.0	0.0	0.0	6.8	0.0	0.0	5.2	0.0	6.7
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.35	1.00		0.61
Lane Grp Cap(c), veh/h	625	0	1381	717	1411	1204	111	0	0	188	0	152
V/C Ratio(X)	0.18	0.00	0.40	0.01	0.48	0.05	0.18	0.00	0.00	0.35	0.00	0.68
Avail Cap(c_a), veh/h	690	0	1381	717	1411	1204	286	0	0	354	0	351
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	0.90	0.90	0.90	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.3	0.0	0.0	0.0	0.0	0.0	46.4	0.0	0.0	47.7	0.0	48.7
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.0	0.1	0.8	0.0	0.0	1.1	0.0	5.3
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(95%),veh/ln	0.6	0.0	0.5	0.0	0.7	0.0	1.0	0.0	0.0	3.2	0.0	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.4	0.0	0.7	0.0	1.0	0.1	47.1	0.0	0.0	48.8	0.0	54.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	663			735			20			169		
Approach Delay, s/veh	1.0			1.0			47.1			52.0		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.7	85.6	14.7		95.3		14.7					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.2	2.5	8.7		2.5		8.8					
Green Ext Time (p_c), s	0.1	0.9	0.4		0.6		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				7.0								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	479	23	20	512	13	65	23	17	15	20	73
Future Volume (vph)	53	479	23	20	512	13	65	23	17	15	20	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1744	0	1620	1698	0	1541	1660	0	0	1823	0
Flt Permitted	0.429			0.443			0.540				0.951	
Satd. Flow (perm)	746	1744	0	755	1698	0	876	1660	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			18			77	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	528	0	21	553	0	68	42	0	0	114	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.9	86.9		86.9	86.9		13.2	13.2			13.2	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.10	0.38		0.04	0.41		0.65	0.20			0.41	
Control Delay	5.1	6.2		3.5	5.2		72.2	29.2			20.9	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0			0.0	
Total Delay	5.1	6.3		3.5	5.2		72.2	29.2			20.9	
LOS	A	A		A	A		E	C			C	
Approach Delay		6.2			5.1			55.7			20.9	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	11	145		3	97		47	15			24	
Queue Length 95th (ft)	25	188		10	189		91	46			73	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	589	1377		596	1341		326	630			699	
Starvation Cap Reductn	0	213		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	0.10	0.45		0.04	0.41		0.21	0.07			0.16	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 10.9

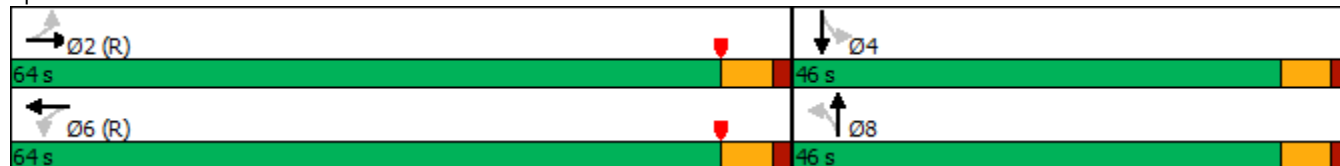
Intersection LOS: B

Intersection Capacity Utilization 67.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

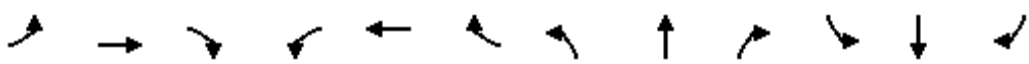
13: Sheaffer Rd & SR 0230

2022 Existing
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	479	23	20	512	13	65	23	17	15	20	73
Future Volume (veh/h)	53	479	23	20	512	13	65	23	17	15	20	73
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	56	504	19	21	539	13	68	24	6	16	21	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	673	1391	52	818	1556	38	169	98	25	62	50	58
Arrive On Green	1.00	1.00	1.00	0.84	0.84	0.83	0.07	0.07	0.06	0.06	0.07	0.06
Sat Flow, veh/h	788	1662	63	899	1859	45	1246	1351	338	294	689	797
Grp Volume(v), veh/h	56	0	523	21	0	552	68	0	30	67	0	0
Grp Sat Flow(s),veh/h/ln	788	0	1724	899	0	1904	1246	0	1689	1779	0	0
Q Serve(g_s), s	0.7	0.0	0.0	0.4	0.0	7.3	0.8	0.0	1.8	1.9	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	0.4	0.0	7.3	4.7	0.0	1.8	4.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	1.00		0.20	0.24		0.45
Lane Grp Cap(c), veh/h	673	0	1444	818	0	1594	169	0	123	154	0	0
V/C Ratio(X)	0.08	0.00	0.36	0.03	0.00	0.35	0.40	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	673	0	1444	818	0	1594	542	0	630	675	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)	0.92	0.00	0.92	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.3	0.0	0.0	1.5	0.0	2.1	49.4	0.0	48.2	49.4	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.1	0.0	0.6	1.6	0.0	1.0	1.9	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	2.8	3.4	0.0	1.5	3.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	0.0	0.7	1.6	0.0	2.7	51.0	0.0	49.2	51.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	579			573			98			67		
Approach Delay, s/veh	0.6			2.6			50.4			51.3		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	97.0			13.0			97.0			13.0		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.0			9.3			6.7		
Green Ext Time (p_c), s	18.8			0.2			19.9			0.3		
Intersection Summary												
HCM 6th Ctrl Delay			7.8									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	332	1	58	202	111	0	0	125	27
Future Volume (vph)	0	0	0	332	1	58	202	111	0	0	125	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1642	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.953		0.497					
Satd. Flow (perm)	0	0	0	0	1642	1442	823	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	347	60	210	116	0	0	130	28
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.4	16.4	27.3	27.3			14.1	14.1
Actuated g/C Ratio					0.31	0.31	0.51	0.51			0.26	0.26
v/c Ratio					0.69	0.11	0.39	0.14			0.28	0.05
Control Delay					24.0	0.4	10.7	8.4			18.5	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					24.0	0.4	10.7	8.4			18.5	0.2
LOS					C	A	B	A			B	A
Approach Delay					20.5			9.9			15.3	
Approach LOS					C			A			B	
Queue Length 50th (ft)					90	0	35	18			33	0
Queue Length 95th (ft)					180	0	77	44			74	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					637	660	534	932			560	613
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					0.54	0.09	0.39	0.12			0.23	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 53.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 15.7

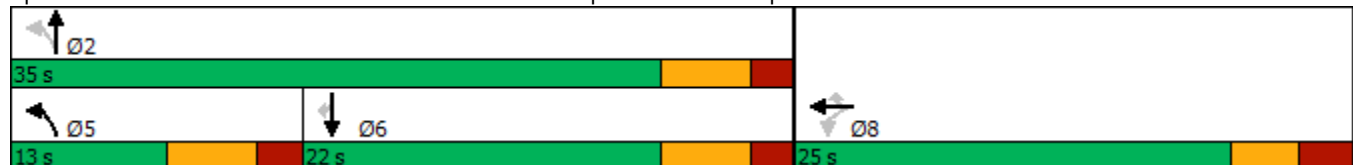
Intersection LOS: B

Intersection Capacity Utilization 53.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2022 Existing
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	332	1	58	202	111	0	0	125	27
Future Volume (veh/h)	0	0	0	332	1	58	202	111	0	0	125	27
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				346	1	0	210	116	0	0	130	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				471	1		664	916	0	0	507	
Arrive On Green				0.24	0.26	0.00	0.16	0.54	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1780	5	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				347	0	0	210	116	0	0	130	0
Grp Sat Flow(s),veh/h/ln				1786	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				8.5	0.0	0.0	3.7	1.6	0.0	0.0	2.6	0.0
Cycle Q Clear(g_c), s				8.5	0.0	0.0	3.7	1.6	0.0	0.0	2.6	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				472	0		664	916	0	0	507	
V/C Ratio(X)				0.74	0.00		0.32	0.13	0.00	0.00	0.26	
Avail Cap(c_a), veh/h				768	0		679	1075	0	0	664	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.5	0.0	0.0	7.8	5.5	0.0	0.0	13.6	0.0
Incr Delay (d2), s/veh				2.2	0.0	0.0	0.3	0.2	0.0	0.0	1.0	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
%ile BackOfQ(95%),veh/ln				6.2	0.0	0.0	1.7	0.7	0.0	0.0	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.7	0.0	0.0	8.1	5.7	0.0	0.0	14.5	0.0
LnGrp LOS				B	A		A	A	A	A	B	
Approach Vol, veh/h					347			326			130	
Approach Delay, s/veh					18.7			7.3			14.5	
Approach LOS					B			A			B	
Timer - Assigned Phs	2			5		6	8					
Phs Duration (G+Y+Rc), s	30.6			12.6		18.0	17.1					
Change Period (Y+Rc), s	6.0			6.0		6.0	5.5					
Max Green Setting (Gmax), s	29.0			7.0		16.0	19.5					
Max Q Clear Time (g_c+I1), s	3.6			5.7		4.6	10.5					
Green Ext Time (p_c), s	2.2			0.1		1.5	1.2					
Intersection Summary												
HCM 6th Ctrl Delay	13.4											
HCM 6th LOS	B											

Lanes, Volumes, Timings

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2022 Existing

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	205	0	0	0	0	282	340	85	374	0
Future Volume (vph)	23	0	205	0	0	0	0	282	340	85	374	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	220	0	0	0	0	669	0	91	402	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 53.7%

ICU Level of Service A

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2022 Existing
SAT Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	23	0	205	0	0	0	0	282	340	85	374	0
Future Vol, veh/h	23	0	205	0	0	0	0	282	340	85	374	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	25	0	220	0	0	0	0	303	366	91	402	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	887	887	402	-	0	0	303	0	0
Stage 1	584	584	-	-	-	-	-	-	-
Stage 2	303	303	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	327	331	709	0	-	-	978	-	0
Stage 1	664	553	-	0	-	-	-	-	0
Stage 2	871	702	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	297	0	709	-	-	-	978	-	-
Mov Cap-2 Maneuver	297	0	-	-	-	-	-	-	-
Stage 1	664	0	-	-	-	-	-	-	-
Stage 2	790	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	297	709	978	-
HCM Lane V/C Ratio	-	-	0.083	0.311	0.093	-
HCM Control Delay (s)	-	-	18.2	12.4	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	1.3	0.3	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2022 Existing
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	13	596	594	3
Future Volume (vph)	6	11	13	596	594	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1796	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1796	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	648	635	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	51.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2022 Existing
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	13	596	594	3
Future Vol, veh/h	6	11	13	596	594	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	14	634	632	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1296	634	635	0	-	0
Stage 1	634	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	178	506	777	-	-	-
Stage 1	552	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	173	506	777	-	-	-
Mov Cap-2 Maneuver	173	-	-	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	534	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.7	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	777	-	301	-	-
HCM Lane V/C Ratio	0.018	-	0.06	-	-
HCM Control Delay (s)	9.7	0	17.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	23	52	11	21	32	29	440	8	19	419	177
Future Volume (vph)	149	23	52	11	21	32	29	440	8	19	419	177
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1685	0	1572	1636	0	1620	1710	0	1550	1685	0
Flt Permitted	0.720			0.706			0.358			0.464		
Satd. Flow (perm)	1228	1685	0	1168	1636	0	610	1710	0	757	1685	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			34			2			60	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	79	0	12	56	0	31	471	0	20	627	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.7	12.7		12.4	12.4		40.5	40.5		40.5	40.5	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.68	0.68		0.68	0.68	
v/c Ratio	0.60	0.20		0.05	0.15		0.08	0.41		0.04	0.54	
Control Delay	31.2	9.8		17.9	11.0		5.5	7.9		5.8	8.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.2	9.8		17.9	11.0		5.5	7.9		5.8	8.8	
LOS	C	A		B	B		A	A		A	A	
Approach Delay		24.0			12.3			7.7			8.7	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)	50	7		3	6		4	83		3	112	
Queue Length 95th (ft)	101	34		14	29		m16	193		10	212	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	307	462		292	434		411	1155		511	1157	
Starvation Cap Reductn	0	0		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	0.51	0.17		0.04	0.13		0.08	0.41		0.04	0.54	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 58.8%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2022 Existing
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	23	52	11	21	32	29	440	8	19	419	177
Future Volume (veh/h)	149	23	52	11	21	32	29	440	8	19	419	177
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	157	24	28	12	22	20	31	463	7	20	441	152
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	344	154	179	314	155	141	525	1190	18	520	891	307
Arrive On Green	0.18	0.18	0.16	0.18	0.18	0.16	0.21	0.21	0.21	0.65	0.65	0.63
Sat Flow, veh/h	1439	869	1014	1265	878	798	842	1836	28	927	1375	474
Grp Volume(v), veh/h	157	0	52	12	0	42	31	0	470	20	0	593
Grp Sat Flow(s),veh/h/ln	1439	0	1883	1265	0	1676	842	0	1864	927	0	1849
Q Serve(g_s), s	6.2	0.0	1.4	0.5	0.0	1.3	1.9	0.0	13.0	0.8	0.0	10.1
Cycle Q Clear(g_c), s	7.5	0.0	1.4	1.9	0.0	1.3	11.9	0.0	13.0	13.7	0.0	10.1
Prop In Lane	1.00		0.54	1.00		0.48	1.00		0.01	1.00		0.26
Lane Grp Cap(c), veh/h	344	0	333	314	0	297	525	0	1208	520	0	1199
V/C Ratio(X)	0.46	0.00	0.16	0.04	0.00	0.14	0.06	0.00	0.39	0.04	0.00	0.49
Avail Cap(c_a), veh/h	449	0	471	406	0	419	525	0	1208	520	0	1199
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.94	0.00	0.94	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.0	0.0	21.1	21.7	0.0	21.0	17.3	0.0	13.4	9.9	0.0	5.6
Incr Delay (d2), s/veh	0.9	0.0	0.2	0.0	0.0	0.2	0.2	0.0	0.9	0.1	0.0	1.5
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(95%),veh/ln	3.6	0.0	1.1	0.2	0.0	0.9	0.8	0.0	10.4	0.3	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	0.0	21.3	21.8	0.0	21.3	17.5	0.0	14.3	10.0	0.0	7.0
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	A
Approach Vol, veh/h	209			54			501			613		
Approach Delay, s/veh	24.1			21.4			14.5			7.1		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.4			15.6			44.4			15.6		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	15.0			9.5			12.1			3.9		
Green Ext Time (p_c), s	9.3			0.3			13.2			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	12.9											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	23	0	7	15	468	7	11	487	7
Future Volume (vph)	5	1	12	23	0	7	15	468	7	11	487	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1698	0	0	1668	0	0	1722	1648
Flt Permitted					0.986			0.982			0.988	
Satd. Flow (perm)	0	1740	1581	0	1739	0	0	1641	0	0	1703	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	31	0	0	516	0	0	525	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.12			0.35			0.35	0.00
Control Delay		23.5	0.5		5.0			2.8			1.5	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.5		5.0			2.8			1.5	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.8			5.0			2.8			1.4	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		12			102			13	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		377			1455			1510	1466
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		0.02	0.04		0.08			0.35			0.35	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 2.3

Intersection LOS: A

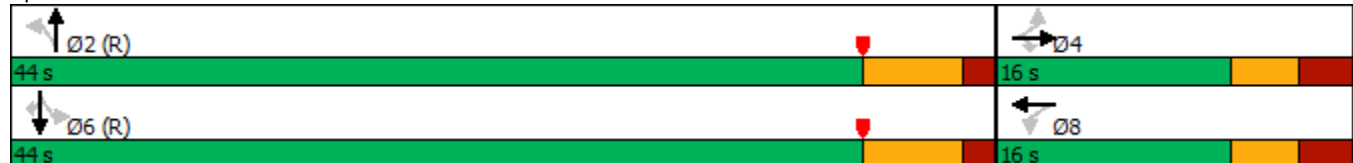
Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2022 Existing
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	23	0	7	15	468	7	11	487	7
Future Volume (veh/h)	5	1	12	23	0	7	15	468	7	11	487	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	24	0	3	16	493	7	12	513	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	171	12	69	161	0	6	77	1332	19	71	1454	1319
Arrive On Green	0.03	0.04	0.04	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1397	279	1586	1109	0	139	18	1669	23	12	1822	1652
Grp Volume(v), veh/h	6	0	6	27	0	0	516	0	0	525	0	7
Grp Sat Flow(s),veh/h/ln	1676	0	1586	1248	0	0	1711	0	0	1833	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	1.3	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.89		0.11	0.03		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	155	0	69	147	0	0	1399	0	0	1494	0	1319
V/C Ratio(X)	0.04	0.00	0.09	0.18	0.00	0.00	0.37	0.00	0.00	0.35	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1399	0	0	1494	0	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.83	0.00	0.83
Uniform Delay (d), s/veh	28.0	0.0	27.6	28.7	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.5	0.6	0.0	0.0	0.7	0.0	0.0	0.5	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(95%),veh/ln	0.2	0.0	0.2	0.7	0.0	0.0	0.9	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	0.0	28.1	29.3	0.0	0.0	2.5	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	12			27			516			532		
Approach Delay, s/veh	28.1			29.3			2.5			0.5		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	52.9			7.1			52.9			7.1		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	7.2			2.2			2.0			3.3		
Green Ext Time (p_c), s	14.0			0.0			15.6			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	284	54	26	305	133	69	161	14	124	170	177
Future Volume (vph)	199	284	54	26	305	133	69	161	14	124	170	177
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1845	0	1558	1624	1499
Flt Permitted	0.290			0.582			0.648			0.588		
Satd. Flow (perm)	480	1809	1435	935	1731	1592	1184	1845	0	964	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		5				247
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1025			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	203	290	55	27	311	136	70	178	0	127	173	181
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	30.0	30.0	30.0	16.2	16.2	16.2	18.8	12.9		20.1	15.8	15.8
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.29	0.20		0.31	0.24	0.24
v/c Ratio	0.57	0.35	0.07	0.12	0.73	0.23	0.17	0.48		0.34	0.44	0.33
Control Delay	20.8	14.8	0.2	23.1	36.0	0.9	14.6	28.7		16.9	27.4	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	20.8	14.8	0.2	23.1	36.0	0.9	14.6	28.7		16.9	27.4	3.0
LOS	C	B	A	C	D	A	B	C		B	C	A
Approach Delay		15.6			25.2			24.8			15.4	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	54	79	0	9	123	0	18	66		34	67	0
Queue Length 95th (ft)	#111	148	0	29	#244	0	42	124		70	127	20
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	359	916	806	274	507	646	413	514		373	486	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.57	0.32	0.07	0.10	0.61	0.21	0.17	0.35		0.34	0.36	0.29

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 65.3

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 19.5

Intersection LOS: B

Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2022 Existing
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	284	54	26	305	133	69	161	14	124	170	177
Future Volume (veh/h)	199	284	54	26	305	133	69	161	14	124	170	177
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	203	290	49	27	311	0	70	164	11	127	173	99
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	419	832	705	340	401		369	274	18	373	299	264
Arrive On Green	0.14	0.45	0.45	0.22	0.22	0.00	0.07	0.14	0.12	0.11	0.18	0.18
Sat Flow, veh/h	1723	1837	1557	968	1794	1557	2069	2025	136	1576	1641	1450
Grp Volume(v), veh/h	203	290	49	27	311	0	70	0	175	127	173	99
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	968	1794	1557	2069	0	2161	1576	1641	1450
Q Serve(g_s), s	4.7	6.0	1.0	1.3	9.5	0.0	1.6	0.0	4.5	3.9	5.6	3.5
Cycle Q Clear(g_c), s	4.7	6.0	1.0	1.3	9.5	0.0	1.6	0.0	4.5	3.9	5.6	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	419	832	705	340	401		369	0	293	373	299	264
V/C Ratio(X)	0.48	0.35	0.07	0.08	0.78		0.19	0.00	0.60	0.34	0.58	0.37
Avail Cap(c_a), veh/h	422	1005	852	429	568		517	0	647	411	491	434
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.4	10.4	9.0	18.1	21.3	0.0	19.4	0.0	23.8	18.1	21.9	21.0
Incr Delay (d2), s/veh	0.9	0.1	0.0	0.0	2.5	0.0	0.2	0.0	2.0	0.5	1.8	0.9
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(95%),veh/ln	2.7	3.3	0.5	0.5	6.6	0.0	1.4	0.0	4.2	2.3	3.7	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	10.5	9.1	18.2	23.9	0.0	19.6	0.0	25.8	18.7	23.6	21.9
LnGrp LOS	B	B	A	B	C		B	A	C	B	C	C
Approach Vol, veh/h	542			338			245			399		
Approach Delay, s/veh	11.8			23.4			24.0			21.6		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.4	18.6	12.6	13.9		32.0	9.8	16.7				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	7.2	12.0	6.4	6.5		8.5	4.1	8.1				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.5		0.1	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes

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

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2022 Existing
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	48	32	15	32	46	19	172	7	24	175	33
Future Volume (vph)	37	48	32	15	32	46	19	172	7	24	175	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1679	0	0	1633	0	0	1770	0	0	1850	0
Flt Permitted		0.984			0.992			0.995			0.995	
Satd. Flow (perm)	0	1679	0	0	1633	0	0	1770	0	0	1850	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	0	97	0	0	206	0	0	241	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.3%											
Analysis Period (min)	15											
	ICU Level of Service A											

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

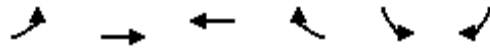
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	37	48	32	15	32	46	19	172	7	24	175	33
Future Vol, veh/h	37	48	32	15	32	46	19	172	7	24	175	33
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	39	50	33	16	33	48	20	179	7	25	182	34
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	8.7	9.7	9.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	32%	16%	10%
Vol Thru, %	87%	41%	34%	75%
Vol Right, %	4%	27%	49%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	198	117	93	232
LT Vol	19	37	15	24
Through Vol	172	48	32	175
RT Vol	7	32	46	33
Lane Flow Rate	206	122	97	242
Geometry Grp	1	1	1	1
Degree of Util (X)	0.276	0.173	0.131	0.311
Departure Headway (Hd)	4.811	5.109	4.853	4.63
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	743	697	732	771
Service Time	2.871	3.18	2.926	2.687
HCM Lane V/C Ratio	0.277	0.175	0.133	0.314
HCM Control Delay	9.7	9.3	8.7	9.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.1	0.6	0.4	1.3

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2022 Existing
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	382	416	33	31	3
Future Volume (vph)	3	382	416	33	31	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1793	0	1658	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1793	0	1658	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	398	467	0	35	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 33.9% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	382	416	33	31	3
Future Vol, veh/h	3	382	416	33	31	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	398	433	34	32	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	467	0	-	0	854	450
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	404	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	851	-	-	-	334	629
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	851	-	-	-	333	629
Mov Cap-2 Maneuver	-	-	-	-	478	-
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	737	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	851	-	-	-	488	
HCM Lane V/C Ratio	0.004	-	-	-	0.073	
HCM Control Delay (s)	9.2	-	-	-	13	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

APPENDIX L2

2024 NO BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	399	78	80	356	142	138
Future Volume (vph)	399	78	80	356	142	138
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1681	0	1662	1766	1535	0
Flt Permitted			0.262		0.975	
Satd. Flow (perm)	1681	0	458	1766	1535	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	17					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	530	0	89	396	311	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.7		42.4	41.2	18.4	
Actuated g/C Ratio	0.45		0.61	0.59	0.26	
v/c Ratio	0.69		0.22	0.38	0.77	
Control Delay	22.2		5.2	6.4	39.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	22.2		5.2	6.4	39.0	
LOS	C		A	A	D	
Approach Delay	22.2			6.2	39.0	
Approach LOS	C			A	D	
Queue Length 50th (ft)	182		11	55	123	
Queue Length 95th (ft)	#319		m22	79	#239	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	771		415	1040	412	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.69		0.21	0.38	0.75	

Intersection Summary

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 20.3	Intersection LOS: C
Intersection Capacity Utilization 61.2%	ICU Level of Service B
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	34 s	24 s
↖ Ø6 (R)		
46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2024 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	399	78	80	356	142	138
Future Volume (veh/h)	399	78	80	356	142	138
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	443	81	89	396	158	153
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	658	120	452	1186	194	188
Arrive On Green	0.49	0.47	0.15	1.00	0.24	0.22
Sat Flow, veh/h	1355	248	1846	1927	825	799
Grp Volume(v), veh/h	0	524	89	396	312	0
Grp Sat Flow(s),veh/h/ln	0	1603	1846	1927	1628	0
Q Serve(g_s), s	0.0	17.5	1.4	0.0	12.7	0.0
Cycle Q Clear(g_c), s	0.0	17.5	1.4	0.0	12.7	0.0
Prop In Lane		0.15	1.00		0.51	0.49
Lane Grp Cap(c), veh/h	0	778	452	1186	384	0
V/C Ratio(X)	0.00	0.67	0.20	0.33	0.81	0.00
Avail Cap(c_a), veh/h	0	778	528	1186	437	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.8	8.5	0.0	25.5	0.0
Incr Delay (d2), s/veh	0.0	4.6	0.2	0.8	15.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	10.6	0.8	0.4	10.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.5	8.7	0.8	40.6	0.0
LnGrp LOS	A	B	A	A	D	A
Approach Vol, veh/h	524			485	312	
Approach Delay, s/veh	18.5			2.2	40.6	
Approach LOS	B			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.1	39.2		21.7		48.3
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.4	19.5		14.7		2.0
Green Ext Time (p_c), s	0.1	5.0		0.8		10.2
Intersection Summary						
HCM 6th Ctrl Delay			17.7			
HCM 6th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	565	1	0	529	40	0	0	2	40	0	34
Future Volume (vph)	25	565	1	0	529	40	0	0	2	40	0	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	636	0	0	639	0	0	2	0	45	38	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 46.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	565	1	0	529	40	0	0	2	40	0	34
Future Vol, veh/h	25	565	1	0	529	40	0	0	2	40	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	28	635	1	0	594	45	0	0	2	45	0	38
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	639	0	0	636	0	0	1329	1331	637	1311	1309	618
Stage 1	-	-	-	-	-	-	692	692	-	617	617	-
Stage 2	-	-	-	-	-	-	637	639	-	694	692	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	756	-	-	585	-	-	167	181	428	185	200	484
Stage 1	-	-	-	-	-	-	528	484	-	598	537	-
Stage 2	-	-	-	-	-	-	564	508	-	547	503	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	756	-	-	585	-	-	149	174	428	179	193	484
Mov Cap-2 Maneuver	-	-	-	-	-	-	149	174	-	179	193	-
Stage 1	-	-	-	-	-	-	508	466	-	576	537	-
Stage 2	-	-	-	-	-	-	519	508	-	524	484	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0			13.5			23.2		
HCM LOS							B			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2			
Capacity (veh/h)	428	756	-	-	585	-	-	179	484			
HCM Lane V/C Ratio	0.005	0.037	-	-	-	-	-	0.251	0.079			
HCM Control Delay (s)	13.5	9.9	-	-	0	-	-	31.7	13.1			
HCM Lane LOS	B	A	-	-	A	-	-	D	B			
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1	0.3			

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	477	44	62	460	6	101	2	71	4	3	2
Future Volume (vph)	3	477	44	62	460	6	101	2	71	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.475			0.350			0.754			0.704		
Satd. Flow (perm)	826	1667	1552	568	1558	1608	1302	1516	0	1305	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45			79			2
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	530	49	69	511	7	112	81	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	44.6	44.6	44.6	52.3	52.1	52.1	10.8	10.8		10.6	10.6	
Actuated g/C Ratio	0.64	0.64	0.64	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.50	0.05	0.13	0.44	0.01	0.56	0.27		0.02	0.02	
Control Delay	6.7	7.8	0.1	1.5	3.0	0.0	38.3	9.8		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	7.8	0.1	1.5	3.0	0.0	38.3	9.8		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		7.2			2.8			26.3			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	81	0	7	59	0	44	1		1	1	
Queue Length 95th (ft)	m1	m115	m0	2	11	m0	92	34		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	526	1062	1036	542	1160	1208	225	327		225	320	
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	0.01	0.50	0.05	0.13	0.44	0.01	0.50	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.1

Intersection LOS: A

Intersection Capacity Utilization 64.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	477	44	62	460	6	101	2	71	4	3	2
Future Volume (veh/h)	3	477	44	62	460	6	101	2	71	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	530	33	69	511	6	112	2	41	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	699	1191	1053	663	1169	1121	279	9	194	256	142	94
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	974	1947	1722	1640	1609	1542	1460	78	1609	1470	1175	784
Grp Volume(v), veh/h	3	530	33	69	511	6	112	0	43	4	0	5
Grp Sat Flow(s),veh/h/ln	974	1947	1722	1640	1609	1542	1460	0	1688	1470	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	5.1	0.0	1.6	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.9	0.0	0.0	5.1	0.0	1.6	1.3	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.40
Lane Grp Cap(c), veh/h	699	1191	1053	663	1169	1121	279	0	203	256	0	236
V/C Ratio(X)	0.00	0.45	0.03	0.10	0.44	0.01	0.40	0.00	0.21	0.02	0.00	0.02
Avail Cap(c_a), veh/h	699	1191	1053	779	1169	1121	355	0	292	333	0	339
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)	1.00	1.00	1.00	0.93	0.93	0.93	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.2	0.0	0.0	29.3	0.0	28.2	28.2	0.0	27.3
Incr Delay (d2), s/veh	0.0	1.2	0.1	0.1	1.1	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.7	0.0	0.3	0.6	0.0	3.3	0.0	1.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.2	0.1	3.3	1.1	0.0	30.3	0.0	28.7	28.2	0.0	27.4
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	566			586			155			9		
Approach Delay, s/veh	1.1			1.3			29.8			27.7		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.1	48.6	13.3		56.7		13.3					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.4	2.5	3.8		2.5		7.6					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.8
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	404	13	5	496	12	9	0	14	6	0	8
Future Volume (vph)	25	404	13	5	496	12	9	0	14	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1659	0	1744	1654	1445	0	1729	0	1719	1501	0
Flt Permitted	0.395			0.504				0.866				
Satd. Flow (perm)	697	1659	0	925	1654	1415	0	1526	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				126		139			416	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	448	0	5	533	13	0	25	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.30		0.01	0.39	0.01		0.09		0.03	0.02	
Control Delay	0.9	2.3		3.8	5.1	0.0		0.7		28.5	0.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.9	2.3		3.8	5.1	0.0		0.7		28.5	0.0	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.2			4.9			0.7			11.4	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m2	64		m2	177	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	694	1492		773	1383	1204		325		242	561	
Starvation Cap Reductn	0	0		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	0.04	0.30		0.01	0.39	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 3.7

Intersection LOS: A

Intersection Capacity Utilization 44.0%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2024 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	404	13	5	496	12	9	0	14	6	0	8
Future Volume (veh/h)	25	404	13	5	496	12	9	0	14	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	27	434	14	5	533	13	10	0	14	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	725	1285	41	813	1298	1125	89	0	22	159	68	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1567	51	981	1793	1554	426	0	596	1361	1837	0
Grp Volume(v), veh/h	27	0	448	5	533	13	24	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1617	981	1793	1554	1021	0	0	1361	1837	0
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.42		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	725	0	1326	813	1298	1125	96	0	0	159	68	0
V/C Ratio(X)	0.04	0.00	0.34	0.01	0.41	0.01	0.25	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	824	0	1326	813	1298	1125	241	0	0	291	247	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(l)	0.86	0.00	0.86	0.93	0.93	0.93	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	0.0	0.0	0.0	0.0	0.0	34.0	0.0	0.0	32.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.0	0.9	0.0	1.3	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.4	0.0	0.6	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.6	0.0	0.9	0.0	35.3	0.0	0.0	32.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	475		551				24		6			
Approach Delay, s/veh	0.6		0.9				35.3		32.7			
Approach LOS	A		A				D		C			
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	6.7	56.1	7.2			62.8		7.2				
Change Period (Y+Rc), s	5.5	6.4	5.6			6.4		5.6				
Max Green Setting (Gmax), s	5.5	38.6	8.4			49.6		8.4				
Max Q Clear Time (g_c+I1), s	2.7	2.5	2.7			2.5		3.6				
Green Ext Time (p_c), s	0.0	0.6	0.0			0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	1.7											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	374	1	10	400	24	59	26	35	28	15	46
Future Volume (vph)	37	374	1	10	400	24	59	26	35	28	15	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1591	0	1248	1497	0	0	1793	0
Flt Permitted	0.482			0.517			0.772				0.869	
Satd. Flow (perm)	855	1685	0	678	1591	0	1014	1497	0	0	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			38			49	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	403	0	11	456	0	63	66	0	0	95	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.5	52.5		52.5	52.5		10.9	10.9			10.9	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.06	0.32		0.02	0.38		0.40	0.25			0.33	
Control Delay	1.1	1.5		4.4	5.8		32.9	15.5			17.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.5		4.4	5.8		32.9	15.5			17.0	
LOS	A	A		A	A		C	B			B	
Approach Delay		1.5			5.8			24.0			17.0	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	7		1	64		25	11			18	
Queue Length 95th (ft)	3	17		7	143		55	39			52	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	640	1262		508	1194		289	454			487	
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	0.06	0.32		0.02	0.38		0.22	0.15			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 7.1

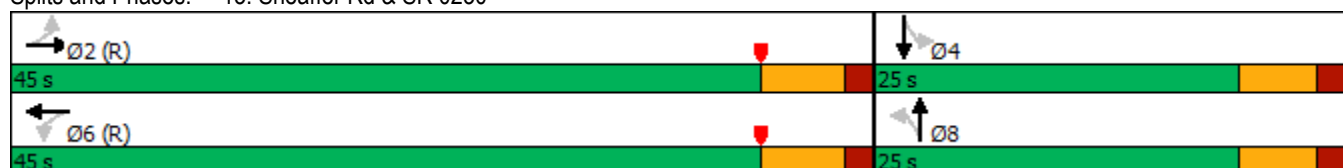
Intersection LOS: A

Intersection Capacity Utilization 52.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2024 No Build
AM Peak Hour

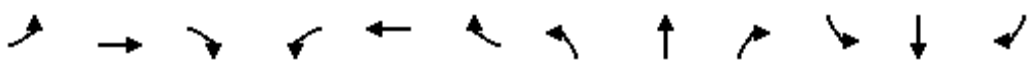
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	374	1	10	400	24	59	26	35	28	15	46
Future Volume (veh/h)	37	374	1	10	400	24	59	26	35	28	15	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	40	402	0	11	430	25	63	28	16	30	16	31
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	701	1281	0	698	1304	76	216	97	55	114	43	58
Arrive On Green	1.00	1.00	0.00	0.76	0.76	0.75	0.10	0.10	0.08	0.08	0.10	0.08
Sat Flow, veh/h	876	1680	0	780	1709	99	1002	1009	577	440	450	600
Grp Volume(v), veh/h	40	402	0	11	0	455	63	0	44	77	0	0
Grp Sat Flow(s),veh/h/ln	876	1680	0	780	0	1809	1002	0	1586	1491	0	0
Q Serve(g_s), s	0.4	0.0	0.0	0.2	0.0	5.6	0.0	0.0	1.8	1.9	0.0	0.0
Cycle Q Clear(g_c), s	6.0	0.0	0.0	0.2	0.0	5.6	3.2	0.0	1.8	3.7	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.05	1.00		0.36	0.39		0.40
Lane Grp Cap(c), veh/h	701	1281	0	698	0	1380	216	0	152	193	0	0
V/C Ratio(X)	0.06	0.31	0.00	0.02	0.00	0.33	0.29	0.00	0.29	0.40	0.00	0.00
Avail Cap(c_a), veh/h	701	1281	0	698	0	1380	406	0	453	508	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(l)	0.96	0.96	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.3	0.0	0.0	2.0	0.0	2.6	30.1	0.0	29.6	30.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.6	0.0	0.0	0.0	0.6	0.7	0.0	1.0	1.3	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(95%),veh/ln	0.1	0.4	0.0	0.0	0.0	1.8	1.8	0.0	1.3	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	0.6	0.0	2.0	0.0	3.3	30.8	0.0	30.6	32.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	442		466			107			77			
Approach Delay, s/veh	0.6		3.3			30.7			32.0			
Approach LOS	A		A			C			C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	58.3		11.7		58.3		11.7					
Change Period (Y+Rc), s	* 5.9		6.0		* 5.9		6.0					
Max Green Setting (Gmax), s	* 39		19.0		* 39		19.0					
Max Q Clear Time (g_c+I1), s	2.0		5.7		7.6		5.2					
Green Ext Time (p_c), s	11.5		0.1		12.8		0.3					
Intersection Summary												
HCM 6th Ctrl Delay			6.9									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	321	0	87	520	137	0	0	186	56
Future Volume (vph)	0	0	0	321	0	87	520	137	0	0	186	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.479					
Satd. Flow (perm)	0	0	0	0	1546	1145	778	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	334	91	542	143	0	0	194	58
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					15.6	15.6	32.6	32.6			15.6	15.6
Actuated g/C Ratio					0.27	0.27	0.56	0.56			0.27	0.27
v/c Ratio					0.80	0.21	0.90	0.18			0.47	0.11
Control Delay					37.0	1.9	32.9	7.0			22.3	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					37.0	1.9	32.9	7.0			22.3	0.4
LOS					D	A	C	A			C	A
Approach Delay					29.5			27.5			17.3	
Approach LOS					C			C			B	
Queue Length 50th (ft)					111	0	116	22			57	0
Queue Length 95th (ft)					#232	7	#313	45			110	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					443	444	599	840			450	558
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					0.75	0.20	0.90	0.17			0.43	0.10

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 57.8

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 26.2

Intersection LOS: C

Intersection Capacity Utilization 86.5%

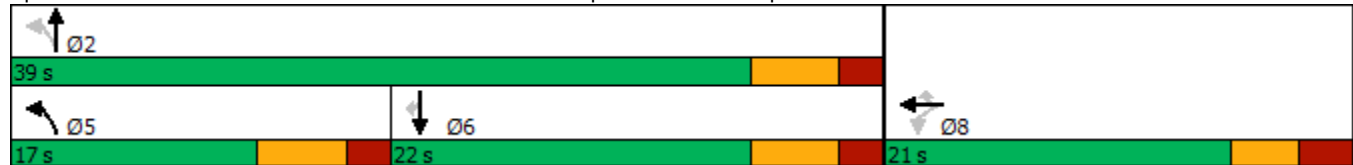
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	321	0	87	520	137	0	0	186	56
Future Volume (veh/h)	0	0	0	321	0	87	520	137	0	0	186	56
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				334	0	0	542	143	0	0	194	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				435	0		669	852	0	0	413	
Arrive On Green				0.22	0.00	0.00	0.23	0.57	0.00	0.00	0.25	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				334	0	0	542	143	0	0	194	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				9.2	0.0	0.0	12.0	2.4	0.0	0.0	5.2	0.0
Cycle Q Clear(g_c), s				9.2	0.0	0.0	12.0	2.4	0.0	0.0	5.2	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				435	0		669	852	0	0	413	
V/C Ratio(X)				0.77	0.00		0.81	0.17	0.00	0.00	0.47	
Avail Cap(c_a), veh/h				564	0		669	965	0	0	541	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.9	0.0	0.0	10.6	5.2	0.0	0.0	16.7	0.0
Incr Delay (d2), s/veh				4.7	0.0	0.0	7.4	0.3	0.0	0.0	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
%ile BackOfQ(50%),veh/ln				4.1	0.0	0.0	4.4	0.5	0.0	0.0	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.6	0.0	0.0	18.0	5.6	0.0	0.0	19.7	0.0
LnGrp LOS				C	A		B	A	A	A	B	
Approach Vol, veh/h					334			685			194	
Approach Delay, s/veh					23.6			15.4			19.7	
Approach LOS					C			B			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		17.2				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		4.4			14.0	7.2		11.2				
Green Ext Time (p_c), s		3.1			0.0	2.0		0.7				
Intersection Summary												
HCM 6th Ctrl Delay				18.3								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	2	236	0	0	0	0	625	563	106	392	0
Future Volume (vph)	31	2	236	0	0	0	0	625	563	106	392	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	35	251	0	0	0	0	1264	0	113	417	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 86.5% ICU Level of Service E

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2024 No Build
AM Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	31	2	236	0	0	0	0	625	563	106	392	0
Future Vol, veh/h	31	2	236	0	0	0	0	625	563	106	392	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	33	2	251	0	0	0	0	665	599	113	417	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1308	1308	417	-	0	0	665	0	0
Stage 1	643	643	-	-	-	-	-	-	-
Stage 2	665	665	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	170	200	673	0	-	-	729	-	0
Stage 1	624	525	-	0	-	-	-	-	0
Stage 2	610	515	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	144	0	673	-	-	-	729	-	-
Mov Cap-2 Maneuver	144	0	-	-	-	-	-	-	-
Stage 1	624	0	-	-	-	-	-	-	-
Stage 2	515	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	144	673	729	-
HCM Lane V/C Ratio	-	-	0.244	0.373	0.155	-
HCM Control Delay (s)	-	-	37.9	13.5	10.8	-
HCM Lane LOS	-	-	E	B	B	-
HCM 95th %tile Q(veh)	-	-	0.9	1.7	0.5	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 No Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	24	0	1171	620	5
Future Volume (vph)	6	24	0	1171	620	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1624	0	0	1734	1653	0
Flt Permitted	0.990					
Satd. Flow (perm)	1624	0	0	1734	1653	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	0	0	1301	695	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	71.6%			ICU Level of Service C		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 No Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	24	0	1171	620	5
Future Vol, veh/h	6	24	0	1171	620	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	27	0	1301	689	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1993	692	695	0	-	0
Stage 1	692	-	-	-	-	-
Stage 2	1301	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	71	468	745	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	279	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	71	468	745	-	-	-
Mov Cap-2 Maneuver	71	-	-	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	279	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	24.2	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	745	-	221	-	-	
HCM Lane V/C Ratio	-	-	0.151	-	-	
HCM Control Delay (s)	0	-	24.2	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0.5	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	19	88	8	12	74	31	761	8	10	498	149
Future Volume (vph)	336	19	88	8	12	74	31	761	8	10	498	149
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1575	0	1391	1565	0	1500	1615	0	1628	1573	0
Flt Permitted	0.695			0.681			0.245			0.152		
Satd. Flow (perm)	1173	1575	0	996	1565	0	387	1615	0	260	1573	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		98			82			1			35	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	373	119	0	9	95	0	34	855	0	11	719	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.11	0.23		0.03	0.19		0.16	0.94		0.08	0.80	
Control Delay	111.4	7.6		18.6	7.4		7.7	30.1		8.5	20.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	111.4	7.6		18.6	7.4		7.7	30.1		8.5	20.1	
LOS	F	A		B	A		A	C		A	C	
Approach Delay		86.3			8.4			29.3			19.9	
Approach LOS		F			A			C			B	
Queue Length 50th (ft)	~188	7		3	4		4	320		2	212	
Queue Length 95th (ft)	#343	42		13	35		m9	#567		9	#434	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 No Build
AM Peak Hour

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	335	520		284	505		218	911		146	902	
Starvation Cap Reductn	0	0		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	1.11	0.23		0.03	0.19		0.16	0.94		0.08	0.80	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 37.9

Intersection LOS: D

Intersection Capacity Utilization 77.9%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

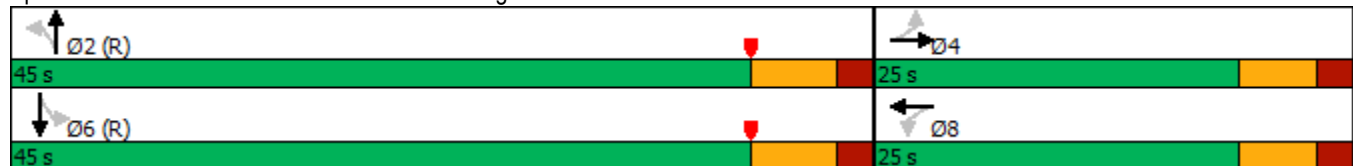
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2024 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	19	88	8	12	74	31	761	8	10	498	149
Future Volume (veh/h)	336	19	88	8	12	74	31	761	8	10	498	149
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	373	21	98	9	13	82	34	846	9	11	553	166
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	423	91	423	352	58	363	282	994	11	482	753	226
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1360	317	1479	1065	201	1270	705	1762	19	673	1334	401
Grp Volume(v), veh/h	373	0	119	9	0	95	34	0	855	11	0	719
Grp Sat Flow(s),veh/h/ln	1360	0	1796	1065	0	1472	705	0	1780	673	0	1735
Q Serve(g_s), s	16.5	0.0	3.6	0.5	0.0	3.5	2.0	0.0	0.0	0.5	0.0	21.7
Cycle Q Clear(g_c), s	20.0	0.0	3.6	4.1	0.0	3.5	23.7	0.0	0.0	0.5	0.0	21.7
Prop In Lane	1.00		0.82	1.00		0.86	1.00		0.01	1.00		0.23
Lane Grp Cap(c), veh/h	423	0	513	352	0	420	282	0	1005	482	0	979
V/C Ratio(X)	0.88	0.00	0.23	0.03	0.00	0.23	0.12	0.00	0.85	0.02	0.00	0.73
Avail Cap(c_a), veh/h	423	0	513	352	0	420	282	0	1005	482	0	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.75	0.00	0.75	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	19.5	20.7	0.0	19.4	6.5	0.0	0.0	6.8	0.0	11.5
Incr Delay (d2), s/veh	18.9	0.0	0.2	0.0	0.0	0.3	0.7	0.0	7.0	0.1	0.0	4.9
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	8.3	0.0	1.4	0.1	0.0	1.1	0.2	0.0	1.9	0.1	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	19.7	20.7	0.0	19.7	7.1	0.0	7.0	6.8	0.0	16.3
LnGrp LOS	D	A	B	C	A	B	A	A	A	A	A	B
Approach Vol, veh/h	492			104			889			730		
Approach Delay, s/veh	40.3			19.8			7.0			16.2		
Approach LOS	D			B			A			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			23.7			6.1		
Green Ext Time (p_c), s	27.7			0.0			11.5			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	18.0											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	16	16	1	9	2	764	7	24	547	7
Future Volume (vph)	35	0	16	16	1	9	2	764	7	24	547	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1682	0	0	1561	0	0	1615	1648
Flt Permitted		0.740			0.787			0.999			0.958	
Satd. Flow (perm)	0	1288	1581	0	1366	0	0	1559	0	0	1550	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		9			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	17	0	27	0	0	805	0	0	595	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		8.6	8.6		8.5			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.23	0.07		0.16			0.62			0.46	0.01
Control Delay		30.4	2.4		22.5			7.2			8.0	0.4
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		30.4	2.4		22.5			7.2			8.0	0.4
LOS		C	A		C			A			A	A
Approach Delay		21.5			22.5			7.2			7.9	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		14	0		7			138			160	0
Queue Length 95th (ft)		38	4		27			309			m259	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		230	320		251			1301			1294	1382
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		0.16	0.05		0.11			0.62			0.46	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 8.3

Intersection LOS: A

Intersection Capacity Utilization 68.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

											
Ø2 (R)									Ø4		
53 s									17 s		
											
Ø6 (R)									Ø8		
53 s									17 s		

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	16	16	1	9	2	764	7	24	547	7
Future Volume (veh/h)	35	0	16	16	1	9	2	764	7	24	547	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	36	0	17	17	1	9	2	796	7	25	570	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	205	0	101	119	8	21	52	1296	11	78	1331	1322
Arrive On Green	0.05	0.00	0.06	0.05	0.06	0.05	0.79	0.80	0.79	1.00	1.00	1.00
Sat Flow, veh/h	1601	0	1586	545	120	333	1	1619	14	30	1663	1652
Grp Volume(v), veh/h	36	0	17	27	0	0	805	0	0	595	0	7
Grp Sat Flow(s),veh/h/ln	1601	0	1586	998	0	0	1634	0	0	1693	0	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.7	2.4	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.63		0.33	0.00		0.01	0.04		1.00
Lane Grp Cap(c), veh/h	182	0	101	133	0	0	1336	0	0	1385	0	1322
V/C Ratio(X)	0.20	0.00	0.17	0.20	0.00	0.00	0.60	0.00	0.00	0.43	0.00	0.01
Avail Cap(c_a), veh/h	337	0	283	302	0	0	1336	0	0	1385	0	1322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.52	0.00	0.52
Uniform Delay (d), s/veh	31.8	0.0	31.0	32.5	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	0.7	0.0	0.0	2.0	0.0	0.0	0.5	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	0.6	0.0	0.3	0.5	0.0	0.0	2.1	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	0.0	31.8	33.3	0.0	0.0	4.8	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	53			27			805			602		
Approach Delay, s/veh	32.2			33.3			4.8			0.5		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	61.0			9.0			61.0			9.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	47.0			11.5			47.0			11.5		
Max Q Clear Time (g_c+I1), s	15.8			3.4			2.0			4.4		
Green Ext Time (p_c), s	22.5			0.1			20.7			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	4.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	190	37	3	173	198	72	359	11	106	226	205
Future Volume (vph)	262	190	37	3	173	198	72	359	11	106	226	205
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1716	0	1500	1509	1388
Flt Permitted	0.427			0.631			0.545			0.290		
Satd. Flow (perm)	668	1660	1088	792	1649	1561	939	1716	0	457	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		2				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	279	202	39	3	184	211	77	394	0	113	240	218
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	29.8	29.8	29.8	14.5	14.5	14.5	26.1	20.1		26.2	20.2	20.2
Actuated g/C Ratio	0.41	0.41	0.41	0.20	0.20	0.20	0.36	0.28		0.36	0.28	0.28
v/c Ratio	0.72	0.30	0.07	0.02	0.56	0.42	0.19	0.82		0.40	0.57	0.39
Control Delay	31.1	17.4	0.3	25.0	35.0	5.6	13.5	41.8		17.3	29.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	31.1	17.4	0.3	25.0	35.0	5.6	13.5	41.8		17.3	29.8	5.4
LOS	C	B	A	C	C	A	B	D		B	C	A
Approach Delay		23.4			19.3			37.2			18.0	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	98	66	0	1	81	0	19	168		28	94	0
Queue Length 95th (ft)	#195	114	0	8	143	39	47	#340		64	179	44

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	385	774	587	201	419	575	418	522		283	459	584
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.72	0.26	0.07	0.01	0.44	0.37	0.18	0.75		0.40	0.52	0.37

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.2

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 24.3

Intersection LOS: C

Intersection Capacity Utilization 71.3%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	262	190	37	3	173	198	72	359	11	106	226	205
Future Volume (veh/h)	262	190	37	3	173	198	72	359	11	106	226	205
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	279	202	26	3	184	0	77	382	10	113	240	188
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	439	703	496	262	330		375	477	12	305	409	362
Arrive On Green	0.14	0.41	0.41	0.19	0.19	0.00	0.06	0.24	0.22	0.09	0.27	0.27
Sat Flow, veh/h	1641	1709	1206	819	1724	1532	1988	2005	52	1522	1528	1352
Grp Volume(v), veh/h	279	202	26	3	184	0	77	0	392	113	240	188
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	819	1724	1532	1988	0	2058	1522	1528	1352
Q Serve(g_s), s	8.9	5.4	0.9	0.2	6.6	0.0	1.9	0.0	12.2	3.7	9.3	8.1
Cycle Q Clear(g_c), s	8.9	5.4	0.9	0.2	6.6	0.0	1.9	0.0	12.2	3.7	9.3	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	439	703	496	262	330		375	0	490	305	409	362
V/C Ratio(X)	0.64	0.29	0.05	0.01	0.56		0.21	0.00	0.80	0.37	0.59	0.52
Avail Cap(c_a), veh/h	439	826	583	321	454		479	0	648	340	481	426
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	13.4	12.1	22.4	25.0	0.0	17.7	0.0	24.5	17.6	21.7	21.3
Incr Delay (d2), s/veh	3.0	0.1	0.0	0.0	0.5	0.0	0.3	0.0	5.3	0.7	1.3	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	3.2	1.8	0.2	0.0	2.5	0.0	0.9	0.0	6.4	1.2	3.2	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	13.5	12.1	22.4	25.5	0.0	17.9	0.0	29.8	18.3	23.1	22.4
LnGrp LOS	C	B	B	C	C		B	A	C	B	C	C
Approach Vol, veh/h	507				187				469			
Approach Delay, s/veh	17.2				25.5				27.9			
Approach LOS	B				C				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	12.5	22.3		33.6	10.4	24.3				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	11.4	9.1	6.2	14.2		7.9	4.4	11.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0		0.1	0.0	1.5				

Intersection Summary

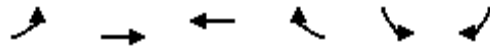
HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2024 No Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	280	375	23	25	3
Future Volume (vph)	3	280	375	23	25	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1723	0	1550	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1723	0	1550	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	308	437	0	30	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.1%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	280	375	23	25	3
Future Vol, veh/h	3	280	375	23	25	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	308	412	25	27	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	437	0	0 739 425
Stage 1	-	-	- - 425 -
Stage 2	-	-	- - 314 -
Critical Hdwy	4.4	-	- - 6.84 6.7
Critical Hdwy Stg 1	-	-	- - 5.84 -
Critical Hdwy Stg 2	-	-	- - 5.84 -
Follow-up Hdwy	3.3	-	- - 3 3.4
Pot Cap-1 Maneuver	776	-	- - 395 583
Stage 1	-	-	- - 715 -
Stage 2	-	-	- - 819 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	776	-	- - 393 583
Mov Cap-2 Maneuver	-	-	- - 525 -
Stage 1	-	-	- - 712 -
Stage 2	-	-	- - 819 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	776	-	-	-	531
HCM Lane V/C Ratio	0.004	-	-	-	0.058
HCM Control Delay (s)	9.7	-	-	-	12.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2024 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	22	33	6	43	110	46	302	9	25	167	72
Future Volume (vph)	62	22	33	6	43	110	46	302	9	25	167	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1307	0	0	1540	0	0	1664	0	0	1509	0
Flt Permitted		0.974			0.998			0.994			0.995	
Satd. Flow (perm)	0	1307	0	0	1540	0	0	1664	0	0	1509	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	0	166	0	0	372	0	0	275	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	53.6%											
Analysis Period (min)	15											
	ICU Level of Service A											

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	62	22	33	6	43	110	46	302	9	25	167	72
Future Vol, veh/h	62	22	33	6	43	110	46	302	9	25	167	72
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	65	23	34	6	45	115	48	315	9	26	174	75
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.9	10.6	15.8	13.4
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	53%	4%	9%
Vol Thru, %	85%	19%	27%	63%
Vol Right, %	3%	28%	69%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	357	117	159	264
LT Vol	46	62	6	25
Through Vol	302	22	43	167
RT Vol	9	33	110	72
Lane Flow Rate	372	122	166	275
Geometry Grp	1	1	1	1
Degree of Util (X)	0.572	0.23	0.257	0.443
Departure Headway (Hd)	5.541	6.805	5.585	5.797
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	651	525	639	619
Service Time	3.588	4.873	3.648	3.849
HCM Lane V/C Ratio	0.571	0.232	0.26	0.444
HCM Control Delay	15.8	11.9	10.6	13.4
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	3.6	0.9	1	2.3

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	650	85	191	488	122	124
Future Volume (vph)	650	85	191	488	122	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1799	0	1744	1958	1583	0
Flt Permitted			0.114		0.976	
Satd. Flow (perm)	1799	0	209	1958	1583	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	12					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	807	0	210	536	270	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	0.87		0.71	0.41	0.81	
Control Delay	29.9		21.9	7.5	51.3	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	29.9		21.9	7.5	51.3	
LOS	C		C	A	D	
Approach Delay	29.9			11.5	51.3	
Approach LOS	C			B	D	
Queue Length 50th (ft)	332		34	120	129	
Queue Length 95th (ft)	#576		m71	m151	#253	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	923		294	1292	332	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.87		0.71	0.41	0.81	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 25.6	Intersection LOS: C
Intersection Capacity Utilization 79.9%	ICU Level of Service D
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	46 s	22 s
↖ Ø6 (R)		
58 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2024 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	650	85	191	488	122	124
Future Volume (veh/h)	650	85	191	488	122	124
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	714	84	210	536	134	136
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	823	97	347	1406	163	165
Arrive On Green	0.54	0.53	0.17	1.00	0.20	0.18
Sat Flow, veh/h	1524	179	1914	2090	825	837
Grp Volume(v), veh/h	0	798	210	536	271	0
Grp Sat Flow(s),veh/h/ln	0	1703	1914	2090	1668	0
Q Serve(g_s), s	0.0	32.5	3.6	0.0	12.5	0.0
Cycle Q Clear(g_c), s	0.0	32.5	3.6	0.0	12.5	0.0
Prop In Lane		0.11	1.00		0.49	0.50
Lane Grp Cap(c), veh/h	0	920	347	1406	329	0
V/C Ratio(X)	0.00	0.87	0.61	0.38	0.82	0.00
Avail Cap(c_a), veh/h	0	920	379	1406	350	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	16.0	14.2	0.0	31.0	0.0
Incr Delay (d2), s/veh	0.0	10.9	2.4	0.8	18.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	19.5	3.4	0.6	10.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	26.8	16.6	0.8	49.8	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	798			746	271	
Approach Delay, s/veh	26.8			5.2	49.8	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.6	48.4		21.0		59.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	5.6	34.5		14.5		2.0
Green Ext Time (p_c), s	0.1	4.5		0.3		16.5
Intersection Summary						
HCM 6th Ctrl Delay			21.4			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	808	0	0	951	84	1	0	2	29	0	48
Future Volume (vph)	27	808	0	0	951	84	1	0	2	29	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	869	0	0	1113	0	0	3	0	31	52	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 66.1% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	808	0	0	951	84	1	0	2	29	0	48
Future Vol, veh/h	27	808	0	0	951	84	1	0	2	29	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	29	869	0	0	1023	90	1	0	2	31	0	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1113	0	0	869	0	0	2022	2040	869	1996	1995	1069
Stage 1	-	-	-	-	-	-	927	927	-	1068	1068	-
Stage 2	-	-	-	-	-	-	1095	1113	-	928	927	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	587	-	-	447	-	-	58	72	388	67	85	308
Stage 1	-	-	-	-	-	-	397	388	-	354	359	-
Stage 2	-	-	-	-	-	-	323	324	-	417	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	587	-	-	447	-	-	46	68	388	64	81	308
Mov Cap-2 Maneuver	-	-	-	-	-	-	46	68	-	64	81	-
Stage 1	-	-	-	-	-	-	378	369	-	337	359	-
Stage 2	-	-	-	-	-	-	269	324	-	394	388	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	38.1	51.8
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	112	587	-	-	447	-	-	64	308
HCM Lane V/C Ratio	0.029	0.049	-	-	-	-	-	0.487	0.168
HCM Control Delay (s)	38.1	11.5	-	-	0	-	-	106	19
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	1.9	0.6

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	612	36	151	750	17	267	3	115	23	8	16
Future Volume (vph)	14	612	36	151	750	17	267	3	115	23	8	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1747	0
Flt Permitted	0.331			0.204			0.741			0.678		
Satd. Flow (perm)	576	1766	1550	338	1697	1608	1316	1576	0	1257	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40			120			17
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	638	38	157	781	18	278	123	0	24	25	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.8	37.8	37.8	51.9	50.6	50.6	18.7	18.7		18.7	18.7	
Actuated g/C Ratio	0.47	0.47	0.47	0.65	0.63	0.63	0.23	0.23		0.23	0.23	
v/c Ratio	0.06	0.76	0.05	0.45	0.73	0.02	0.90	0.27		0.08	0.06	
Control Delay	11.6	16.9	0.2	7.8	6.5	0.1	63.8	7.1		24.6	14.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.6	16.9	0.2	7.8	6.5	0.1	63.8	7.1		24.6	14.4	
LOS	B	B	A	A	A	A	E	A		C	B	
Approach Delay		15.9			6.6			46.4			19.4	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	2	112	0	4	25	0	135	1		9	3	
Queue Length 95th (ft)	m5	m184	m0	m26	53	m0	#273	41		28	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	271	834	792	350	1072	1030	314	467		300	430	
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	0.06	0.76	0.05	0.45	0.73	0.02	0.89	0.26		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 17.6

Intersection LOS: B

Intersection Capacity Utilization 90.2%

ICU Level of Service E

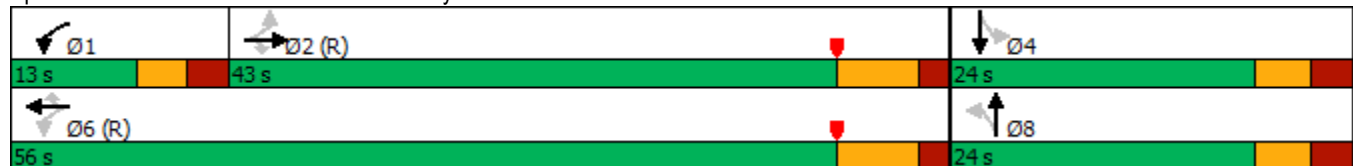
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	612	36	151	750	17	267	3	115	23	8	16
Future Volume (veh/h)	14	612	36	151	750	17	267	3	115	23	8	16
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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	15	638	23	157	781	15	278	3	80	24	8	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	464	1011	868	586	1106	983	422	14	372	366	157	274
Arrive On Green	1.00	1.00	1.00	0.17	1.00	1.00	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	752	2032	1745	1666	1736	1542	1470	61	1624	1418	684	1198
Grp Volume(v), veh/h	15	638	23	157	781	15	278	0	83	24	0	22
Grp Sat Flow(s),veh/h/ln	752	2032	1745	1666	1736	1542	1470	0	1685	1418	0	1882
Q Serve(g_s), s	0.0	0.3	0.0	3.3	0.0	0.0	14.4	0.0	3.2	1.1	0.0	0.7
Cycle Q Clear(g_c), s	0.0	0.3	0.0	3.3	0.0	0.0	14.7	0.0	3.2	3.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.64
Lane Grp Cap(c), veh/h	464	1011	868	586	1106	983	422	0	386	366	0	431
V/C Ratio(X)	0.03	0.63	0.03	0.27	0.71	0.02	0.66	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	464	1011	868	624	1106	983	437	0	402	380	0	449
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(l)	1.00	1.00	1.00	0.73	0.73	0.73	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.1	0.1	0.1	6.1	0.0	0.0	29.6	0.0	25.4	26.4	0.0	24.3
Incr Delay (d2), s/veh	0.1	3.0	0.1	0.2	2.8	0.0	3.5	0.0	0.3	0.1	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(95%),veh/ln	0.0	1.6	0.0	1.5	1.5	0.0	9.2	0.0	2.4	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	3.1	0.1	6.3	2.8	0.0	33.0	0.0	25.7	26.5	0.0	24.4
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	676				953				361			
Approach Delay, s/veh	2.9				3.3				31.3			
Approach LOS	A				A				C			
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	11.2	45.6	23.2			56.8		23.2				
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8		* 5.9				
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2		* 18				
Max Q Clear Time (g_c+I1), s	5.8	2.8	6.3			2.5		17.2				
Green Ext Time (p_c), s	0.1	0.8	0.1			1.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay 8.7
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	441	1	10	755	73	9	2	1	41	3	111
Future Volume (vph)	84	441	1	10	755	73	9	2	1	41	3	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.229			0.496				0.721		0.750		
Satd. Flow (perm)	404	1729	0	828	1818	1561	0	1364	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			117	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	465	0	11	795	77	0	12	0	43	120	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	64.0	64.2		55.4	55.4	55.4		9.2		9.2	9.2	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.21	0.34		0.02	0.63	0.07		0.08		0.28	0.44	
Control Delay	3.5	5.7		4.7	11.4	0.6		30.1		36.1	12.3	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0		0.0	0.0	
Total Delay	3.5	5.7		4.7	11.5	0.6		30.1		36.1	12.3	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		5.4			10.5			30.1			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	10	118		1	294	0		5		20	1	
Queue Length 95th (ft)	m17	m202		m3	403	m1		20		48	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	426	1386		573	1258	1114		229		227	349	
Starvation Cap Reductn	0	0		0	41	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	0.21	0.34		0.02	0.65	0.07		0.05		0.19	0.34	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 9.7

Intersection LOS: A

Intersection Capacity Utilization 66.6%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	51 s	18 s
 Ø5 (R)		 Ø8
62 s		18 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2024 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	441	1	10	755	73	9	2	1	41	3	111
Future Volume (veh/h)	84	441	1	10	755	73	9	2	1	41	3	111
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	88	464	1	11	795	68	9	2	0	43	3	61
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	579	1343	3	711	1341	1145	112	19	0	205	5	110
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.06	0.07	0.00	0.07	0.07	0.06
Sat Flow, veh/h	1629	1678	4	896	1935	1652	406	255	0	1376	72	1472
Grp Volume(v), veh/h	88	0	465	11	795	68	11	0	0	43	0	64
Grp Sat Flow(s),veh/h/ln	1629	0	1682	896	1935	1652	661	0	0	1376	0	1544
Q Serve(g_s), s	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	1.9	0.0	3.2
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.95
Lane Grp Cap(c), veh/h	579	0	1346	711	1341	1145	123	0	0	205	0	116
V/C Ratio(X)	0.15	0.00	0.35	0.02	0.59	0.06	0.09	0.00	0.00	0.21	0.00	0.55
Avail Cap(c_a), veh/h	629	0	1346	711	1341	1145	253	0	0	333	0	259
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(l)	0.59	0.00	0.59	0.76	0.76	0.76	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.9	0.0	0.0	35.1	0.0	36.2
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.5	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.0	0.0	0.4	0.0	0.0	1.5	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.1	0.0	0.4	0.0	1.5	0.1	35.2	0.0	0.0	35.6	0.0	40.3
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	553			874			11			107		
Approach Delay, s/veh	0.7			1.3			35.2			38.4		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.6	60.9		10.6		69.4		10.6				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.5	2.5		5.2		2.5		5.2				
Green Ext Time (p_c), s	0.0	1.1		0.2		0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				3.9								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	390	21	40	644	32	91	35	29	33	43	93
Future Volume (vph)	62	390	21	40	644	32	91	35	29	33	43	93
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1708	0	1573	1677	0	1572	1604	0	0	1801	0
Flt Permitted	0.320			0.487			0.522				0.921	
Satd. Flow (perm)	556	1708	0	806	1677	0	863	1604	0	0	1675	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			5			31			83	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	433	0	42	712	0	96	68	0	0	178	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	56.3	56.3		56.3	56.3		13.8	13.8			13.8	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.17	0.17			0.17	
v/c Ratio	0.17	0.36		0.07	0.60		0.65	0.23			0.50	
Control Delay	1.6	1.4		5.4	9.8		49.7	18.0			20.1	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0			0.0	
Total Delay	1.6	1.4		5.4	9.9		49.7	18.0			20.1	
LOS	A	A		A	A		D	B			C	
Approach Delay		1.5			9.7			36.6			20.1	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)	1	7		5	151		45	16			42	
Queue Length 95th (ft)	3	9		20	327		88	45			91	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	391	1203		567	1181		291	561			620	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	28		0	0			1	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.17	0.36		0.07	0.62		0.33	0.12			0.29	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 82.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)	 Ø4
48 s	32 s
 Ø6 (R)	 Ø8
48 s	32 s

HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2024 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	390	21	40	644	32	91	35	29	33	43	93
Future Volume (veh/h)	62	390	21	40	644	32	91	35	29	33	43	93
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	65	411	21	42	678	32	96	37	13	35	45	77
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	490	1197	61	800	1336	63	232	160	56	92	81	113
Arrive On Green	1.00	1.00	1.00	0.74	0.74	0.73	0.13	0.13	0.12	0.12	0.13	0.12
Sat Flow, veh/h	680	1610	82	955	1797	85	1185	1206	424	275	608	850
Grp Volume(v), veh/h	65	0	432	42	0	710	96	0	50	157	0	0
Grp Sat Flow(s),veh/h/ln	680	0	1693	955	0	1882	1185	0	1629	1734	0	0
Q Serve(g_s), s	1.8	0.0	0.0	0.9	0.0	12.5	0.3	0.0	2.2	4.3	0.0	0.0
Cycle Q Clear(g_c), s	14.3	0.0	0.0	0.9	0.0	12.5	7.2	0.0	2.2	6.9	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.26	0.22		0.49
Lane Grp Cap(c), veh/h	490	0	1258	800	0	1399	232	0	217	264	0	0
V/C Ratio(X)	0.13	0.00	0.34	0.05	0.00	0.51	0.41	0.00	0.23	0.60	0.00	0.00
Avail Cap(c_a), veh/h	490	0	1258	800	0	1399	475	0	550	611	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	0.00	0.95	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	0.0	0.0	2.8	0.0	4.2	33.2	0.0	31.1	33.4	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.7	0.1	0.0	1.3	1.2	0.0	0.5	2.1	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(95%),veh/ln	0.1	0.0	0.4	0.2	0.0	5.8	3.2	0.0	1.6	5.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.0	0.0	0.7	2.9	0.0	5.6	34.4	0.0	31.7	35.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	497			752			146			157		
Approach Delay, s/veh	0.9			5.4			33.5			35.5		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	64.4			15.6			64.4			15.6		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			8.9			14.5			9.2		
Green Ext Time (p_c), s	12.6			0.4			18.6			0.4		

Intersection Summary

HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

Notes

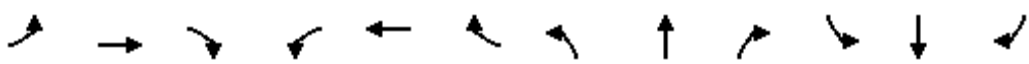
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	563	0	121	273	142	0	0	225	47
Future Volume (vph)	0	0	0	563	0	121	273	142	0	0	225	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.402					
Satd. Flow (perm)	0	0	0	0	1653	1414	672	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	593	127	287	149	0	0	237	49
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					24.7	24.7	28.9	28.9			15.9	15.9
Actuated g/C Ratio					0.39	0.39	0.46	0.46			0.25	0.25
v/c Ratio					0.92	0.20	0.68	0.22			0.57	0.09
Control Delay					41.4	2.8	21.7	11.5			27.0	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					41.4	2.8	21.7	11.5			27.0	0.4
LOS					D	A	C	B			C	A
Approach Delay					34.6			18.2			22.4	
Approach LOS					C			B			C	
Queue Length 50th (ft)					215	0	71	33			81	0
Queue Length 95th (ft)					#405	22	#136	66			145	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					669	662	424	720			447	546
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					0.89	0.19	0.68	0.21			0.53	0.09

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 63.1

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 27.2

Intersection LOS: C

Intersection Capacity Utilization 121.2%

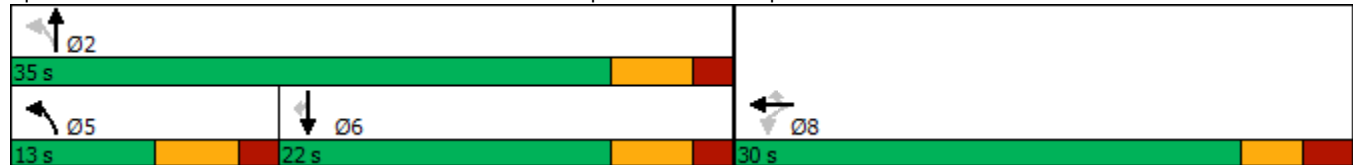
ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	563	0	121	273	142	0	0	225	47
Future Volume (veh/h)	0	0	0	563	0	121	273	142	0	0	225	47
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				593	0	0	287	149	0	0	237	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				688	0		467	712	0	0	403	
Arrive On Green				0.37	0.00	0.00	0.14	0.45	0.00	0.00	0.23	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				593	0	0	287	149	0	0	237	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				17.8	0.0	0.0	7.3	3.3	0.0	0.0	6.8	0.0
Cycle Q Clear(g_c), s				17.8	0.0	0.0	7.3	3.3	0.0	0.0	6.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				688	0		467	712	0	0	403	
V/C Ratio(X)				0.86	0.00		0.61	0.21	0.00	0.00	0.59	
Avail Cap(c_a), veh/h				788	0		467	822	0	0	527	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.8	0.0	0.0	13.6	9.6	0.0	0.0	20.0	0.0
Incr Delay (d2), s/veh				8.8	0.0	0.0	2.4	0.5	0.0	0.0	4.9	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
%ile BackOfQ(95%),veh/ln				13.0	0.0	0.0	4.5	1.8	0.0	0.0	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.6	0.0	0.0	16.0	10.2	0.0	0.0	24.9	0.0
LnGrp LOS				C	A		B	B	A	A	C	
Approach Vol, veh/h					593			436			237	
Approach Delay, s/veh					25.6			14.0			24.9	
Approach LOS					C			B			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	31.0			13.0			18.0			26.7		
Change Period (Y+Rc), s	6.0			6.0			6.0			5.5		
Max Green Setting (Gmax), s	29.0			7.0			16.0			24.5		
Max Q Clear Time (g_c+I1), s	5.3			9.3			8.8			19.8		
Green Ext Time (p_c), s	2.9			0.0			2.1			1.5		
Intersection Summary												
HCM 6th Ctrl Delay	21.5											
HCM 6th LOS	C											

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	3	494	0	0	0	0	376	432	97	698	0
Future Volume (vph)	43	3	494	0	0	0	0	376	432	97	698	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1564	1569	0	0	0	0	1665	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1564	1569	0	0	0	0	1665	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	509	0	0	0	0	833	0	100	720	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	121.2%						ICU Level of Service H					
Analysis Period (min)	15											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2024 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh	21.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	43	3	494	0	0	0	0	376	432	97	698	0
Future Vol, veh/h	43	3	494	0	0	0	0	376	432	97	698	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	44	3	509	0	0	0	0	388	445	100	720	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1308	1308	720	-	0	0	388	0	0
Stage 1	920	920	-	-	-	-	-	-	-
Stage 2	388	388	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	167	200	~ 478	0	-	-	888	-	0
Stage 1	460	411	-	0	-	-	-	-	0
Stage 2	777	653	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	148	0	~ 478	-	-	-	888	-	-
Mov Cap-2 Maneuver	148	0	-	-	-	-	-	-	-
Stage 1	460	0	-	-	-	-	-	-	-
Stage 2	689	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	85	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	148	478	888	-
HCM Lane V/C Ratio	-	-	0.32	1.065	0.113	-
HCM Control Delay (s)	-	-	40.4	89.1	9.6	-
HCM Lane LOS	-	-	E	F	A	-
HCM 95th %tile Q(veh)	-	-	1.3	15.9	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 No Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	793	1165	10
Future Volume (vph)	3	9	8	793	1165	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1802	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1802	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	826	1211	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	71.9%			ICU Level of Service C		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 No Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	793	1165	10
Future Vol, veh/h	3	9	8	793	1165	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	818	1201	10

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2040	1206	1211	0	-	0
Stage 1	1206	-	-	-	-	-
Stage 2	834	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	66	234	513	-	-	-
Stage 1	312	-	-	-	-	-
Stage 2	477	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	64	234	513	-	-	-
Mov Cap-2 Maneuver	64	-	-	-	-	-
Stage 1	303	-	-	-	-	-
Stage 2	477	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	513	-	141	-	-
HCM Lane V/C Ratio	0.016	-	0.088	-	-
HCM Control Delay (s)	12.1	0	33	-	-
HCM Lane LOS	B	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	33	77	9	40	35	59	553	13	49	810	319
Future Volume (vph)	218	33	77	9	40	35	59	553	13	49	810	319
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1683	0	1416	1704	0	1620	1693	0	1628	1672	0
Flt Permitted	0.706			0.682			0.107			0.373		
Satd. Flow (perm)	1204	1683	0	1017	1704	0	182	1693	0	639	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		81			37			4			63	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	229	116	0	9	79	0	62	596	0	52	1189	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	0.95	0.29		0.04	0.21		0.55	0.56		0.13	1.11	
Control Delay	76.8	10.9		20.2	14.2		31.9	13.0		5.6	79.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	76.8	10.9		20.2	14.2		31.9	13.0		5.6	79.5	
LOS	E	B		C	B		C	B		A	E	
Approach Delay		54.6			14.8			14.8			76.4	
Approach LOS		D			B			B			E	
Queue Length 50th (ft)	82	10		3	13		25	245		7	~503	
Queue Length 95th (ft)	#202	47		13	43		m#74	290		19	#726	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	401		203	370		113	1059		399	1068	
Starvation Cap Reductn	0	0		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	0.95	0.29		0.04	0.21		0.55	0.56		0.13	1.11	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 53.5

Intersection LOS: D

Intersection Capacity Utilization 93.7%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2024 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	33	77	9	40	35	59	553	13	49	810	319
Future Volume (veh/h)	218	33	77	9	40	35	59	553	13	49	810	319
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	229	35	57	9	42	23	62	582	13	52	853	325
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	357	141	230	296	221	121	120	1130	25	411	828	316
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1409	707	1151	1113	1105	605	487	1807	40	857	1325	505
Grp Volume(v), veh/h	229	0	92	9	0	65	62	0	595	52	0	1178
Grp Sat Flow(s),veh/h/ln	1409	0	1858	1113	0	1711	487	0	1848	857	0	1830
Q Serve(g_s), s	9.7	0.0	2.5	0.4	0.0	1.9	0.0	0.0	17.2	2.6	0.0	37.5
Cycle Q Clear(g_c), s	11.6	0.0	2.5	2.9	0.0	1.9	37.5	0.0	17.2	19.7	0.0	37.5
Prop In Lane	1.00		0.62	1.00		0.35	1.00		0.02	1.00		0.28
Lane Grp Cap(c), veh/h	357	0	372	296	0	342	120	0	1155	411	0	1144
V/C Ratio(X)	0.64	0.00	0.25	0.03	0.00	0.19	0.52	0.00	0.52	0.13	0.00	1.03
Avail Cap(c_a), veh/h	357	0	372	296	0	342	120	0	1155	411	0	1144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.84	0.00	0.84	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	20.5	21.4	0.0	20.1	42.6	0.0	15.7	14.0	0.0	11.4
Incr Delay (d2), s/veh	3.9	0.0	0.3	0.0	0.0	0.3	12.7	0.0	1.4	0.6	0.0	34.6
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(95%),veh/ln	6.0	0.0	1.9	0.2	0.0	1.3	2.5	0.0	12.9	0.9	0.0	28.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	0.0	20.8	21.5	0.0	20.4	55.3	0.0	17.1	14.6	0.0	46.0
LnGrp LOS	C	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	321			74			657			1230		
Approach Delay, s/veh	26.4			20.5			20.7			44.7		
Approach LOS	C			C			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	19.2			13.6			39.5			4.9		
Green Ext Time (p_c), s	10.9			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	34.4											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	17	61	0	38	16	573	5	10	851	34
Future Volume (vph)	15	0	17	61	0	38	16	573	5	10	851	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1672	0	0	1640	0	0	1722	1648
Flt Permitted		0.772			0.803			0.972			0.993	
Satd. Flow (perm)	0	1343	1581	0	1384	0	0	1596	0	0	1711	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	18	0	104	0	0	625	0	0	907	36
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.6	8.6		8.6			45.1			45.1	45.1
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.08	0.07		0.42			0.52			0.71	0.03
Control Delay		22.2	1.4		18.2			8.2			3.4	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		22.2	1.4		18.2			8.2			3.4	0.1
LOS		C	A		B			A			A	A
Approach Delay		11.2			18.2			8.2			3.2	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		16			223			20	0
Queue Length 95th (ft)		19	3		53			196			m28	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		235	322		287			1200			1286	1249
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		0.07	0.06		0.36			0.52			0.71	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 6.1

Intersection LOS: A

Intersection Capacity Utilization 72.6%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	17	61	0	38	16	573	5	10	851	34
Future Volume (veh/h)	15	0	17	61	0	38	16	573	5	10	851	34
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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	10	64	0	25	17	603	5	11	896	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	287	0	163	200	3	39	74	1213	10	65	1354	1221
Arrive On Green	0.09	0.00	0.10	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1628	0	1586	941	26	378	16	1641	13	6	1832	1652
Grp Volume(v), veh/h	16	0	10	89	0	0	625	0	0	907	0	35
Grp Sat Flow(s),veh/h/ln	1628	0	1586	1346	0	0	1671	0	0	1838	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.3	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.72		0.28	0.03		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	260	0	163	219	0	0	1269	0	0	1389	0	1221
V/C Ratio(X)	0.06	0.00	0.06	0.41	0.00	0.00	0.49	0.00	0.00	0.65	0.00	0.03
Avail Cap(c_a), veh/h	356	0	278	324	0	0	1269	0	0	1389	0	1221
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	24.8	0.0	24.3	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.2	0.0	0.0	1.4	0.0	0.0	0.2	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(95%),veh/ln	0.4	0.0	0.2	2.3	0.0	0.0	0.9	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	24.5	27.8	0.0	0.0	1.4	0.0	0.0	0.2	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	26			89			625			942		
Approach Delay, s/veh	24.8			27.8			1.4			0.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.3			10.7			49.3			10.7		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.5			2.0			6.0		
Green Ext Time (p_c), s	19.5			0.0			29.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	282	59	22	298	133	93	279	17	217	348	287
Future Volume (vph)	216	282	59	22	298	133	93	279	17	217	348	287
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1810	0	1604	1640	1442
Flt Permitted	0.223			0.582			0.442			0.386		
Satd. Flow (perm)	373	1791	1435	927	1697	1577	708	1810	0	652	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		2				296
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	291	61	23	307	137	96	306	0	224	359	296
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	48.2	48.2	48.2	26.1	26.1	26.1	49.5	40.8		59.0	45.6	45.6
Actuated g/C Ratio	0.40	0.40	0.40	0.22	0.22	0.22	0.41	0.34		0.49	0.38	0.38
v/c Ratio	0.70	0.40	0.10	0.11	0.83	0.29	0.27	0.50		0.52	0.58	0.40
Control Delay	36.1	26.3	1.2	35.8	63.2	4.9	20.9	37.0		18.5	28.9	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	36.1	26.3	1.2	35.8	63.2	4.9	20.9	37.0		18.5	28.9	6.8
LOS	D	C	A	D	E	A	C	D		B	C	A
Approach Delay		27.4			44.7			33.2			18.8	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	117	156	0	14	228	0	39	190		97	169	36
Queue Length 95th (ft)	158	202	7	35	306	34	82	313		m157	344	77
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	327	932	795	305	558	625	355	617		434	623	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.68	0.31	0.08	0.08	0.55	0.22	0.27	0.50		0.52	0.58	0.40

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 28.6

Intersection LOS: C

Intersection Capacity Utilization 77.6%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4 (R)
23 s	45 s	20 s	32 s
 Ø6	 Ø7	 Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	216	282	59	22	298	133	93	279	17	217	348	287
Future Volume (veh/h)	216	282	59	22	298	133	93	279	17	217	348	287
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	223	291	31	23	307	0	96	288	17	224	359	225
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	312	677	578	253	350		425	750	44	503	703	595
Arrive On Green	0.13	0.37	0.37	0.20	0.20	0.00	0.06	0.37	0.36	0.15	0.56	0.56
Sat Flow, veh/h	1736	1823	1557	975	1766	1544	1880	2016	119	1616	1655	1402
Grp Volume(v), veh/h	223	291	31	23	307	0	96	0	305	224	359	225
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	975	1766	1544	1880	0	2135	1616	1655	1402
Q Serve(g_s), s	11.6	14.3	1.5	2.3	20.2	0.0	3.7	0.0	12.6	9.7	15.9	10.7
Cycle Q Clear(g_c), s	11.6	14.3	1.5	2.3	20.2	0.0	3.7	0.0	12.6	9.7	15.9	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	312	677	578	253	350		425	0	794	503	703	595
V/C Ratio(X)	0.71	0.43	0.05	0.09	0.88		0.23	0.00	0.38	0.44	0.51	0.38
Avail Cap(c_a), veh/h	344	950	811	381	581		457	0	794	513	703	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	28.2	24.2	39.5	46.7	0.0	21.0	0.0	27.6	17.6	18.5	17.3
Incr Delay (d2), s/veh	6.2	0.2	0.0	0.1	4.4	0.0	0.3	0.0	1.4	0.6	2.6	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(95%),veh/ln	8.9	10.1	1.0	1.0	14.0	0.0	3.0	0.0	11.1	6.0	9.6	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.2	28.4	24.2	39.5	51.1	0.0	21.2	0.0	29.0	18.2	21.1	19.2
LnGrp LOS	D	C	C	D	D		C	A	C	B	C	B
Approach Vol, veh/h	545				330				401			
Approach Delay, s/veh	32.2				50.3				27.2			
Approach LOS	C				D				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.8	29.3	19.3	50.6		50.1	13.0	57.0				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	14.1	22.7	12.2	14.6		16.8	6.2	18.4				
Green Ext Time (p_c), s	0.2	0.1	0.1	1.0		0.1	0.0	2.5				

Intersection Summary

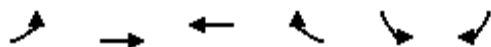
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2024 No Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	475	409	56	37	1
Future Volume (vph)	6	475	409	56	37	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1763	0	1670	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1754	1828	1763	0	1670	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	495	484	0	40	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	475	409	56	37	1
Future Vol, veh/h	6	475	409	56	37	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	495	426	58	39	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	484	0	-	0	962	455
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	507	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	840	-	-	-	283	625
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	840	-	-	-	281	625
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	650	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		14.1		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	840	-	-	-	437	
HCM Lane V/C Ratio	0.007	-	-	-	0.091	
HCM Control Delay (s)	9.3	-	-	-	14.1	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2024 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	81	76	4	51	55	32	258	6	84	310	47
Future Volume (vph)	77	81	76	4	51	55	32	258	6	84	310	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1396	0	0	1575	0	0	1668	0	0	1572	0
Flt Permitted		0.984			0.998			0.995			0.991	
Satd. Flow (perm)	0	1396	0	0	1575	0	0	1668	0	0	1572	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	243	0	0	114	0	0	308	0	0	460	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	65.5%											
Analysis Period (min)	15											
	ICU Level of Service C											

Intersection	
Intersection Delay, s/veh	22.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	77	81	76	4	51	55	32	258	6	84	310	47
Future Vol, veh/h	77	81	76	4	51	55	32	258	6	84	310	47
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	80	84	79	4	53	57	33	269	6	88	323	49
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17.4	11.8	17.4	32
HCM LOS	C	B	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	33%	4%	19%
Vol Thru, %	87%	35%	46%	70%
Vol Right, %	2%	32%	50%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	296	234	110	441
LT Vol	32	77	4	84
Through Vol	258	81	51	310
RT Vol	6	76	55	47
Lane Flow Rate	308	244	115	459
Geometry Grp	1	1	1	1
Degree of Util (X)	0.555	0.496	0.217	0.817
Departure Headway (Hd)	6.478	7.331	6.831	6.399
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	555	490	524	565
Service Time	4.53	5.386	4.9	4.443
HCM Lane V/C Ratio	0.555	0.498	0.219	0.812
HCM Control Delay	17.4	17.4	11.8	32
HCM Lane LOS	C	C	B	D
HCM 95th-tile Q	3.4	2.7	0.8	8.2

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	610	82	130	519	88	124
Future Volume (vph)	610	82	130	519	88	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1835	0	1761	1958	1577	0
Flt Permitted			0.228		0.980	
Satd. Flow (perm)	1835	0	423	1958	1577	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	8					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	699	0	131	524	214	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	62.9		76.7	75.5	24.1	
Actuated g/C Ratio	0.57		0.70	0.69	0.22	
v/c Ratio	0.66		0.33	0.39	0.62	
Control Delay	21.3		7.0	8.2	46.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	21.3		7.0	8.2	46.1	
LOS	C		A	A	D	
Approach Delay	21.3			8.0	46.1	
Approach LOS	C			A	D	
Queue Length 50th (ft)	321		31	161	137	
Queue Length 95th (ft)	535		m46	m232	200	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1053		404	1343	570	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.66		0.32	0.39	0.38	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 19.1

Intersection LOS: B

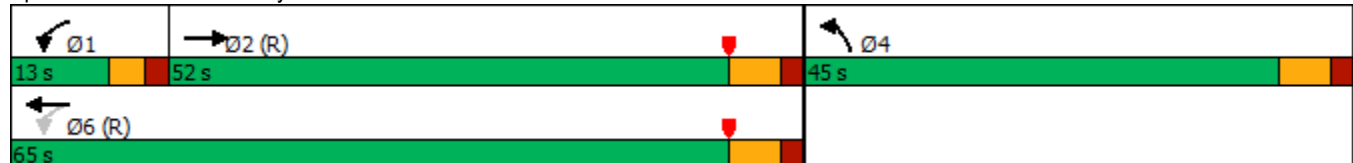
Intersection Capacity Utilization 71.9%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2024 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	610	82	130	519	88	124
Future Volume (veh/h)	610	82	130	519	88	124
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	616	81	131	524	89	125
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	985	130	496	1536	118	165
Arrive On Green	0.64	0.64	0.05	0.73	0.17	0.16
Sat Flow, veh/h	1528	201	1927	2090	690	968
Grp Volume(v), veh/h	0	697	131	524	215	0
Grp Sat Flow(s),veh/h/ln	0	1728	1927	2090	1666	0
Q Serve(g_s), s	0.0	26.5	2.3	9.8	13.5	0.0
Cycle Q Clear(g_c), s	0.0	26.5	2.3	9.8	13.5	0.0
Prop In Lane		0.12	1.00		0.41	0.58
Lane Grp Cap(c), veh/h	0	1114	496	1536	284	0
V/C Ratio(X)	0.00	0.63	0.26	0.34	0.76	0.00
Avail Cap(c_a), veh/h	0	1114	550	1536	603	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	11.7	9.1	5.2	43.7	0.0
Incr Delay (d2), s/veh	0.0	2.7	0.3	0.6	13.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	15.1	1.5	6.8	10.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	14.3	9.4	5.8	57.5	0.0
LnGrp LOS	A	B	A	A	E	A
Approach Vol, veh/h	697			655	215	
Approach Delay, s/veh	14.3			6.5	57.5	
Approach LOS	B			A	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.9	76.1		24.0		86.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	4.3	28.5		15.5		11.8
Green Ext Time (p_c), s	0.1	11.7		2.2		15.7
Intersection Summary						
HCM 6th Ctrl Delay			17.0			
HCM 6th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	793	0	1	812	100	0	0	1	48	0	35
Future Volume (vph)	16	793	0	1	812	100	0	0	1	48	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	826	0	1	950	0	0	1	0	50	36	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 64.8% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	793	0	1	812	100	0	0	1	48	0	35
Future Vol, veh/h	16	793	0	1	812	100	0	0	1	48	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	17	826	0	1	846	104	0	0	1	50	0	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	950	0	0	826	0	0	1778	1812	826	1761	1760	898
Stage 1	-	-	-	-	-	-	860	860	-	900	900	-
Stage 2	-	-	-	-	-	-	918	952	-	861	860	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	654	-	-	470	-	-	84	97	410	95	115	383
Stage 1	-	-	-	-	-	-	431	413	-	431	418	-
Stage 2	-	-	-	-	-	-	401	379	-	451	433	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	654	-	-	470	-	-	74	94	410	93	112	383
Mov Cap-2 Maneuver	-	-	-	-	-	-	74	94	-	93	112	-
Stage 1	-	-	-	-	-	-	420	402	-	420	417	-
Stage 2	-	-	-	-	-	-	362	378	-	438	422	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	13.8	53.8
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	410	654	-	-	470	-	-	93	383
HCM Lane V/C Ratio	0.003	0.025	-	-	0.002	-	-	0.538	0.095
HCM Control Delay (s)	13.8	10.6	-	-	12.7	-	-	81.8	15.4
HCM Lane LOS	B	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	2.4	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	560	49	152	652	15	254	3	159	34	4	14
Future Volume (vph)	21	560	49	152	652	15	254	3	159	34	4	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1744	0
Flt Permitted	0.397			0.280			0.745			0.547		
Satd. Flow (perm)	690	1783	1584	463	1697	1573	1329	1574	0	1014	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			167			15
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	589	52	160	686	16	267	170	0	36	19	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	59.2	59.2	59.2	75.6	74.3	74.3	25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.69	0.68	0.68	0.23	0.23		0.23	0.23	
v/c Ratio	0.06	0.61	0.06	0.38	0.60	0.01	0.89	0.35		0.16	0.05	
Control Delay	14.0	17.2	2.2	7.2	8.8	0.5	71.3	7.7		35.4	17.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.0	17.2	2.2	7.2	8.8	0.5	71.3	7.7		35.4	17.4	
LOS	B	B	A	A	A	A	E	A		D	B	
Approach Delay		15.9			8.4			46.6			29.2	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	6	167	0	27	148	0	181	2		20	2	
Queue Length 95th (ft)	m15	285	m5	40	203	m0	#326	56		49	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	371	959	890	495	1146	1072	315	500		240	425	
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	0.06	0.61	0.06	0.32	0.60	0.01	0.85	0.34		0.15	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 19.7

Intersection LOS: B

Intersection Capacity Utilization 84.7%

ICU Level of Service E

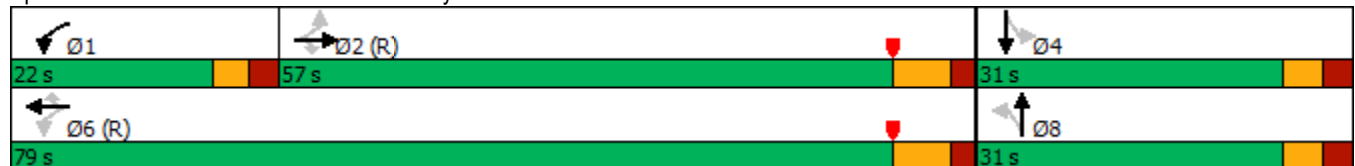
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2024 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	560	49	152	652	15	254	3	159	34	4	14
Future Volume (veh/h)	21	560	49	152	652	15	254	3	159	34	4	14
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	22	589	30	160	686	11	267	3	102	36	4	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	545	1192	1015	620	1203	1067	377	10	344	290	131	263
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.21	0.21	0.20	0.21	0.21	0.20
Sat Flow, veh/h	824	2047	1743	1666	1736	1540	1489	48	1642	1395	626	1253
Grp Volume(v), veh/h	22	589	30	160	686	11	267	0	105	36	0	12
Grp Sat Flow(s),veh/h/ln	824	2047	1743	1666	1736	1540	1489	0	1691	1395	0	1879
Q Serve(g_s), s	0.0	0.0	0.0	3.9	0.0	0.0	19.0	0.0	5.8	2.4	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.9	0.0	0.0	19.1	0.0	5.8	7.8	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.67
Lane Grp Cap(c), veh/h	545	1192	1015	620	1203	1067	377	0	354	290	0	394
V/C Ratio(X)	0.04	0.49	0.03	0.26	0.57	0.01	0.71	0.00	0.30	0.12	0.00	0.03
Avail Cap(c_a), veh/h	545	1192	1015	769	1203	1067	418	0	401	329	0	446
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)	1.00	1.00	1.00	0.82	0.82	0.82	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.0	0.0	0.0	41.9	0.0	37.1	39.7	0.0	34.9
Incr Delay (d2), s/veh	0.1	1.5	0.1	0.2	1.6	0.0	4.9	0.0	0.5	0.2	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(95%),veh/ln	0.0	0.9	0.0	2.0	1.0	0.0	12.0	0.0	4.5	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.1	1.5	0.1	6.2	1.6	0.0	46.8	0.0	37.5	39.9	0.0	34.9
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	641			857			372			48		
Approach Delay, s/veh	1.4			2.4			44.2			38.6		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	12.2	69.9	28.0			82.0	28.0					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25			72.2	* 25					
Max Q Clear Time (g_c+I1), s	6.4	2.5	10.3			2.5	21.6					
Green Ext Time (p_c), s	0.3	0.7	0.1			0.8	0.5					

Intersection Summary

HCM 6th Ctrl Delay 11.1
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	507	12	4	635	66	9	3	10	61	38	127
Future Volume (vph)	106	507	12	4	635	66	9	3	10	61	38	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1742	0	1744	1818	1561	0	1765	0	1719	1573	0
Flt Permitted	0.303			0.455				0.601		0.742		
Satd. Flow (perm)	534	1742	0	835	1818	1561	0	1082	0	1342	1573	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		11			137	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	558	0	4	683	71	0	24	0	66	178	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	89.0	88.1		75.5	75.5	75.5		11.9		11.9	11.9	
Actuated g/C Ratio	0.81	0.80		0.69	0.69	0.69		0.11		0.11	0.11	
v/c Ratio	0.22	0.40		0.01	0.55	0.06		0.19		0.46	0.61	
Control Delay	4.0	4.9		6.5	12.7	1.8		32.1		55.0	22.1	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.0	4.9		6.5	12.9	1.8		32.1		55.0	22.1	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		4.8			11.8			32.1			31.0	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	14	80		1	273	2		8		44	27	
Queue Length 95th (ft)	m30	184		m3	443	8		33		86	94	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	530	1395		572	1247	1095		238		285	442	
Starvation Cap Reductn	0	0		0	131	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	0.22	0.40		0.01	0.61	0.06		0.10		0.23	0.40	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 12.1

Intersection LOS: B

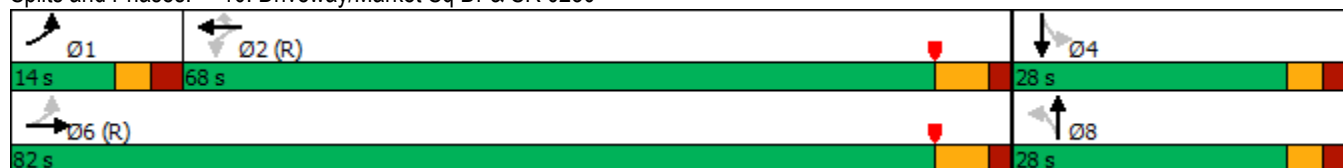
Intersection Capacity Utilization 64.7%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2024 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	507	12	4	635	66	9	3	10	61	38	127
Future Volume (veh/h)	106	507	12	4	635	66	9	3	10	61	38	127
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	114	545	11	4	683	58	10	3	7	66	41	66
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	620	1350	27	711	1406	1200	67	27	24	189	59	96
Arrive On Green	0.09	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1629	1657	33	889	1935	1652	187	291	257	1375	631	1016
Grp Volume(v), veh/h	114	0	556	4	683	58	20	0	0	66	0	107
Grp Sat Flow(s),veh/h/ln	1629	0	1691	889	1935	1652	735	0	0	1375	0	1647
Q Serve(g_s), s	1.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	6.9
Cycle Q Clear(g_c), s	1.7	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	5.4	0.0	6.9
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.35	1.00		0.62
Lane Grp Cap(c), veh/h	620	0	1378	711	1406	1200	112	0	0	189	0	155
V/C Ratio(X)	0.18	0.00	0.40	0.01	0.49	0.05	0.18	0.00	0.00	0.35	0.00	0.69
Avail Cap(c_a), veh/h	684	0	1378	711	1406	1200	283	0	0	352	0	350
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)	0.78	0.00	0.78	0.90	0.90	0.90	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.4	0.0	0.0	0.0	0.0	0.0	46.2	0.0	0.0	47.6	0.0	48.6
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.1	0.1	0.8	0.0	0.0	1.1	0.0	5.4
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(95%),veh/ln	0.6	0.0	0.5	0.0	0.8	0.0	1.0	0.0	0.0	3.2	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.5	0.0	0.7	0.0	1.1	0.1	46.9	0.0	0.0	48.7	0.0	53.9
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	670			745			20			173		
Approach Delay, s/veh	1.0			1.0			46.9			51.9		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.7	85.3	15.0		95.0		15.0					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.2	2.5	8.9		2.5		9.0					
Green Ext Time (p_c), s	0.1	0.9	0.5		0.6		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				7.0								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	485	23	20	518	13	66	23	17	15	20	74
Future Volume (vph)	54	485	23	20	518	13	66	23	17	15	20	74
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1744	0	1620	1698	0	1541	1660	0	0	1821	0
Flt Permitted	0.426			0.439			0.538				0.952	
Satd. Flow (perm)	740	1744	0	749	1698	0	873	1660	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			18			78	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	535	0	21	559	0	69	42	0	0	115	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.8	86.8		86.8	86.8		13.3	13.3			13.3	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.10	0.39		0.04	0.42		0.66	0.19			0.41	
Control Delay	5.2	6.3		3.5	5.3		73.0	29.1			20.7	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0			0.0	
Total Delay	5.2	6.5		3.5	5.3		73.0	29.1			20.7	
LOS	A	A		A	A		E	C			C	
Approach Delay		6.4			5.2			56.4			20.7	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	11	149		3	99		47	15			24	
Queue Length 95th (ft)	27	194		10	194		91	46			73	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	583	1376		591	1339		325	630			699	
Starvation Cap Reductn	0	207		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	3		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.10	0.46		0.04	0.42		0.21	0.07			0.16	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.0

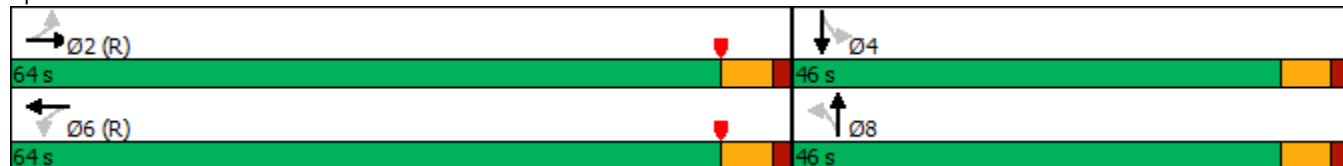
Intersection LOS: B

Intersection Capacity Utilization 67.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary
13: Sheaffer Rd & SR 0230

2024 No Build
SAT Peak Hour

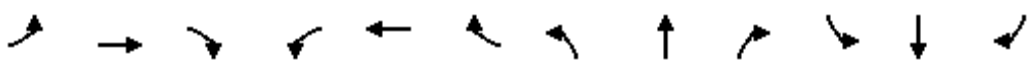
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	485	23	20	518	13	66	23	17	15	20	74
Future Volume (veh/h)	54	485	23	20	518	13	66	23	17	15	20	74
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	57	511	19	21	545	13	69	24	6	16	21	31
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	667	1390	52	812	1554	37	170	100	25	62	50	60
Arrive On Green	1.00	1.00	1.00	0.84	0.84	0.83	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	784	1663	62	893	1859	44	1245	1351	338	287	681	811
Grp Volume(v), veh/h	57	0	530	21	0	558	69	0	30	68	0	0
Grp Sat Flow(s),veh/h/ln	784	0	1725	893	0	1904	1245	0	1689	1779	0	0
Q Serve(g_s), s	0.7	0.0	0.0	0.4	0.0	7.5	0.9	0.0	1.8	1.9	0.0	0.0
Cycle Q Clear(g_c), s	8.2	0.0	0.0	0.4	0.0	7.5	4.9	0.0	1.8	4.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	1.00		0.20	0.24		0.46
Lane Grp Cap(c), veh/h	667	0	1442	812	0	1591	170	0	125	156	0	0
V/C Ratio(X)	0.09	0.00	0.37	0.03	0.00	0.35	0.41	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	667	0	1442	812	0	1591	541	0	630	675	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)	0.92	0.00	0.92	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.3	0.0	0.0	1.5	0.0	2.1	49.3	0.0	48.1	49.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.1	0.0	0.6	1.6	0.0	1.0	1.9	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	2.9	3.4	0.0	1.4	3.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.0	0.7	1.6	0.0	2.7	50.9	0.0	49.1	51.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	587			579			99			68		
Approach Delay, s/veh	0.7			2.7			50.3			51.2		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.8			13.2			96.8			13.2		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.0			9.5			6.9		
Green Ext Time (p_c), s	19.1			0.2			20.2			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	7.8											
HCM 6th LOS	A											
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (vph)	0	0	0	336	1	59	204	112	0	0	127	27
Future Volume (vph)	0	0	0	336	1	59	204	112	0	0	127	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1642	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.953		0.497					
Satd. Flow (perm)	0	0	0	0	1642	1442	823	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	351	61	213	117	0	0	132	28
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.5	16.5	27.3	27.3			14.2	14.2
Actuated g/C Ratio					0.31	0.31	0.51	0.51			0.27	0.27
v/c Ratio					0.69	0.11	0.40	0.14			0.29	0.05
Control Delay					24.3	0.4	10.7	8.4			18.6	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					24.3	0.4	10.7	8.4			18.6	0.2
LOS					C	A	B	A			B	A
Approach Delay					20.7			9.9			15.4	
Approach LOS					C			A			B	
Queue Length 50th (ft)					92	0	35	18			33	0
Queue Length 95th (ft)					183	0	78	45			75	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					636	659	534	930			559	612
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					0.55	0.09	0.40	0.13			0.24	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 53.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 15.8

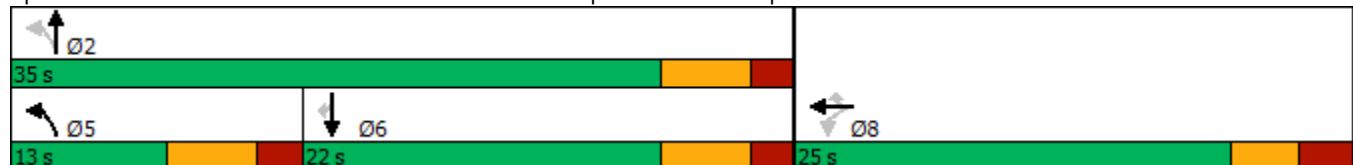
Intersection LOS: B

Intersection Capacity Utilization 54.2%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶	↷			↷	↶
Traffic Volume (veh/h)	0	0	0	336	1	59	204	112	0	0	127	27
Future Volume (veh/h)	0	0	0	336	1	59	204	112	0	0	127	27
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				350	1	0	212	117	0	0	132	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				474	1		661	913	0	0	506	
Arrive On Green				0.25	0.27	0.00	0.16	0.53	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1780	5	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				351	0	0	212	117	0	0	132	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				8.7	0.0	0.0	3.7	1.6	0.0	0.0	2.7	0.0
Cycle Q Clear(g_c), s				8.7	0.0	0.0	3.7	1.6	0.0	0.0	2.7	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				476	0		661	913	0	0	506	
V/C Ratio(X)				0.74	0.00		0.32	0.13	0.00	0.00	0.26	
Avail Cap(c_a), veh/h				765	0		675	1071	0	0	661	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.5	0.0	0.0	7.9	5.6	0.0	0.0	13.6	0.0
Incr Delay (d2), s/veh				2.3	0.0	0.0	0.3	0.2	0.0	0.0	1.0	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
%ile BackOfQ(95%),veh/ln				6.3	0.0	0.0	1.7	0.7	0.0	0.0	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.8	0.0	0.0	8.2	5.8	0.0	0.0	14.6	0.0
LnGrp LOS				B	A		A	A	A	A	B	
Approach Vol, veh/h					351			329			132	
Approach Delay, s/veh					18.8			7.3			14.6	
Approach LOS					B			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		30.6			12.6	18.0		17.2				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		3.6			5.7	4.7		10.7				
Green Ext Time (p_c), s		2.2			0.1	1.5		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.5								
HCM 6th LOS				B								

Notes

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

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	207	0	0	0	0	285	344	86	379	0
Future Volume (vph)	23	0	207	0	0	0	0	285	344	86	379	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	223	0	0	0	0	676	0	92	408	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.2%

ICU Level of Service A

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2024 No Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	23	0	207	0	0	0	0	285	344	86	379	0
Future Vol, veh/h	23	0	207	0	0	0	0	285	344	86	379	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	25	0	223	0	0	0	0	306	370	92	408	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	898	898	408	-	0	0	306	0	0
Stage 1	592	592	-	-	-	-	-	-	-
Stage 2	306	306	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	321	326	704	0	-	-	976	-	0
Stage 1	659	549	-	0	-	-	-	-	0
Stage 2	869	700	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	291	0	704	-	-	-	976	-	-
Mov Cap-2 Maneuver	291	0	-	-	-	-	-	-	-
Stage 1	659	0	-	-	-	-	-	-	-
Stage 2	787	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	291	704	976	-
HCM Lane V/C Ratio	-	-	0.085	0.316	0.095	-
HCM Control Delay (s)	-	-	18.5	12.5	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	1.4	0.3	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 No Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	13	603	601	3
Future Volume (vph)	6	11	13	603	601	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1796	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1796	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	655	642	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	52.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 No Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	13	603	601	3
Future Vol, veh/h	6	11	13	603	601	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	14	641	639	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1310	641	642	0	-	0
Stage 1	641	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	174	501	773	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	530	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	169	501	773	-	-	-
Mov Cap-2 Maneuver	169	-	-	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	530	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	773	-	296	-	-
HCM Lane V/C Ratio	0.018	-	0.061	-	-
HCM Control Delay (s)	9.7	0	18	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	23	53	11	21	32	29	445	8	19	424	179
Future Volume (vph)	151	23	53	11	21	32	29	445	8	19	424	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1683	0	1572	1636	0	1620	1710	0	1550	1685	0
Flt Permitted	0.720			0.705			0.354			0.461		
Satd. Flow (perm)	1228	1683	0	1167	1636	0	604	1710	0	752	1685	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56			34			2			60	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	80	0	12	56	0	31	476	0	20	634	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.7	12.7		12.4	12.4		40.5	40.5		40.5	40.5	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.68	0.68		0.68	0.68	
v/c Ratio	0.61	0.20		0.05	0.15		0.08	0.41		0.04	0.55	
Control Delay	31.5	9.8		17.9	11.0		5.4	7.9		5.8	8.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.5	9.8		17.9	11.0		5.4	7.9		5.8	8.9	
LOS	C	A		B	B		A	A		A	A	
Approach Delay		24.2			12.3			7.8			8.8	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)	51	7		3	6		4	84		3	114	
Queue Length 95th (ft)	102	35		14	29		m16	196		10	217	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	307	462		291	434		407	1155		507	1157	
Starvation Cap Reductn	0	0		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	0.52	0.17		0.04	0.13		0.08	0.41		0.04	0.55	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 11.1

Intersection LOS: B

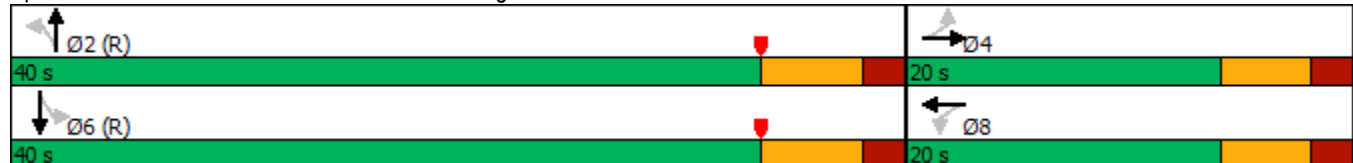
Intersection Capacity Utilization 59.3%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2024 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	23	53	11	21	32	29	445	8	19	424	179
Future Volume (veh/h)	151	23	53	11	21	32	29	445	8	19	424	179
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	159	24	29	12	22	20	31	468	7	20	446	154
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	346	152	184	315	157	142	518	1188	18	515	889	307
Arrive On Green	0.18	0.18	0.16	0.18	0.18	0.16	0.21	0.21	0.21	0.65	0.65	0.63
Sat Flow, veh/h	1439	852	1029	1264	878	798	837	1837	27	923	1375	475
Grp Volume(v), veh/h	159	0	53	12	0	42	31	0	475	20	0	600
Grp Sat Flow(s),veh/h/ln	1439	0	1881	1264	0	1676	837	0	1864	923	0	1849
Q Serve(g_s), s	6.3	0.0	1.4	0.5	0.0	1.3	1.9	0.0	13.1	0.8	0.0	10.3
Cycle Q Clear(g_c), s	7.6	0.0	1.4	1.9	0.0	1.3	12.2	0.0	13.1	13.9	0.0	10.3
Prop In Lane	1.00		0.55	1.00		0.48	1.00		0.01	1.00		0.26
Lane Grp Cap(c), veh/h	346	0	335	315	0	299	518	0	1205	515	0	1196
V/C Ratio(X)	0.46	0.00	0.16	0.04	0.00	0.14	0.06	0.00	0.39	0.04	0.00	0.50
Avail Cap(c_a), veh/h	449	0	470	406	0	419	518	0	1205	515	0	1196
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.94	0.00	0.94	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.0	0.0	21.1	21.7	0.0	21.0	17.5	0.0	13.5	10.0	0.0	5.6
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0	0.9	0.1	0.0	1.5
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(95%),veh/ln	3.7	0.0	1.1	0.2	0.0	0.9	0.8	0.0	10.6	0.3	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	21.3	21.7	0.0	21.2	17.7	0.0	14.4	10.2	0.0	7.1
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	A
Approach Vol, veh/h	212			54			506			620		
Approach Delay, s/veh	24.0			21.3			14.6			7.2		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.3			15.7			44.3			15.7		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	15.1			9.6			12.3			3.9		
Green Ext Time (p_c), s	9.3			0.3			13.2			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	13.0											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	23	0	7	15	474	7	11	493	7
Future Volume (vph)	5	1	12	23	0	7	15	474	7	11	493	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1698	0	0	1668	0	0	1722	1648
Flt Permitted					0.986			0.983			0.988	
Satd. Flow (perm)	0	1740	1581	0	1739	0	0	1643	0	0	1703	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	31	0	0	522	0	0	531	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.12			0.36			0.35	0.00
Control Delay		23.5	0.5		5.0			2.9			1.5	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.5		5.0			2.9			1.5	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.8			5.0			2.9			1.5	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		12			104			13	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		377			1457			1510	1466
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		0.02	0.04		0.08			0.36			0.35	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 2.3

Intersection LOS: A

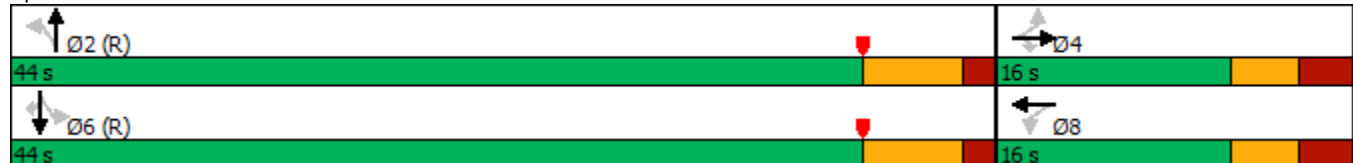
Intersection Capacity Utilization 56.0%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	23	0	7	15	474	7	11	493	7
Future Volume (veh/h)	5	1	12	23	0	7	15	474	7	11	493	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	24	0	3	16	499	7	12	519	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	171	12	69	161	0	6	76	1333	18	71	1454	1319
Arrive On Green	0.03	0.04	0.04	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1397	279	1586	1109	0	139	18	1670	23	12	1822	1652
Grp Volume(v), veh/h	6	0	6	27	0	0	522	0	0	531	0	7
Grp Sat Flow(s),veh/h/ln	1676	0	1586	1248	0	0	1711	0	0	1833	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	1.3	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.89		0.11	0.03		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	155	0	69	147	0	0	1399	0	0	1494	0	1319
V/C Ratio(X)	0.04	0.00	0.09	0.18	0.00	0.00	0.37	0.00	0.00	0.36	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1399	0	0	1494	0	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.83	0.00	0.83
Uniform Delay (d), s/veh	28.0	0.0	27.6	28.7	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.5	0.6	0.0	0.0	0.8	0.0	0.0	0.5	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(95%),veh/ln	0.2	0.0	0.2	0.7	0.0	0.0	1.0	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	0.0	28.1	29.3	0.0	0.0	2.5	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	12			27			522			538		
Approach Delay, s/veh	28.1			29.3			2.5			0.5		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	52.9			7.1			52.9			7.1		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	7.3			2.2			2.0			3.3		
Green Ext Time (p_c), s	14.1			0.0			15.8			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	201	287	55	26	309	135	70	163	14	125	172	179
Future Volume (vph)	201	287	55	26	309	135	70	163	14	125	172	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1845	0	1558	1624	1499
Flt Permitted	0.283			0.581			0.646			0.587		
Satd. Flow (perm)	468	1809	1435	934	1731	1592	1180	1845	0	962	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		5				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	205	293	56	27	315	138	71	180	0	128	176	183
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	30.1	30.1	30.1	16.3	16.3	16.3	18.9	13.0		20.2	15.9	15.9
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.29	0.20		0.31	0.24	0.24
v/c Ratio	0.58	0.35	0.08	0.12	0.73	0.24	0.18	0.49		0.35	0.45	0.33
Control Delay	21.4	14.9	0.2	23.1	36.5	0.9	14.6	28.8		17.0	27.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	21.4	14.9	0.2	23.1	36.5	0.9	14.6	28.8		17.0	27.6	3.1
LOS	C	B	A	C	D	A	B	C		B	C	A
Approach Delay		15.8			25.5			24.8			15.6	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	54	81	0	9	125	0	19	67		35	69	0
Queue Length 95th (ft)	#115	149	0	29	#248	0	43	126		71	129	21
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	354	913	803	272	505	645	412	512		372	485	621
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.58	0.32	0.07	0.10	0.62	0.21	0.17	0.35		0.34	0.36	0.29

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 65.5

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 19.7

Intersection LOS: B

Intersection Capacity Utilization 65.3%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	201	287	55	26	309	135	70	163	14	125	172	179
Future Volume (veh/h)	201	287	55	26	309	135	70	163	14	125	172	179
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	205	293	50	27	315	0	71	166	11	128	176	101
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	418	835	707	339	404		367	276	18	372	300	265
Arrive On Green	0.14	0.45	0.45	0.23	0.23	0.00	0.07	0.14	0.12	0.11	0.18	0.18
Sat Flow, veh/h	1723	1837	1557	964	1794	1557	2069	2027	134	1576	1641	1450
Grp Volume(v), veh/h	205	293	50	27	315	0	71	0	177	128	176	101
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	964	1794	1557	2069	0	2161	1576	1641	1450
Q Serve(g_s), s	4.7	6.1	1.1	1.3	9.7	0.0	1.7	0.0	4.5	3.9	5.8	3.6
Cycle Q Clear(g_c), s	4.7	6.1	1.1	1.3	9.7	0.0	1.7	0.0	4.5	3.9	5.8	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	418	835	707	339	404		367	0	294	372	300	265
V/C Ratio(X)	0.49	0.35	0.07	0.08	0.78		0.19	0.00	0.60	0.34	0.59	0.38
Avail Cap(c_a), veh/h	418	998	845	425	563		511	0	642	408	487	430
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	10.4	9.1	18.2	21.5	0.0	19.5	0.0	24.0	18.3	22.1	21.2
Incr Delay (d2), s/veh	0.9	0.1	0.0	0.0	2.9	0.0	0.3	0.0	2.0	0.5	1.8	0.9
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(95%),veh/ln	2.8	3.4	0.5	0.5	6.9	0.0	1.4	0.0	4.3	2.3	3.8	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	10.5	9.1	18.2	24.3	0.0	19.8	0.0	26.0	18.8	23.9	22.1
LnGrp LOS	B	B	A	B	C		B	A	C	B	C	C
Approach Vol, veh/h	548			342			248			405		
Approach Delay, s/veh	11.8			23.9			24.2			21.8		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	18.8	12.6	14.0		32.3	9.9	16.8				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	7.2	12.2	6.4	6.5		8.6	4.2	8.3				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.5		0.1	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay 19.1
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2024 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	49	32	15	32	47	19	174	7	24	177	33
Future Volume (vph)	37	49	32	15	32	47	19	174	7	24	177	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1680	0	0	1631	0	0	1770	0	0	1850	0
Flt Permitted		0.984			0.992			0.995			0.995	
Satd. Flow (perm)	0	1680	0	0	1631	0	0	1770	0	0	1850	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	123	0	0	98	0	0	208	0	0	243	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.5%											
Analysis Period (min)	15											
	ICU Level of Service A											

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

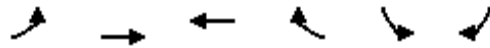
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	37	49	32	15	32	47	19	174	7	24	177	33
Future Vol, veh/h	37	49	32	15	32	47	19	174	7	24	177	33
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	39	51	33	16	33	49	20	181	7	25	184	34
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	8.7	9.8	9.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	31%	16%	10%
Vol Thru, %	87%	42%	34%	76%
Vol Right, %	4%	27%	50%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	200	118	94	234
LT Vol	19	37	15	24
Through Vol	174	49	32	177
RT Vol	7	32	47	33
Lane Flow Rate	208	123	98	244
Geometry Grp	1	1	1	1
Degree of Util (X)	0.279	0.175	0.132	0.314
Departure Headway (Hd)	4.82	5.124	4.862	4.64
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	742	694	730	770
Service Time	2.88	3.193	2.936	2.697
HCM Lane V/C Ratio	0.28	0.177	0.134	0.317
HCM Control Delay	9.8	9.3	8.7	9.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.1	0.6	0.5	1.3

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2024 No Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	387	421	33	31	3
Future Volume (vph)	3	387	421	33	31	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1793	0	1658	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1793	0	1658	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	403	473	0	35	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.2% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	387	421	33	31	3
Future Vol, veh/h	3	387	421	33	31	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	403	439	34	32	3

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	473	0	0	865	456
Stage 1	-	-	-	456	-
Stage 2	-	-	-	409	-
Critical Hdwy	4.1	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	3	3.1
Pot Cap-1 Maneuver	847	-	-	329	624
Stage 1	-	-	-	692	-
Stage 2	-	-	-	733	-
Platoon blocked, %	-	-	-		
Mov Cap-1 Maneuver	847	-	-	328	624
Mov Cap-2 Maneuver	-	-	-	474	-
Stage 1	-	-	-	689	-
Stage 2	-	-	-	733	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	847	-	-	-	484
HCM Lane V/C Ratio	0.004	-	-	-	0.073
HCM Control Delay (s)	9.3	-	-	-	13
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

APPENDIX L3

2024 BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	445	78	88	387	142	151
Future Volume (vph)	445	78	88	387	142	151
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1685	0	1662	1766	1530	0
Flt Permitted			0.219		0.976	
Satd. Flow (perm)	1685	0	383	1766	1530	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	15					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	581	0	98	430	326	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.6		42.3	41.1	18.5	
Actuated g/C Ratio	0.45		0.60	0.59	0.26	
v/c Ratio	0.76		0.26	0.41	0.81	
Control Delay	25.4		5.6	6.5	41.9	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	25.4		5.6	6.5	41.9	
LOS	C		A	A	D	
Approach Delay	25.4			6.3	41.9	
Approach LOS	C			A	D	
Queue Length 50th (ft)	211		12	58	130	
Queue Length 95th (ft)	#390		23	82	#256	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	768		377	1037	410	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.76		0.26	0.41	0.80	

Intersection Summary

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 65.1%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 3: Maytown Rd & SR 0230

↙ Ø1	→ Ø2 (R)	↖ Ø4
12 s	34 s	24 s
↘ Ø6 (R)		
46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2024 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	445	78	88	387	142	151
Future Volume (veh/h)	445	78	88	387	142	151
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	494	81	98	430	158	168
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	656	108	400	1171	191	203
Arrive On Green	0.48	0.46	0.15	1.00	0.24	0.23
Sat Flow, veh/h	1381	226	1846	1927	785	834
Grp Volume(v), veh/h	0	575	98	430	327	0
Grp Sat Flow(s),veh/h/ln	0	1607	1846	1927	1624	0
Q Serve(g_s), s	0.0	20.5	1.6	0.0	13.4	0.0
Cycle Q Clear(g_c), s	0.0	20.5	1.6	0.0	13.4	0.0
Prop In Lane		0.14	1.00		0.48	0.51
Lane Grp Cap(c), veh/h	0	764	400	1171	396	0
V/C Ratio(X)	0.00	0.75	0.24	0.37	0.83	0.00
Avail Cap(c_a), veh/h	0	764	473	1171	436	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	15.1	9.7	0.0	25.3	0.0
Incr Delay (d2), s/veh	0.0	6.8	0.3	0.9	16.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	12.4	0.9	0.5	10.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	21.8	10.0	0.9	41.4	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	575			528	327	
Approach Delay, s/veh	21.8			2.6	41.4	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.3	38.5		22.3		47.7
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.6	22.5		15.4		2.0
Green Ext Time (p_c), s	0.1	3.6		0.7		11.3
Intersection Summary						
HCM 6th Ctrl Delay			19.2			
HCM 6th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	624	1	0	568	45	0	0	2	45	0	34
Future Volume (vph)	25	624	1	0	568	45	0	0	2	45	0	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	702	0	0	689	0	0	2	0	51	38	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.9%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	624	1	0	568	45	0	0	2	45	0	34
Future Vol, veh/h	25	624	1	0	568	45	0	0	2	45	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	28	701	1	0	638	51	0	0	2	51	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	689	0	0	702	0	0	1442	1447	703	1424	1422	665
Stage 1	-	-	-	-	-	-	758	758	-	664	664	-
Stage 2	-	-	-	-	-	-	684	689	-	760	758	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	730	-	-	542	-	-	141	156	391	157	174	456
Stage 1	-	-	-	-	-	-	487	455	-	567	515	-
Stage 2	-	-	-	-	-	-	533	485	-	507	475	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	730	-	-	542	-	-	125	150	391	151	167	456
Mov Cap-2 Maneuver	-	-	-	-	-	-	125	150	-	151	167	-
Stage 1	-	-	-	-	-	-	468	438	-	545	515	-
Stage 2	-	-	-	-	-	-	488	485	-	484	457	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	14.3	28.9
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	391	730	-	-	542	-	-	151	456
HCM Lane V/C Ratio	0.006	0.038	-	-	-	-	-	0.335	0.084
HCM Control Delay (s)	14.3	10.1	-	-	0	-	-	40.4	13.6
HCM Lane LOS	B	B	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1.4	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	541	44	62	504	6	101	2	71	4	3	2
Future Volume (vph)	3	541	44	62	504	6	101	2	71	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.454			0.303			0.754			0.704		
Satd. Flow (perm)	789	1667	1552	492	1558	1608	1302	1516	0	1305	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45			79			2
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	601	49	69	560	7	112	81	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	44.6	44.6	44.6	52.3	52.1	52.1	10.8	10.8		10.6	10.6	
Actuated g/C Ratio	0.64	0.64	0.64	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.57	0.05	0.14	0.48	0.01	0.56	0.27		0.02	0.02	
Control Delay	6.7	8.5	0.1	1.5	3.1	0.0	38.3	9.8		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	8.5	0.1	1.5	3.1	0.0	38.3	9.8		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		7.9			2.9			26.3			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	91	0	6	60	0	44	1		1	1	
Queue Length 95th (ft)	m1	m125	m0	1	11	m0	92	34		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	502	1062	1036	494	1160	1208	225	327		225	320	
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	0.01	0.57	0.05	0.14	0.48	0.01	0.50	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 8.2

Intersection LOS: A

Intersection Capacity Utilization 66.8%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	541	44	62	504	6	101	2	71	4	3	2
Future Volume (veh/h)	3	541	44	62	504	6	101	2	71	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	601	33	69	560	6	112	2	41	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	672	1191	1053	633	1169	1121	279	9	194	256	142	94
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	931	1947	1722	1640	1609	1542	1460	78	1609	1470	1175	784
Grp Volume(v), veh/h	3	601	33	69	560	6	112	0	43	4	0	5
Grp Sat Flow(s),veh/h/ln	931	1947	1722	1640	1609	1542	1460	0	1688	1470	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	5.1	0.0	1.6	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.9	0.0	0.0	5.1	0.0	1.6	1.3	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.40
Lane Grp Cap(c), veh/h	672	1191	1053	633	1169	1121	279	0	203	256	0	236
V/C Ratio(X)	0.00	0.50	0.03	0.11	0.48	0.01	0.40	0.00	0.21	0.02	0.00	0.02
Avail Cap(c_a), veh/h	672	1191	1053	749	1169	1121	355	0	292	333	0	339
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)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.2	0.0	0.0	29.3	0.0	28.2	28.2	0.0	27.3
Incr Delay (d2), s/veh	0.0	1.5	0.1	0.1	1.3	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.9	0.0	0.3	0.7	0.0	3.3	0.0	1.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.5	0.1	3.3	1.3	0.0	30.3	0.0	28.7	28.2	0.0	27.4
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	637		635				155		9			
Approach Delay, s/veh	1.4		1.5				29.8		27.7			
Approach LOS	A		A				C		C			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.1	48.6	13.3		56.7		13.3					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.4	2.5	3.8		2.5		7.6					
Green Ext Time (p_c), s	0.0	0.8	0.0		0.7		0.1					
Intersection Summary												
HCM 6th Ctrl Delay			4.7									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	468	13	5	540	12	9	0	14	6	0	8
Future Volume (vph)	25	468	13	5	540	12	9	0	14	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1660	0	1744	1654	1445	0	1729	0	1719	1501	0
Flt Permitted	0.367			0.473				0.866				
Satd. Flow (perm)	647	1660	0	868	1654	1415	0	1526	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				126		139			386	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	517	0	5	581	13	0	25	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.35		0.01	0.42	0.01		0.09		0.03	0.02	
Control Delay	0.8	2.6		3.6	5.0	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.8	2.6		3.6	5.0	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.5			4.9			0.7			11.5	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	76		m1	160	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	655	1493		726	1383	1204		325		242	535	
Starvation Cap Reductn	0	0		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	0.04	0.35		0.01	0.42	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 3.8

Intersection LOS: A

Intersection Capacity Utilization 46.4%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary 10: Driveway/Market Sq Dr & SR 0230

2024 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	468	13	5	540	12	9	0	14	6	0	8
Future Volume (veh/h)	25	468	13	5	540	12	9	0	14	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	27	503	14	5	581	13	10	0	14	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	700	1291	36	770	1298	1125	89	0	22	159	68	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1575	44	921	1793	1554	426	0	596	1361	1837	0
Grp Volume(v), veh/h	27	0	517	5	581	13	24	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1619	921	1793	1554	1021	0	0	1361	1837	0
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.42		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	700	0	1327	770	1298	1125	96	0	0	159	68	0
V/C Ratio(X)	0.04	0.00	0.39	0.01	0.45	0.01	0.25	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	799	0	1327	770	1298	1125	241	0	0	291	247	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)	0.81	0.00	0.81	0.91	0.91	0.91	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	0.0	0.0	0.0	0.0	0.0	34.0	0.0	0.0	32.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.0	1.0	0.0	1.3	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.5	0.0	0.7	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.7	0.0	1.0	0.0	35.3	0.0	0.0	32.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	544			599			24			6		
Approach Delay, s/veh	0.7			1.0			35.3			32.7		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.7	56.1	7.2		62.8		7.2					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.7	2.5	2.7		2.5		3.6					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				1.7								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	438	1	10	456	24	59	26	35	28	15	46
Future Volume (vph)	37	438	1	10	456	24	59	26	35	28	15	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1593	0	1248	1497	0	0	1793	0
Flt Permitted	0.445			0.472			0.772				0.869	
Satd. Flow (perm)	789	1685	0	619	1593	0	1014	1497	0	0	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6			38			49	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	472	0	11	516	0	63	66	0	0	95	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.5	52.5		52.5	52.5		10.9	10.9			10.9	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.07	0.37		0.02	0.43		0.40	0.25			0.33	
Control Delay	1.0	1.6		4.5	6.3		32.9	15.5			17.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.0	1.6		4.5	6.3		32.9	15.5			17.0	
LOS	A	A		A	A		C	B			B	
Approach Delay		1.6			6.3			24.0			17.0	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	7		1	77		25	11			18	
Queue Length 95th (ft)	3	17		7	171		55	39			52	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	591	1262		463	1195		289	454			487	
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	0.07	0.37		0.02	0.43		0.22	0.15			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 7.0

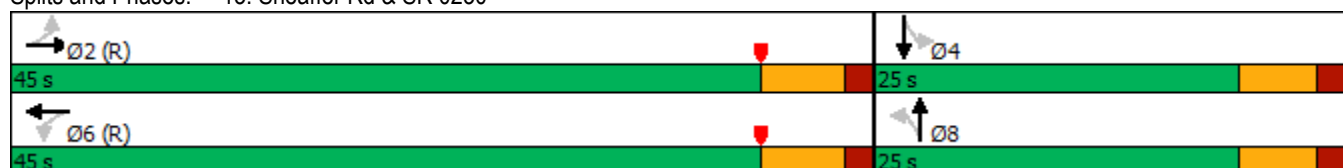
Intersection LOS: A

Intersection Capacity Utilization 52.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2024 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	438	1	10	456	24	59	26	35	28	15	46
Future Volume (veh/h)	37	438	1	10	456	24	59	26	35	28	15	46
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		0.99	1.00		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	40	471	0	11	490	25	63	28	16	30	16	31
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	657	1281	0	662	1314	67	216	97	55	114	43	58
Arrive On Green	1.00	1.00	0.00	0.76	0.76	0.75	0.10	0.10	0.08	0.08	0.10	0.08
Sat Flow, veh/h	829	1680	0	732	1723	88	1002	1009	577	440	450	600
Grp Volume(v), veh/h	40	471	0	11	0	515	63	0	44	77	0	0
Grp Sat Flow(s),veh/h/ln	829	1680	0	732	0	1811	1002	0	1586	1491	0	0
Q Serve(g_s), s	0.4	0.0	0.0	0.3	0.0	6.6	0.0	0.0	1.8	1.9	0.0	0.0
Cycle Q Clear(g_c), s	7.1	0.0	0.0	0.3	0.0	6.6	3.2	0.0	1.8	3.7	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.05	1.00		0.36	0.39		0.40
Lane Grp Cap(c), veh/h	657	1281	0	662	0	1381	216	0	152	193	0	0
V/C Ratio(X)	0.06	0.37	0.00	0.02	0.00	0.37	0.29	0.00	0.29	0.40	0.00	0.00
Avail Cap(c_a), veh/h	657	1281	0	662	0	1381	406	0	453	508	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	2.0	0.0	2.8	30.1	0.0	29.6	30.7	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.8	0.0	0.0	0.0	0.8	0.7	0.0	1.0	1.3	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(95%),veh/ln	0.1	0.5	0.0	0.0	0.0	2.2	1.8	0.0	1.3	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.8	0.0	2.0	0.0	3.5	30.8	0.0	30.6	32.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	511			526			107			77		
Approach Delay, s/veh	0.8			3.5			30.7			32.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	58.3			11.7			58.3			11.7		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			5.7			8.6			5.2		
Green Ext Time (p_c), s	14.0			0.1			14.5			0.3		

Intersection Summary

HCM 6th Ctrl Delay 6.5
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	385	0	87	550	150	0	0	206	56
Future Volume (vph)	0	0	0	385	0	87	550	150	0	0	206	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.448					
Satd. Flow (perm)	0	0	0	0	1546	1145	728	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	401	91	573	156	0	0	215	58
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.5	16.5	32.7	32.7			15.7	15.7
Actuated g/C Ratio					0.28	0.28	0.56	0.56			0.27	0.27
v/c Ratio					0.92	0.21	1.00	0.20			0.53	0.11
Control Delay					52.6	1.8	53.4	7.2			23.7	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					52.6	1.8	53.4	7.2			23.7	0.4
LOS					D	A	D	A			C	A
Approach Delay					43.3			43.5			18.7	
Approach LOS					D			D			B	
Queue Length 50th (ft)					141	0	127	24			64	0
Queue Length 95th (ft)					#294	7	#391	49			122	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2024 Build

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					434	439	572	824			442	551
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					0.92	0.21	1.00	0.19			0.49	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 38.9

Intersection LOS: D

Intersection Capacity Utilization 91.5%

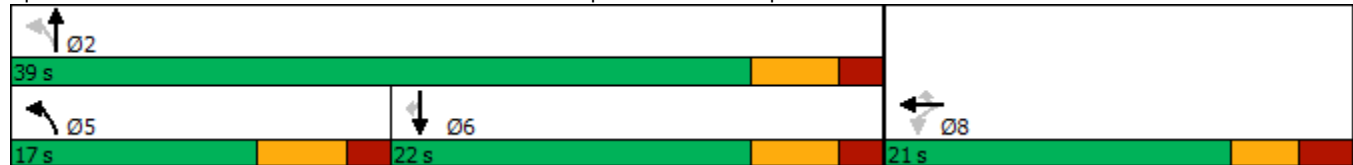
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	385	0	87	550	150	0	0	206	56
Future Volume (veh/h)	0	0	0	385	0	87	550	150	0	0	206	56
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				401	0	0	573	156	0	0	215	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				489	0		621	818	0	0	397	
Arrive On Green				0.26	0.00	0.00	0.22	0.55	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				401	0	0	573	156	0	0	215	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				11.5	0.0	0.0	12.0	2.9	0.0	0.0	6.2	0.0
Cycle Q Clear(g_c), s				11.5	0.0	0.0	12.0	2.9	0.0	0.0	6.2	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				489	0		621	818	0	0	397	
V/C Ratio(X)				0.82	0.00		0.92	0.19	0.00	0.00	0.54	
Avail Cap(c_a), veh/h				541	0		621	927	0	0	519	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.0	0.0	0.0	13.4	6.1	0.0	0.0	18.1	0.0
Incr Delay (d2), s/veh				8.9	0.0	0.0	19.5	0.4	0.0	0.0	4.1	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
%ile BackOfQ(50%),veh/ln				5.6	0.0	0.0	7.2	0.7	0.0	0.0	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.9	0.0	0.0	32.9	6.5	0.0	0.0	22.2	0.0
LnGrp LOS				C	A		C	A	A	A	C	
Approach Vol, veh/h					401			729			215	
Approach Delay, s/veh					27.9			27.3			22.2	
Approach LOS					C			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		19.4				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		4.9			14.0	8.2		13.5				
Green Ext Time (p_c), s		3.4			0.0	2.0		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				26.7								
HCM 6th LOS				C								

Notes

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

Lanes, Volumes, Timings

2024 Build

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	2	282	0	0	0	0	668	607	106	476	0
Future Volume (vph)	31	2	282	0	0	0	0	668	607	106	476	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1629	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1629	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	35	300	0	0	0	0	1357	0	113	506	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 91.5% ICU Level of Service F

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2024 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	31	2	282	0	0	0	0	668	607	106	476	0
Future Vol, veh/h	31	2	282	0	0	0	0	668	607	106	476	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	33	2	300	0	0	0	0	711	646	113	506	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1443	1443	506	-	0	0	711	0	0
Stage 1	732	732	-	-	-	-	-	-	-
Stage 2	711	711	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	138	170	602	0	-	-	705	-	0
Stage 1	571	486	-	0	-	-	-	-	0
Stage 2	583	495	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	116	0	602	-	-	-	705	-	-
Mov Cap-2 Maneuver	116	0	-	-	-	-	-	-	-
Stage 1	571	0	-	-	-	-	-	-	-
Stage 2	490	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.2	0	2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	116	602	705	-
HCM Lane V/C Ratio	-	-	0.303	0.498	0.16	-
HCM Control Delay (s)	-	-	49	16.8	11.1	-
HCM Lane LOS	-	-	E	C	B	-
HCM 95th %tile Q(veh)	-	-	1.2	2.8	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	24	0	1258	750	5
Future Volume (vph)	6	24	0	1258	750	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1624	0	0	1734	1652	0
Flt Permitted	0.990					
Satd. Flow (perm)	1624	0	0	1734	1652	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	0	0	1398	839	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	76.2%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	24	0	1258	750	5
Future Vol, veh/h	6	24	0	1258	750	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	27	0	1398	833	6

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2234	836	839	0	-	0
Stage 1	836	-	-	-	-	-
Stage 2	1398	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	50	386	672	-	-	-
Stage 1	475	-	-	-	-	-
Stage 2	250	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	50	386	672	-	-	-
Mov Cap-2 Maneuver	50	-	-	-	-	-
Stage 1	475	-	-	-	-	-
Stage 2	250	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.3	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	672	-	165	-	-
HCM Lane V/C Ratio	-	-	0.202	-	-
HCM Control Delay (s)	0	-	32.3	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	19	104	8	12	74	41	848	8	10	628	149
Future Volume (vph)	336	19	104	8	12	74	41	848	8	10	628	149
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1567	0	1391	1565	0	1500	1616	0	1628	1580	0
Flt Permitted	0.695			0.669			0.146			0.101		
Satd. Flow (perm)	1173	1567	0	978	1565	0	231	1616	0	173	1580	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		116			82			1			28	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	373	137	0	9	95	0	46	951	0	11	864	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.11	0.26		0.03	0.19		0.35	1.04		0.11	0.96	
Control Delay	111.4	7.2		18.6	7.4		13.4	54.1		10.5	37.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	111.4	7.2		18.6	7.4		13.4	54.1		10.5	37.8	
LOS	F	A		B	A		B	D		B	D	
Approach Delay		83.4			8.4			52.2			37.4	
Approach LOS		F			A			D			D	
Queue Length 50th (ft)	~188	7		3	4		5	~457		2	312	
Queue Length 95th (ft)	#343	44		13	35		m11	#665		10	#585	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	335	530		279	505		130	912		97	903	
Starvation Cap Reductn	0	0		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	1.11	0.26		0.03	0.19		0.35	1.04		0.11	0.96	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 51.6

Intersection LOS: D

Intersection Capacity Utilization 82.7%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

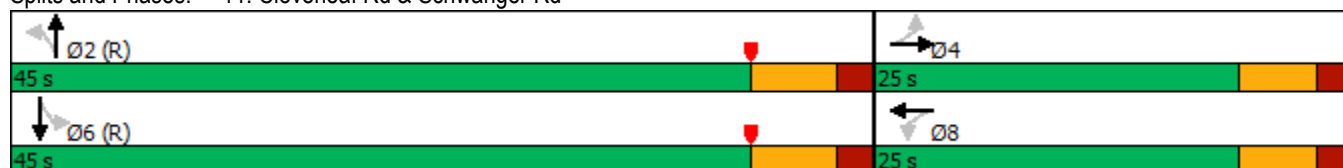
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2024 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	19	104	8	12	74	41	848	8	10	628	149
Future Volume (veh/h)	336	19	104	8	12	74	41	848	8	10	628	149
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	373	21	116	9	13	82	46	942	9	11	698	166
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	423	78	433	339	58	363	187	995	10	450	796	189
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1360	274	1515	1048	201	1270	615	1764	17	615	1411	336
Grp Volume(v), veh/h	373	0	137	9	0	95	46	0	951	11	0	864
Grp Sat Flow(s),veh/h/ln	1360	0	1790	1048	0	1472	615	0	1781	615	0	1746
Q Serve(g_s), s	16.5	0.0	4.2	0.5	0.0	3.5	4.6	0.0	0.0	0.6	0.0	29.9
Cycle Q Clear(g_c), s	20.0	0.0	4.2	4.7	0.0	3.5	34.5	0.0	0.0	0.6	0.0	29.9
Prop In Lane	1.00		0.85	1.00		0.86	1.00		0.01	1.00		0.19
Lane Grp Cap(c), veh/h	423	0	511	339	0	420	187	0	1005	450	0	985
V/C Ratio(X)	0.88	0.00	0.27	0.03	0.00	0.23	0.25	0.00	0.95	0.02	0.00	0.88
Avail Cap(c_a), veh/h	423	0	511	339	0	420	187	0	1005	450	0	985
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	19.7	21.2	0.0	19.4	13.1	0.0	0.0	6.8	0.0	13.2
Incr Delay (d2), s/veh	18.9	0.0	0.3	0.0	0.0	0.3	2.1	0.0	13.4	0.1	0.0	10.9
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	8.3	0.0	1.7	0.1	0.0	1.1	0.6	0.0	3.7	0.1	0.0	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	20.0	21.2	0.0	19.7	15.1	0.0	13.4	6.9	0.0	24.1
LnGrp LOS	D	A	B	C	A	B	B	A	B	A	A	C
Approach Vol, veh/h	510			104			997			875		
Approach Delay, s/veh	39.6			19.8			13.5			23.9		
Approach LOS	D			B			B			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			31.9			6.7		
Green Ext Time (p_c), s	30.2			0.0			6.0			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	22.8											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	16	16	1	9	2	861	7	24	693	7
Future Volume (vph)	35	0	16	16	1	9	2	861	7	24	693	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1682	0	0	1561	0	0	1614	1648
Flt Permitted		0.740			0.787			0.999			0.961	
Satd. Flow (perm)	0	1288	1581	0	1366	0	0	1560	0	0	1554	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		9			1				39
Link Speed (mph)		25			25			40				40
Link Distance (ft)		750			1000			600				1240
Travel Time (s)		20.5			27.3			10.2				21.1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	17	0	27	0	0	906	0	0	747	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		8.6	8.6		8.5			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.23	0.07		0.16			0.70			0.58	0.01
Control Delay		30.4	2.4		22.5			9.5			9.4	0.6
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		30.4	2.4		22.5			9.5			9.4	0.6
LOS		C	A		C			A			A	A
Approach Delay		21.5			22.5			9.5			9.3	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		14	0		7			179			243	0
Queue Length 95th (ft)		38	4		27			#539			m279	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		230	320		251			1302			1297	1382
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		0.16	0.05		0.11			0.70			0.58	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 10.0

Intersection LOS: B

Intersection Capacity Utilization 73.9%

ICU Level of Service D

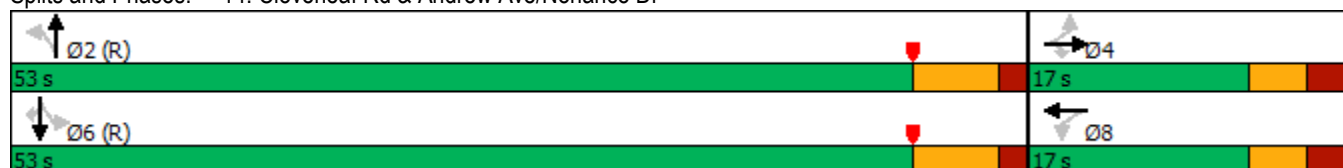
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	16	16	1	9	2	861	7	24	693	7
Future Volume (veh/h)	35	0	16	16	1	9	2	861	7	24	693	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	36	0	17	17	1	9	2	897	7	25	722	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	205	0	101	119	8	21	52	1298	10	73	1339	1322
Arrive On Green	0.05	0.00	0.06	0.05	0.06	0.05	0.79	0.80	0.79	1.00	1.00	1.00
Sat Flow, veh/h	1601	0	1586	545	120	333	1	1621	13	24	1673	1652
Grp Volume(v), veh/h	36	0	17	27	0	0	906	0	0	747	0	7
Grp Sat Flow(s),veh/h/ln	1601	0	1586	998	0	0	1634	0	0	1697	0	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.7	2.4	0.0	0.0	17.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.63		0.33	0.00		0.01	0.03		1.00
Lane Grp Cap(c), veh/h	182	0	101	133	0	0	1336	0	0	1387	0	1322
V/C Ratio(X)	0.20	0.00	0.17	0.20	0.00	0.00	0.68	0.00	0.00	0.54	0.00	0.01
Avail Cap(c_a), veh/h	337	0	283	302	0	0	1336	0	0	1387	0	1322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.21	0.00	0.21
Uniform Delay (d), s/veh	31.8	0.0	31.0	32.5	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	0.7	0.0	0.0	2.8	0.0	0.0	0.3	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	0.6	0.0	0.3	0.5	0.0	0.0	2.7	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	0.0	31.8	33.3	0.0	0.0	6.0	0.0	0.0	0.3	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	53			27			906			754		
Approach Delay, s/veh	32.2			33.3			6.0			0.3		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	61.0			9.0			61.0			9.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	47.0			11.5			47.0			11.5		
Max Q Clear Time (g_c+I1), s	19.8			3.4			2.0			4.4		
Green Ext Time (p_c), s	22.2			0.1			27.5			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	4.7											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	241	37	52	238	198	72	369	51	106	210	184
Future Volume (vph)	275	241	37	52	238	198	72	369	51	106	210	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1684	0	1500	1509	1388
Flt Permitted	0.320			0.601			0.573			0.223		
Satd. Flow (perm)	500	1660	1088	754	1649	1561	988	1684	0	352	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		8				232
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1026			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	293	256	39	55	253	211	77	447	0	113	223	196
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	30.8	30.8	30.8	15.6	15.6	15.6	27.8	21.7		27.9	21.8	21.8
Actuated g/C Ratio	0.41	0.41	0.41	0.21	0.21	0.21	0.37	0.29		0.37	0.29	0.29
v/c Ratio	0.89	0.38	0.07	0.35	0.74	0.41	0.18	0.90		0.45	0.51	0.35
Control Delay	49.3	18.2	0.3	33.5	42.6	5.4	14.0	52.0		19.5	28.8	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	49.3	18.2	0.3	33.5	42.6	5.4	14.0	52.0		19.5	28.8	4.0
LOS	D	B	A	C	D	A	B	D		B	C	A
Approach Delay		32.5			26.5			46.4			17.7	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	104	86	0	23	116	0	21	210		31	92	0
Queue Length 95th (ft)	#251	145	0	57	#212	39	47	#405		64	166	32

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	331	739	567	183	401	560	437	494		255	439	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.89	0.35	0.07	0.30	0.63	0.38	0.18	0.90		0.44	0.51	0.35

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 74.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 30.8

Intersection LOS: C

Intersection Capacity Utilization 78.4%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	241	37	52	238	198	72	369	51	106	210	184
Future Volume (veh/h)	275	241	37	52	238	198	72	369	51	106	210	184
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	293	256	26	55	253	0	77	393	52	113	223	166
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	373	685	483	249	328		414	467	62	290	444	392
Arrive On Green	0.13	0.40	0.40	0.19	0.19	0.00	0.06	0.26	0.25	0.09	0.29	0.29
Sat Flow, veh/h	1641	1709	1206	779	1724	1532	1988	1788	237	1522	1528	1352
Grp Volume(v), veh/h	293	256	26	55	253	0	77	0	445	113	223	166
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	779	1724	1532	1988	0	2024	1522	1528	1352
Q Serve(g_s), s	9.5	7.5	0.9	4.4	9.9	0.0	1.9	0.0	14.8	3.7	8.6	7.1
Cycle Q Clear(g_c), s	9.5	7.5	0.9	4.4	9.9	0.0	1.9	0.0	14.8	3.7	8.6	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	373	685	483	249	328		414	0	529	290	444	392
V/C Ratio(X)	0.79	0.37	0.05	0.22	0.77		0.19	0.00	0.84	0.39	0.50	0.42
Avail Cap(c_a), veh/h	373	792	559	298	436		512	0	611	321	461	408
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	15.0	13.1	25.1	27.4	0.0	17.2	0.0	25.0	17.7	21.0	20.4
Incr Delay (d2), s/veh	10.6	0.1	0.0	0.2	4.1	0.0	0.2	0.0	9.1	0.9	0.9	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	4.3	2.5	0.2	0.7	4.1	0.0	0.9	0.0	8.2	1.2	2.9	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	15.2	13.1	25.3	31.5	0.0	17.4	0.0	34.1	18.6	21.9	21.2
LnGrp LOS	C	B	B	C	C		B	A	C	B	C	C
Approach Vol, veh/h	575			308			522			502		
Approach Delay, s/veh	22.8			30.4			31.6			20.9		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	19.0	12.6	24.6		34.0	10.5	26.7				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	12.4	6.2	16.8		10.0	4.4	11.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8		0.1	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay	25.9
HCM 6th LOS	C

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	155	0	762	15	183	500	0
Future Volume (vph)	0	0	0	0	0	155	0	762	15	183	500	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1640	1489	1787	1745	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1640	1489	1787	1745	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	10%	2%
Shared Lane Traffic (%)									10%			
Lane Group Flow (vph)	0	0	0	0	0	172	0	849	15	203	556	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.2%

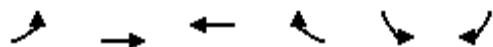
ICU Level of Service B

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2024 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↗	↗	↗	↗	
Traffic Vol, veh/h	0	0	0	0	0	155	0	762	15	183	500	0
Future Vol, veh/h	0	0	0	0	0	155	0	762	15	183	500	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	9	2	2	10	2
Mvmt Flow	0	0	0	0	0	172	0	847	17	203	556	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	556	-	-	847	-	0	0	864	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	-	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.1	-	-	3.318	-	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	559	0	0	362	0	-	-	660	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	559	-	-	362	-	-	-	660	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		23.6		0		3.4					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBL	SBT	SBR			
Capacity (veh/h)	-		-		-		362	660	-		-	
HCM Lane V/C Ratio	-		-		-		0.476	0.308	-		-	
HCM Control Delay (s)	-		-		0		23.6	12.9	-		-	
HCM Lane LOS	-		-		A		C	B	-		-	
HCM 95th %tile Q(veh)	-		-		-		2.5	1.3	-		-	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	113	285	387	51	65	141
Future Volume (vph)	113	285	387	51	65	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			325	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1805	1743	1810	1583	1664	0
Flt Permitted	0.950				0.985	
Satd. Flow (perm)	1805	1743	1810	1583	1664	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2697		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	9%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	126	317	430	57	229	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.9% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	113	285	387	51	65	141
Future Vol, veh/h	113	285	387	51	65	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	350	-	-	325	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	9	5	2	2	2
Mvmt Flow	126	317	430	57	72	157
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	487	0	-	0	999	430
Stage 1	-	-	-	-	430	-
Stage 2	-	-	-	-	569	-
Critical Hdwy	4.5	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	794	-	-	-	298	661
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	640	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	794	-	-	-	251	661
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	640	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.9	0		16.1		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	794	-	-	-	551	
HCM Lane V/C Ratio	0.158	-	-	-	0.415	
HCM Control Delay (s)	10.4	-	-	-	16.1	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0.6	-	-	-	2	

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2024 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	323	439	23	25	3
Future Volume (vph)	3	323	439	23	25	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1725	0	1550	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1725	0	1550	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	355	507	0	30	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	323	439	23	25	3
Future Vol, veh/h	3	323	439	23	25	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	355	482	25	27	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	507	0	-	0	856	495
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	361	-
Critical Hdwy	4.4	-	-	-	6.84	6.7
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	3.3	-	-	-	3	3.4
Pot Cap-1 Maneuver	734	-	-	-	330	528
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	734	-	-	-	329	528
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	774	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.1		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	734	-	-	-	477	
HCM Lane V/C Ratio	0.004	-	-	-	0.065	
HCM Control Delay (s)	9.9	-	-	-	13.1	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2024 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	22	33	6	43	119	46	336	9	31	189	77
Future Volume (vph)	69	22	33	6	43	119	46	336	9	31	189	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1300	0	0	1537	0	0	1665	0	0	1514	0
Flt Permitted		0.973			0.998			0.994			0.995	
Satd. Flow (perm)	0	1300	0	0	1537	0	0	1665	0	0	1514	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	0	175	0	0	407	0	0	309	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	55.4%											
Analysis Period (min)	15											
ICU Level of Service B												

Intersection	
Intersection Delay, s/veh	15.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	69	22	33	6	43	119	46	336	9	31	189	77
Future Vol, veh/h	69	22	33	6	43	119	46	336	9	31	189	77
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	72	23	34	6	45	124	48	350	9	32	197	80
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.6	11.3	18.7	15.3
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	56%	4%	10%
Vol Thru, %	86%	18%	26%	64%
Vol Right, %	2%	27%	71%	26%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	391	124	168	297
LT Vol	46	69	6	31
Through Vol	336	22	43	189
RT Vol	9	33	119	77
Lane Flow Rate	407	129	175	309
Geometry Grp	1	1	1	1
Degree of Util (X)	0.646	0.255	0.284	0.514
Departure Headway (Hd)	5.71	7.107	5.851	5.983
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	631	502	609	600
Service Time	3.777	5.201	3.939	4.057
HCM Lane V/C Ratio	0.645	0.257	0.287	0.515
HCM Control Delay	18.7	12.6	11.3	15.3
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	4.7	1	1.2	2.9

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	701	85	206	542	122	137
Future Volume (vph)	701	85	206	542	122	137
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1801	0	1744	1958	1578	0
Flt Permitted			0.089		0.977	
Satd. Flow (perm)	1801	0	163	1958	1578	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	11					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	863	0	226	596	285	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	0.93		0.84	0.46	0.86	
Control Delay	37.6		36.9	7.3	57.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	37.6		36.9	7.3	57.0	
LOS	D		D	A	E	
Approach Delay	37.6			15.5	57.0	
Approach LOS	D			B	E	
Queue Length 50th (ft)	377		52	128	138	
Queue Length 95th (ft)	#641		m#105	m158	#273	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	923		268	1292	331	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.93		0.84	0.46	0.86	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 84.5%	ICU Level of Service E
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	46 s	22 s
↖ Ø6 (R)		
58 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2024 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	701	85	206	542	122	137
Future Volume (veh/h)	701	85	206	542	122	137
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	770	84	226	596	134	151
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	811	88	295	1391	159	180
Arrive On Green	0.53	0.51	0.18	1.00	0.20	0.19
Sat Flow, veh/h	1537	168	1914	2090	779	878
Grp Volume(v), veh/h	0	854	226	596	286	0
Grp Sat Flow(s),veh/h/ln	0	1705	1914	2090	1663	0
Q Serve(g_s), s	0.0	38.0	4.0	0.0	13.2	0.0
Cycle Q Clear(g_c), s	0.0	38.0	4.0	0.0	13.2	0.0
Prop In Lane		0.10	1.00		0.47	0.53
Lane Grp Cap(c), veh/h	0	899	295	1391	340	0
V/C Ratio(X)	0.00	0.95	0.77	0.43	0.84	0.00
Avail Cap(c_a), veh/h	0	899	318	1391	349	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	17.9	16.0	0.0	30.8	0.0
Incr Delay (d2), s/veh	0.0	20.0	9.9	1.0	20.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	24.6	4.8	0.7	11.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	38.0	25.9	1.0	51.0	0.0
LnGrp LOS	A	D	C	A	D	A
Approach Vol, veh/h	854			822	286	
Approach Delay, s/veh	38.0			7.8	51.0	
Approach LOS	D			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.0	47.4		21.6		58.4
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	6.0	40.0		15.2		2.0
Green Ext Time (p_c), s	0.1	0.0		0.1		19.1
Intersection Summary						
HCM 6th Ctrl Delay			27.2			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	874	0	0	1020	92	1	0	2	35	0	48
Future Volume (vph)	27	874	0	0	1020	92	1	0	2	35	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	940	0	0	1196	0	0	3	0	38	52	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 71.1% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	874	0	0	1020	92	1	0	2	35	0	48
Future Vol, veh/h	27	874	0	0	1020	92	1	0	2	35	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	29	940	0	0	1097	99	1	0	2	38	0	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1196	0	0	940	0	0	2172	2194	940	2146	2145	1148
Stage 1	-	-	-	-	-	-	998	998	-	1147	1147	-
Stage 2	-	-	-	-	-	-	1174	1196	-	999	998	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	555	-	-	412	-	-	46	58	354	53	70	279
Stage 1	-	-	-	-	-	-	364	362	-	323	334	-
Stage 2	-	-	-	-	-	-	293	299	-	384	383	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	555	-	-	412	-	-	36	55	354	51	66	279
Mov Cap-2 Maneuver	-	-	-	-	-	-	36	55	-	51	66	-
Stage 1	-	-	-	-	-	-	345	343	-	306	334	-
Stage 2	-	-	-	-	-	-	239	299	-	362	363	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	46.5	88.2
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	90	555	-	-	412	-	-	51	279
HCM Lane V/C Ratio	0.036	0.052	-	-	-	-	-	0.738	0.185
HCM Control Delay (s)	46.5	11.8	-	-	0	-	-	180.7	20.8
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	3	0.7

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	684	36	151	827	17	267	3	115	23	8	16
Future Volume (vph)	14	684	36	151	827	17	267	3	115	23	8	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1747	0
Flt Permitted	0.267			0.148			0.741			0.678		
Satd. Flow (perm)	464	1766	1550	245	1697	1608	1316	1576	0	1257	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40		120			17	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	713	38	157	861	18	278	123	0	24	25	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.8	37.8	37.8	51.9	50.6	50.6	18.7	18.7		18.7	18.7	
Actuated g/C Ratio	0.47	0.47	0.47	0.65	0.63	0.63	0.23	0.23		0.23	0.23	
v/c Ratio	0.07	0.85	0.05	0.53	0.80	0.02	0.90	0.27		0.08	0.06	
Control Delay	12.1	21.0	0.2	15.4	8.8	0.1	63.8	7.1		24.6	14.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	12.1	21.0	0.2	15.4	8.8	0.1	63.8	7.1		24.6	14.4	
LOS	B	C	A	B	A	A	E	A		C	B	
Approach Delay		19.8			9.6			46.4			19.4	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	3	145	0	7	26	0	135	1		9	3	
Queue Length 95th (ft)	m4	m221	m0	m44	#61	m0	#273	41		28	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	218	834	792	299	1072	1030	314	467		300	430	
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	0.07	0.85	0.05	0.53	0.80	0.02	0.89	0.26		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 19.8

Intersection LOS: B

Intersection Capacity Utilization 94.5%

ICU Level of Service F

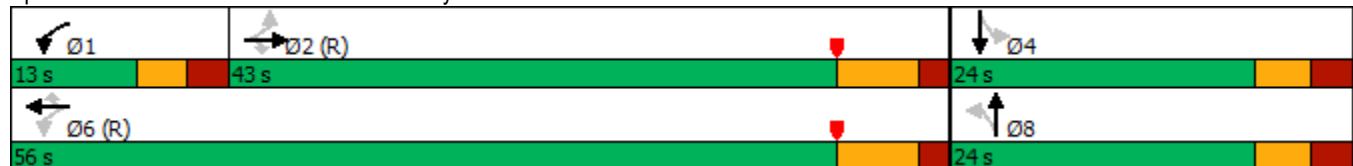
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	684	36	151	827	17	267	3	115	23	8	16
Future Volume (veh/h)	14	684	36	151	827	17	267	3	115	23	8	16
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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	15	712	23	157	861	15	278	3	80	24	8	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	437	1011	868	561	1106	983	422	14	372	366	157	274
Arrive On Green	1.00	1.00	1.00	0.17	1.00	1.00	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	697	2032	1745	1666	1736	1542	1470	61	1624	1418	684	1198
Grp Volume(v), veh/h	15	712	23	157	861	15	278	0	83	24	0	22
Grp Sat Flow(s),veh/h/ln	697	2032	1745	1666	1736	1542	1470	0	1685	1418	0	1882
Q Serve(g_s), s	0.0	0.4	0.0	3.3	0.0	0.0	14.4	0.0	3.2	1.1	0.0	0.7
Cycle Q Clear(g_c), s	0.0	0.4	0.0	3.3	0.0	0.0	14.7	0.0	3.2	3.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.64
Lane Grp Cap(c), veh/h	437	1011	868	561	1106	983	422	0	386	366	0	431
V/C Ratio(X)	0.03	0.70	0.03	0.28	0.78	0.02	0.66	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	437	1011	868	600	1106	983	437	0	402	380	0	449
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)	1.00	1.00	1.00	0.66	0.66	0.66	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.1	0.1	0.1	6.1	0.0	0.0	29.6	0.0	25.4	26.4	0.0	24.3
Incr Delay (d2), s/veh	0.1	4.1	0.1	0.2	3.6	0.0	3.5	0.0	0.3	0.1	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(95%),veh/ln	0.0	2.2	0.0	1.5	2.0	0.0	9.2	0.0	2.4	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	4.2	0.1	6.3	3.6	0.0	33.0	0.0	25.7	26.5	0.0	24.4
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	750			1033			361			46		
Approach Delay, s/veh	4.0			4.0			31.3			25.5		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	11.2	45.6	23.2			56.8	23.2					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2	* 18					
Max Q Clear Time (g_c+I1), s	5.8	2.9	6.3			2.5	17.2					
Green Ext Time (p_c), s	0.1	0.9	0.1			1.1	0.1					

Intersection Summary

HCM 6th Ctrl Delay 8.9
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	513	1	10	832	73	9	2	1	41	3	111
Future Volume (vph)	84	513	1	10	832	73	9	2	1	41	3	111
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%				-1%
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.186			0.462				0.721		0.750		
Satd. Flow (perm)	328	1729	0	771	1818	1561	0	1364	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			117	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	541	0	11	876	77	0	12	0	43	120	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	64.0	64.2		55.4	55.4	55.4		9.2		9.2	9.2	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.24	0.39		0.02	0.70	0.07		0.08		0.28	0.44	
Control Delay	3.5	6.6		4.3	12.4	0.4		30.1		36.1	12.3	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0		0.0	0.0	
Total Delay	3.5	6.6		4.3	12.5	0.4		30.1		36.1	12.3	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		6.2			11.5			30.1			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	9	157		1	341	1		5		20	1	
Queue Length 95th (ft)	m15	m253		m2	#477	m1		20		48	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	371	1386		533	1258	1114		229		227	349	
Starvation Cap Reductn	0	0		0	39	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	0.24	0.39		0.02	0.72	0.07		0.05		0.19	0.34	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 10.4

Intersection LOS: B

Intersection Capacity Utilization 70.8%

ICU Level of Service C

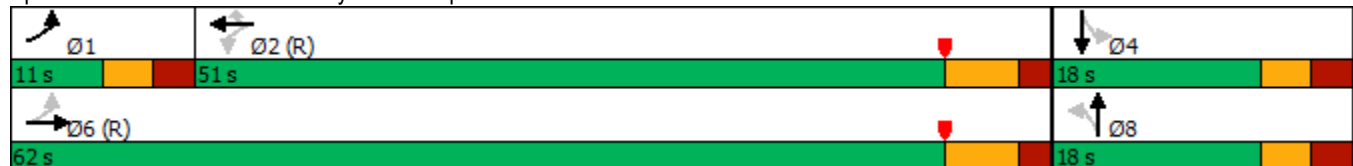
Analysis Period (min) 15

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.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2024 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	513	1	10	832	73	9	2	1	41	3	111
Future Volume (veh/h)	84	513	1	10	832	73	9	2	1	41	3	111
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	88	540	1	11	876	68	9	2	0	43	3	61
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	549	1343	2	669	1341	1145	112	19	0	205	5	110
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.06	0.07	0.00	0.07	0.07	0.06
Sat Flow, veh/h	1629	1679	3	835	1935	1652	406	255	0	1376	72	1472
Grp Volume(v), veh/h	88	0	541	11	876	68	11	0	0	43	0	64
Grp Sat Flow(s),veh/h/ln	1629	0	1682	835	1935	1652	661	0	0	1376	0	1544
Q Serve(g_s), s	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	1.9	0.0	3.2
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.95
Lane Grp Cap(c), veh/h	549	0	1346	669	1341	1145	123	0	0	205	0	116
V/C Ratio(X)	0.16	0.00	0.40	0.02	0.65	0.06	0.09	0.00	0.00	0.21	0.00	0.55
Avail Cap(c_a), veh/h	599	0	1346	669	1341	1145	253	0	0	333	0	259
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)	0.45	0.00	0.45	0.69	0.69	0.69	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.9	0.0	0.0	35.1	0.0	36.2
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.7	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.2	0.0	0.4	0.0	0.0	1.5	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.1	0.0	0.4	0.0	1.7	0.1	35.2	0.0	0.0	35.6	0.0	40.3
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	629			955			11			107		
Approach Delay, s/veh	0.6			1.6			35.2			38.4		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	8.6	60.9	10.6			69.4		10.6				
Change Period (Y+Rc), s	5.5	6.4	5.6			6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6	12.4			55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.5	2.5	5.2			2.5		5.2				
Green Ext Time (p_c), s	0.0	1.2	0.2			0.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	3.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	462	21	40	721	32	91	35	29	33	43	93
Future Volume (vph)	62	462	21	40	721	32	91	35	29	33	43	93
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1712	0	1573	1679	0	1572	1604	0	0	1801	0
Flt Permitted	0.276			0.439			0.522				0.921	
Satd. Flow (perm)	480	1712	0	726	1679	0	863	1604	0	0	1675	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			4			31			83	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	508	0	42	793	0	96	68	0	0	178	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	56.3	56.3		56.3	56.3		13.8	13.8			13.8	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.17	0.17			0.17	
v/c Ratio	0.19	0.42		0.08	0.67		0.65	0.23			0.50	
Control Delay	1.9	1.6		5.5	11.5		49.7	18.0			20.1	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0			0.0	
Total Delay	1.9	1.6		5.5	11.6		49.7	18.0			20.1	
LOS	A	A		A	B		D	B			C	
Approach Delay		1.6			11.3			36.6			20.1	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	1	8		6	184		45	16			42	
Queue Length 95th (ft)	2	10		20	407		88	45			91	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	337	1206		510	1182		291	561			620	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	42		0	0			2	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.19	0.42		0.08	0.70		0.33	0.12			0.29	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.4

Intersection LOS: B

Intersection Capacity Utilization 82.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)	 Ø4
48 s	32 s
 Ø6 (R)	 Ø8
48 s	32 s

HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2024 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	462	21	40	721	32	91	35	29	33	43	93
Future Volume (veh/h)	62	462	21	40	721	32	91	35	29	33	43	93
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	65	486	21	42	759	32	96	37	13	35	45	77
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	442	1208	52	753	1344	57	232	160	56	92	81	113
Arrive On Green	1.00	1.00	1.00	0.74	0.74	0.73	0.13	0.13	0.12	0.12	0.13	0.12
Sat Flow, veh/h	631	1625	70	891	1808	76	1185	1206	424	275	608	850
Grp Volume(v), veh/h	65	0	507	42	0	791	96	0	50	157	0	0
Grp Sat Flow(s),veh/h/ln	631	0	1695	891	0	1884	1185	0	1629	1734	0	0
Q Serve(g_s), s	2.4	0.0	0.0	1.0	0.0	14.9	0.3	0.0	2.2	4.3	0.0	0.0
Cycle Q Clear(g_c), s	17.3	0.0	0.0	1.0	0.0	14.9	7.2	0.0	2.2	6.9	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.04	1.00		0.26	0.22		0.49
Lane Grp Cap(c), veh/h	442	0	1260	753	0	1400	232	0	217	264	0	0
V/C Ratio(X)	0.15	0.00	0.40	0.06	0.00	0.56	0.41	0.00	0.23	0.60	0.00	0.00
Avail Cap(c_a), veh/h	442	0	1260	753	0	1400	475	0	550	611	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)	0.93	0.00	0.93	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.2	0.0	0.0	2.8	0.0	4.6	33.2	0.0	31.1	33.4	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.9	0.1	0.0	1.7	1.2	0.0	0.5	2.1	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(95%),veh/ln	0.3	0.0	0.6	0.2	0.0	7.0	3.2	0.0	1.6	5.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.8	0.0	0.9	2.9	0.0	6.2	34.4	0.0	31.7	35.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	572				833				146			
Approach Delay, s/veh	1.1				6.0				33.5			
Approach LOS	A				A				C			
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	64.4			15.6			64.4			15.6		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			8.9			16.9			9.2		
Green Ext Time (p_c), s	15.5			0.4			19.1			0.4		

Intersection Summary

HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings

2024 Build

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	634	0	121	327	164	0	0	246	47
Future Volume (vph)	0	0	0	634	0	121	327	164	0	0	246	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.370					
Satd. Flow (perm)	0	0	0	0	1653	1414	619	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	667	127	344	173	0	0	259	49
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.5	25.5	29.1	29.1			16.1	16.1
Actuated g/C Ratio					0.40	0.40	0.45	0.45			0.25	0.25
v/c Ratio					1.01	0.19	0.86	0.25			0.62	0.09
Control Delay					61.9	2.8	36.8	11.9			28.8	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					61.9	2.8	36.8	11.9			28.8	0.4
LOS					E	A	D	B			C	A
Approach Delay					52.4			28.5			24.3	
Approach LOS					D			C			C	
Queue Length 50th (ft)					~273	0	89	39			90	0
Queue Length 95th (ft)					#476	22	#213	76			159	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					658	653	402	707			440	539
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					1.01	0.19	0.86	0.24			0.59	0.09

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 64.1

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 39.4

Intersection LOS: D

Intersection Capacity Utilization 138.2%

ICU Level of Service H

Analysis Period (min) 15

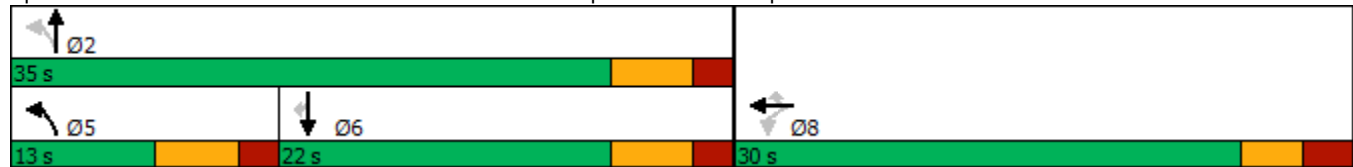
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	634	0	121	327	164	0	0	246	47
Future Volume (veh/h)	0	0	0	634	0	121	327	164	0	0	246	47
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				667	0	0	344	173	0	0	259	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				734	0		425	682	0	0	386	
Arrive On Green				0.39	0.00	0.00	0.13	0.43	0.00	0.00	0.22	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				667	0	0	344	173	0	0	259	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				21.3	0.0	0.0	8.0	4.2	0.0	0.0	8.0	0.0
Cycle Q Clear(g_c), s				21.3	0.0	0.0	8.0	4.2	0.0	0.0	8.0	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				734	0		425	682	0	0	386	
V/C Ratio(X)				0.91	0.00		0.81	0.25	0.00	0.00	0.67	
Avail Cap(c_a), veh/h				755	0		425	787	0	0	504	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.2	0.0	0.0	17.4	10.9	0.0	0.0	21.7	0.0
Incr Delay (d2), s/veh				14.7	0.0	0.0	11.2	0.7	0.0	0.0	7.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				16.3	0.0	0.0	7.8	2.4	0.0	0.0	6.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.9	0.0	0.0	28.6	11.7	0.0	0.0	28.9	0.0
LnGrp LOS				C	A		C	B	A	A	C	
Approach Vol, veh/h					667			517			259	
Approach Delay, s/veh					31.9			22.9			28.9	
Approach LOS					C			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		29.3				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		24.5				
Max Q Clear Time (g_c+I1), s		6.2			10.0	10.0		23.3				
Green Ext Time (p_c), s		3.4			0.0	2.0		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				28.1								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	3	543	0	0	0	0	452	509	97	790	0
Future Volume (vph)	43	3	543	0	0	0	0	452	509	97	790	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1564	1569	0	0	0	0	1665	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1564	1569	0	0	0	0	1665	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	560	0	0	0	0	991	0	100	814	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 138.2% ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2024 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	42.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	43	3	543	0	0	0	0	452	509	97	790	0
Future Vol, veh/h	43	3	543	0	0	0	0	452	509	97	790	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	44	3	560	0	0	0	0	466	525	100	814	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1480	1480	814	-	0	0	466	0	0
Stage 1	1014	1014	-	-	-	-	-	-	-
Stage 2	466	466	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	129	162	~ 425	0	-	-	840	-	0
Stage 1	419	377	-	0	-	-	-	-	0
Stage 2	720	611	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	114	0	~ 425	-	-	-	840	-	-
Mov Cap-2 Maneuver	114	0	-	-	-	-	-	-	-
Stage 1	419	0	-	-	-	-	-	-	-
Stage 2	634	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	175.4	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	114	425	840	-
HCM Lane V/C Ratio	-	-	0.416	1.317	0.119	-
HCM Control Delay (s)	-	-	57.4	185.4	9.9	-
HCM Lane LOS	-	-	F	F	A	-
HCM 95th %tile Q(veh)	-	-	1.8	25.2	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	946	1306	10
Future Volume (vph)	3	9	8	946	1306	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1801	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	983	1356	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	79.3%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	946	1306	10
Future Vol, veh/h	3	9	8	946	1306	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	975	1346	10
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2342	1351	1356	0	-	0
Stage 1	1351	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	42	192	461	-	-	-
Stage 1	264	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	40	192	461	-	-	-
Mov Cap-2 Maneuver	40	-	-	-	-	-
Stage 1	254	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	47	0.1		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	461	-	98	-	-	
HCM Lane V/C Ratio	0.018	-	0.126	-	-	
HCM Control Delay (s)	13	0	47	-	-	
HCM Lane LOS	B	A	E	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	33	95	9	40	35	78	706	13	49	951	319
Future Volume (vph)	218	33	95	9	40	35	78	706	13	49	951	319
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1670	0	1416	1704	0	1620	1694	0	1628	1678	0
Flt Permitted	0.706			0.671			0.107			0.269		
Satd. Flow (perm)	1204	1670	0	1000	1704	0	182	1694	0	461	1678	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		100			37			3			54	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	229	135	0	9	79	0	82	757	0	52	1337	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	0.95	0.33		0.04	0.21		0.73	0.71		0.18	1.25	
Control Delay	76.8	10.3		20.2	14.2		44.3	15.1		6.7	137.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	76.8	10.3		20.2	14.2		44.3	15.1		6.7	137.5	
LOS	E	B		C	B		D	B		A	F	
Approach Delay		52.1			14.8			17.9			132.6	
Approach LOS		D			B			B			F	
Queue Length 50th (ft)	82	10		3	13		38	346		7	~624	
Queue Length 95th (ft)	#202	50		13	43		m#65	356		21	#854	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	414		200	370		113	1059		288	1069	
Starvation Cap Reductn	0	0		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	0.95	0.33		0.04	0.21		0.73	0.71		0.18	1.25	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 81.9

Intersection LOS: F

Intersection Capacity Utilization 101.5%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2024 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	33	95	9	40	35	78	706	13	49	951	319
Future Volume (veh/h)	218	33	95	9	40	35	78	706	13	49	951	319
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	229	35	76	9	42	23	82	743	13	52	1001	325
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	357	116	252	282	221	121	120	1136	20	304	868	282
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1409	580	1259	1094	1105	605	423	1817	32	738	1389	451
Grp Volume(v), veh/h	229	0	111	9	0	65	82	0	756	52	0	1326
Grp Sat Flow(s),veh/h/ln	1409	0	1839	1094	0	1711	423	0	1849	738	0	1839
Q Serve(g_s), s	9.7	0.0	3.1	0.4	0.0	1.9	0.0	0.0	22.5	3.4	0.0	37.5
Cycle Q Clear(g_c), s	11.6	0.0	3.1	3.5	0.0	1.9	37.5	0.0	22.5	25.9	0.0	37.5
Prop In Lane	1.00		0.68	1.00		0.35	1.00		0.02	1.00		0.25
Lane Grp Cap(c), veh/h	357	0	368	282	0	342	120	0	1156	304	0	1150
V/C Ratio(X)	0.64	0.00	0.30	0.03	0.00	0.19	0.68	0.00	0.65	0.17	0.00	1.15
Avail Cap(c_a), veh/h	357	0	368	282	0	342	120	0	1156	304	0	1150
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.69	0.00	0.69	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	20.7	22.0	0.0	20.1	42.6	0.0	17.9	18.2	0.0	11.4
Incr Delay (d2), s/veh	3.9	0.0	0.5	0.0	0.0	0.3	19.6	0.0	2.0	1.2	0.0	79.3
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(95%),veh/ln	6.0	0.0	2.3	0.2	0.0	1.3	3.5	0.0	15.8	1.1	0.0	49.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	0.0	21.2	22.0	0.0	20.4	62.2	0.0	19.9	19.4	0.0	90.6
LnGrp LOS	C	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	340			74			838			1378		
Approach Delay, s/veh	26.2			20.6			24.0			88.0		
Approach LOS	C			C			C			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	24.5			13.6			39.5			5.5		
Green Ext Time (p_c), s	9.6			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	57.7											
HCM 6th LOS	E											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	17	61	0	38	16	745	5	10	1010	34
Future Volume (vph)	15	0	17	61	0	38	16	745	5	10	1010	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1672	0	0	1639	0	0	1722	1648
Flt Permitted		0.772			0.803			0.973			0.992	
Satd. Flow (perm)	0	1343	1581	0	1384	0	0	1597	0	0	1710	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	18	0	104	0	0	806	0	0	1074	36
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.6	8.6		8.6			45.1			45.1	45.1
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.08	0.07		0.42			0.67			0.84	0.03
Control Delay		22.2	1.4		18.2			8.7			6.7	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		22.2	1.4		18.2			8.7			6.7	0.0
LOS		C	A		B			A			A	A
Approach Delay		11.2			18.2			8.7			6.5	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		16			152			23	0
Queue Length 95th (ft)		19	3		53			266			m30	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		235	322		287			1200			1285	1249
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		0.07	0.06		0.36			0.67			0.84	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 8.0

Intersection LOS: A

Intersection Capacity Utilization 81.9%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	17	61	0	38	16	745	5	10	1010	34
Future Volume (veh/h)	15	0	17	61	0	38	16	745	5	10	1010	34
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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	10	64	0	25	17	784	5	11	1063	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	287	0	163	200	3	39	71	1219	8	64	1354	1221
Arrive On Green	0.09	0.00	0.10	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1628	0	1586	941	26	378	13	1650	10	5	1832	1652
Grp Volume(v), veh/h	16	0	10	89	0	0	806	0	0	1074	0	35
Grp Sat Flow(s),veh/h/ln	1628	0	1586	1346	0	0	1672	0	0	1837	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.3	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.72		0.28	0.02		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	260	0	163	219	0	0	1269	0	0	1388	0	1221
V/C Ratio(X)	0.06	0.00	0.06	0.41	0.00	0.00	0.63	0.00	0.00	0.77	0.00	0.03
Avail Cap(c_a), veh/h	356	0	278	324	0	0	1269	0	0	1388	0	1221
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	24.8	0.0	24.3	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.2	0.0	0.0	2.4	0.0	0.0	0.4	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(95%),veh/ln	0.4	0.0	0.2	2.3	0.0	0.0	1.5	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	24.5	27.8	0.0	0.0	2.4	0.0	0.0	0.4	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	26			89			806			1109		
Approach Delay, s/veh	24.8			27.8			2.4			0.4		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.3			10.7			49.3			10.7		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.5			2.0			6.0		
Green Ext Time (p_c), s	25.9			0.0			33.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	2.7											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	339	59	134	449	133	93	289	60	217	293	213
Future Volume (vph)	231	339	59	134	449	133	93	289	60	217	293	213
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1781	0	1604	1640	1442
Flt Permitted	0.145			0.552			0.471			0.224		
Satd. Flow (perm)	242	1791	1435	879	1697	1577	755	1781	0	378	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159			8			220
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	238	349	61	138	463	137	96	360	0	224	302	220
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	57.5	57.5	57.5	35.6	35.6	35.6	39.8	31.1		50.2	36.3	36.3
Actuated g/C Ratio	0.48	0.48	0.48	0.30	0.30	0.30	0.33	0.26		0.42	0.30	0.30
v/c Ratio	0.80	0.41	0.08	0.53	0.92	0.24	0.31	0.77		0.75	0.61	0.37
Control Delay	42.3	21.1	0.9	42.4	65.1	3.9	26.6	54.2		32.4	35.0	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	42.3	21.1	0.9	42.4	65.1	3.9	26.6	54.2		32.4	35.0	7.2
LOS	D	C	A	D	E	A	C	D		C	C	A
Approach Delay		27.0			49.5			48.4			26.0	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	104	161	0	87	337	0	47	263		101	179	27
Queue Length 95th (ft)	#212	225	7	152	#502	32	88	#452		m138	m249	m43
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	312	932	795	289	558	625	309	467		301	496	589
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.76	0.37	0.08	0.48	0.83	0.22	0.31	0.77		0.74	0.61	0.37

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 36.9

Intersection LOS: D

Intersection Capacity Utilization 90.2%

ICU Level of Service E

Analysis Period (min) 15

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

			
Ø1	Ø2	Ø3	Ø4 (R)
23 s	45 s	20 s	32 s
			
Ø6	Ø7	Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	231	339	59	134	449	133	93	289	60	217	293	213
Future Volume (veh/h)	231	339	59	134	449	133	93	289	60	217	293	213
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	238	349	31	138	463	0	96	298	61	224	302	149
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	300	825	705	323	502		367	495	101	379	561	476
Arrive On Green	0.12	0.45	0.45	0.28	0.28	0.00	0.06	0.28	0.28	0.12	0.34	0.34
Sat Flow, veh/h	1736	1823	1557	925	1766	1544	1880	1737	355	1616	1655	1402
Grp Volume(v), veh/h	238	349	31	138	463	0	96	0	359	224	302	149
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	925	1766	1544	1880	0	2092	1616	1655	1402
Q Serve(g_s), s	10.9	15.6	1.3	15.1	30.5	0.0	4.2	0.0	17.8	11.2	17.7	9.4
Cycle Q Clear(g_c), s	10.9	15.6	1.3	15.1	30.5	0.0	4.2	0.0	17.8	11.2	17.7	9.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	300	825	705	323	502		367	0	596	379	561	476
V/C Ratio(X)	0.79	0.42	0.04	0.43	0.92		0.26	0.00	0.60	0.59	0.54	0.31
Avail Cap(c_a), veh/h	340	950	811	364	581		391	0	596	379	561	476
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	22.2	18.3	36.1	41.6	0.0	27.5	0.0	37.1	25.4	32.0	29.3
Incr Delay (d2), s/veh	10.9	0.1	0.0	0.3	17.6	0.0	0.4	0.0	4.5	2.4	3.7	1.7
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(95%),veh/ln	8.9	10.5	0.8	6.0	21.6	0.0	3.5	0.0	15.1	7.8	11.9	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	22.4	18.4	36.5	59.3	0.0	27.9	0.0	41.6	27.8	35.7	31.0
LnGrp LOS	D	C	B	D	E		C	A	D	C	D	C
Approach Vol, veh/h	618			601			455			675		
Approach Delay, s/veh	28.6			54.0			38.7			32.1		
Approach LOS	C			D			D			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.2	39.6	20.0	40.2		59.8	13.5	46.7				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	13.4	33.0	13.7	19.8		18.1	6.7	20.2				
Green Ext Time (p_c), s	0.3	0.1	0.0	0.8		0.1	0.0	1.7				

Intersection Summary

HCM 6th Ctrl Delay 38.1
HCM 6th LOS D

Notes

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

Lanes, Volumes, Timings

2024 Build

20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

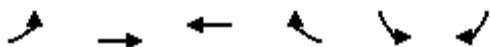
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	256	0	547	71	282	729	0
Future Volume (vph)	0	0	0	0	0	256	0	547	71	282	729	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1844	1567	1787	1881	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1844	1567	1787	1881	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	278	0	595	77	307	792	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	73.8%					ICU Level of Service D						
Analysis Period (min)	15											

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2024 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↖	↗	↖	↗	
Traffic Vol, veh/h	0	0	0	0	0	256	0	547	71	282	729	0
Future Vol, veh/h	0	0	0	0	0	256	0	547	71	282	729	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	278	0	595	77	307	792	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	792	-	-	595	792	0	0	672	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	389	0	0	531	829	-	-	757	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	389	-	-	531	829	-	-	757	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		19		0		3.6					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	829	-	-	-	531	757	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.524	0.405	-	-				
HCM Control Delay (s)	0	-	-	0	19	13	-	-				
HCM Lane LOS	A	-	-	A	C	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	3	2	-	-				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	169	447	448	77	150	326
Future Volume (vph)	169	447	448	77	150	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			225	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	1881	1845	1583	1664	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1770	1881	1845	1583	1664	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	3%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	497	498	86	529	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

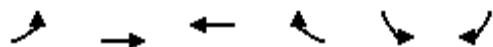
Intersection Capacity Utilization 71.3% ICU Level of Service C

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	41.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	169	447	448	77	150	326
Future Vol, veh/h	169	447	448	77	150	326
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	350	-	-	225	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	1	3	2	2	2
Mvmt Flow	188	497	498	86	167	362
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	584	0	-	0	1371	498
Stage 1	-	-	-	-	498	-
Stage 2	-	-	-	-	873	-
Critical Hdwy	4.5	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	730	-	-	-	175	604
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	454	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	730	-	-	- ~	130	604
Mov Cap-2 Maneuver	-	-	-	-	279	-
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	454	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.2	0		137		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	730	-	-	-	442	
HCM Lane V/C Ratio	0.257	-	-	-	1.197	
HCM Control Delay (s)	11.6	-	-	-	137	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	1	-	-	-	20.5	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2024 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	552	481	56	37	1
Future Volume (vph)	6	552	481	56	37	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1767	0	1670	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1754	1828	1767	0	1670	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	575	559	0	40	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 39.1% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	552	481	56	37	1
Future Vol, veh/h	6	552	481	56	37	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	575	501	58	39	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	559	0	-	0	1117	530
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	587	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	794	-	-	-	224	564
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	589	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	794	-	-	-	222	564
Mov Cap-2 Maneuver	-	-	-	-	378	-
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	589	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		15.5		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	794	-	-	-	381	
HCM Lane V/C Ratio	0.008	-	-	-	0.104	
HCM Control Delay (s)	9.6	-	-	-	15.5	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2024 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	81	76	4	51	65	32	294	6	95	349	54
Future Volume (vph)	84	81	76	4	51	65	32	294	6	95	349	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1389	0	0	1568	0	0	1671	0	0	1570	0
Flt Permitted		0.983			0.998			0.995			0.991	
Satd. Flow (perm)	0	1389	0	0	1568	0	0	1671	0	0	1570	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	251	0	0	125	0	0	345	0	0	519	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	72.9%											
Analysis Period (min)	15											
ICU Level of Service C												

Intersection	
Intersection Delay, s/veh	35.2
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	84	81	76	4	51	65	32	294	6	95	349	54
Future Vol, veh/h	84	81	76	4	51	65	32	294	6	95	349	54
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	88	84	79	4	53	68	33	306	6	99	364	56
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	20	13.1	22.3	56.5
HCM LOS	C	B	C	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	35%	3%	19%
Vol Thru, %	89%	34%	43%	70%
Vol Right, %	2%	32%	54%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	332	241	120	498
LT Vol	32	84	4	95
Through Vol	294	81	51	349
RT Vol	6	76	65	54
Lane Flow Rate	346	251	125	519
Geometry Grp	1	1	1	1
Degree of Util (X)	0.657	0.545	0.26	0.964
Departure Headway (Hd)	6.843	7.817	7.48	6.692
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	522	459	484	540
Service Time	4.94	5.916	5.48	4.776
HCM Lane V/C Ratio	0.663	0.547	0.258	0.961
HCM Control Delay	22.3	20	13.1	56.5
HCM Lane LOS	C	C	B	F
HCM 95th-tile Q	4.7	3.2	1	12.7

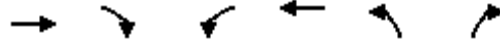
Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (vph)	672	82	147	580	88	142
Future Volume (vph)	672	82	147	580	88	142
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1837	0	1761	1958	1571	0
Flt Permitted			0.178		0.981	
Satd. Flow (perm)	1837	0	330	1958	1571	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	7					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	762	0	148	586	232	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	61.4		75.4	74.2	25.4	
Actuated g/C Ratio	0.56		0.69	0.67	0.23	
v/c Ratio	0.74		0.44	0.44	0.64	
Control Delay	25.2		9.5	10.4	45.7	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	25.2		9.5	10.4	45.7	
LOS	C		A	B	D	
Approach Delay	25.2			10.2	45.7	
Approach LOS	C			B	D	
Queue Length 50th (ft)	383		36	198	149	
Queue Length 95th (ft)	#691		m60	m313	213	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2024 Build
SAT Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1028		343	1320	568	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.74		0.43	0.44	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 21.6

Intersection LOS: C

Intersection Capacity Utilization 77.5%

ICU Level of Service D

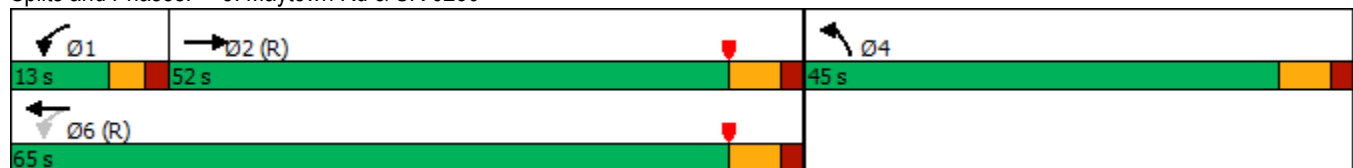
Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2024 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	672	82	147	580	88	142
Future Volume (veh/h)	672	82	147	580	88	142
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	679	81	148	586	89	143
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	978	117	432	1510	116	186
Arrive On Green	0.63	0.62	0.04	0.48	0.18	0.17
Sat Flow, veh/h	1547	185	1927	2090	634	1018
Grp Volume(v), veh/h	0	760	148	586	233	0
Grp Sat Flow(s),veh/h/ln	0	1731	1927	2090	1659	0
Q Serve(g_s), s	0.0	31.7	2.7	19.6	14.7	0.0
Cycle Q Clear(g_c), s	0.0	31.7	2.7	19.6	14.7	0.0
Prop In Lane		0.11	1.00		0.38	0.61
Lane Grp Cap(c), veh/h	0	1094	432	1510	303	0
V/C Ratio(X)	0.00	0.69	0.34	0.39	0.77	0.00
Avail Cap(c_a), veh/h	0	1094	486	1510	600	0
HCM Platoon Ratio	1.00	1.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.3	11.9	12.9	43.0	0.0
Incr Delay (d2), s/veh	0.0	3.6	0.5	0.8	13.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	17.9	2.2	15.4	11.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	16.9	12.3	13.7	56.7	0.0
LnGrp LOS	A	B	B	B	E	A
Approach Vol, veh/h	760			734	233	
Approach Delay, s/veh	16.9			13.4	56.7	
Approach LOS	B			B	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.9	74.7		25.3		84.7
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	4.7	33.7		16.7		21.6
Green Ext Time (p_c), s	0.1	9.2		2.4		16.3
Intersection Summary						
HCM 6th Ctrl Delay			20.8			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	873	0	1	890	109	0	0	1	57	0	35
Future Volume (vph)	16	873	0	1	890	109	0	0	1	57	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	909	0	1	1041	0	0	1	0	59	36	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 69.9% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	873	0	1	890	109	0	0	1	57	0	35
Future Vol, veh/h	16	873	0	1	890	109	0	0	1	57	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	17	909	0	1	927	114	0	0	1	59	0	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1041	0	0	909	0	0	1947	1986	909	1930	1929	984
Stage 1	-	-	-	-	-	-	943	943	-	986	986	-
Stage 2	-	-	-	-	-	-	1004	1043	-	944	943	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	616	-	-	427	-	-	65	77	368	74	93	343
Stage 1	-	-	-	-	-	-	389	382	-	390	387	-
Stage 2	-	-	-	-	-	-	361	347	-	410	402	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	616	-	-	427	-	-	57	75	368	72	90	343
Mov Cap-2 Maneuver	-	-	-	-	-	-	57	75	-	72	90	-
Stage 1	-	-	-	-	-	-	378	371	-	379	386	-
Stage 2	-	-	-	-	-	-	322	346	-	398	391	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	14.8	103.9
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	368	616	-	-	427	-	-	72	343
HCM Lane V/C Ratio	0.003	0.027	-	-	0.002	-	-	0.825	0.106
HCM Control Delay (s)	14.8	11	-	-	13.5	-	-	157.4	16.7
HCM Lane LOS	B	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	4	0.4

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	649	49	152	739	15	254	3	159	34	4	14
Future Volume (vph)	21	649	49	152	739	15	254	3	159	34	4	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1744	0
Flt Permitted	0.332			0.216			0.745			0.547		
Satd. Flow (perm)	577	1783	1584	357	1697	1573	1329	1574	0	1014	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			167			15
Link Speed (mph)		40			40			25				25
Link Distance (ft)		1060			1340			300				300
Travel Time (s)		18.1			22.8			8.2				8.2
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	683	52	160	778	16	267	170	0	36	19	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	59.2	59.2	59.2	75.6	74.3	74.3	25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.69	0.68	0.68	0.23	0.23		0.23	0.23	
v/c Ratio	0.07	0.71	0.06	0.44	0.68	0.01	0.89	0.35		0.16	0.05	
Control Delay	15.4	20.3	2.7	10.6	10.7	1.5	71.3	7.7		35.4	17.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	15.4	20.3	2.7	10.6	10.7	1.5	71.3	7.7		35.4	17.4	
LOS	B	C	A	B	B	A	E	A		D	B	
Approach Delay		18.9			10.5			46.6			29.2	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	6	196	0	27	168	0	181	2		20	2	
Queue Length 95th (ft)	m14	345	m5	72	273	m1	#326	56		49	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	310	959	890	439	1146	1072	315	500		240	425	
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	0.07	0.71	0.06	0.36	0.68	0.01	0.85	0.34		0.15	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 21.0

Intersection LOS: C

Intersection Capacity Utilization 89.6%

ICU Level of Service E

Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2024 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	649	49	152	739	15	254	3	159	34	4	14
Future Volume (veh/h)	21	649	49	152	739	15	254	3	159	34	4	14
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	22	683	30	160	778	11	267	3	102	36	4	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	506	1192	1015	583	1203	1067	377	10	344	290	131	263
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.21	0.21	0.20	0.21	0.21	0.20
Sat Flow, veh/h	756	2047	1743	1666	1736	1540	1489	48	1642	1395	626	1253
Grp Volume(v), veh/h	22	683	30	160	778	11	267	0	105	36	0	12
Grp Sat Flow(s),veh/h/ln	756	2047	1743	1666	1736	1540	1489	0	1691	1395	0	1879
Q Serve(g_s), s	0.0	0.0	0.0	3.9	0.0	0.0	19.0	0.0	5.8	2.4	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.9	0.0	0.0	19.1	0.0	5.8	7.8	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.67
Lane Grp Cap(c), veh/h	506	1192	1015	583	1203	1067	377	0	354	290	0	394
V/C Ratio(X)	0.04	0.57	0.03	0.27	0.65	0.01	0.71	0.00	0.30	0.12	0.00	0.03
Avail Cap(c_a), veh/h	506	1192	1015	732	1203	1067	418	0	401	329	0	446
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)	1.00	1.00	1.00	0.74	0.74	0.74	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.0	0.0	0.0	41.9	0.0	37.1	39.7	0.0	34.9
Incr Delay (d2), s/veh	0.2	2.0	0.1	0.2	2.0	0.0	4.9	0.0	0.5	0.2	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(95%),veh/ln	0.0	1.2	0.0	2.0	1.2	0.0	12.0	0.0	4.5	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	2.0	0.1	6.2	2.0	0.0	46.8	0.0	37.5	39.9	0.0	34.9
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	735			949			372			48		
Approach Delay, s/veh	1.9			2.7			44.2			38.6		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	12.2	69.9	28.0			82.0	28.0					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25			72.2	* 25					
Max Q Clear Time (g_c+I1), s	6.4	2.5	10.3			2.5	21.6					
Green Ext Time (p_c), s	0.3	0.8	0.1			1.0	0.5					

Intersection Summary

HCM 6th Ctrl Delay 10.6
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	596	12	4	722	66	9	3	10	61	38	127
Future Volume (vph)	106	596	12	4	722	66	9	3	10	61	38	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%				-1%
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1742	0	1744	1818	1561	0	1765	0	1719	1573	0
Flt Permitted	0.254			0.416				0.601		0.742		
Satd. Flow (perm)	448	1742	0	764	1818	1561	0	1082	0	1342	1573	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				80		11			137	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	654	0	4	776	71	0	24	0	66	178	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	89.0	88.1		75.5	75.5	75.5		11.9		11.9	11.9	
Actuated g/C Ratio	0.81	0.80		0.69	0.69	0.69		0.11		0.11	0.11	
v/c Ratio	0.25	0.47		0.01	0.62	0.06		0.19		0.46	0.61	
Control Delay	4.6	5.9		6.0	13.5	1.3		32.1		55.0	22.1	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.6	5.9		6.0	13.7	1.3		32.1		55.0	22.1	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		5.7			12.6			32.1			31.0	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	18	135		1	325	2		8		44	27	
Queue Length 95th (ft)	m32	234		m2	531	6		33		86	94	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	468	1395		524	1247	1095		238		285	442	
Starvation Cap Reductn	0	0		0	69	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	0.24	0.47		0.01	0.66	0.06		0.10		0.23	0.40	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 12.4

Intersection LOS: B

Intersection Capacity Utilization 69.7%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
14 s	68 s	28 s
 Ø5 (R)		 Ø8
82 s		28 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2024 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	596	12	4	722	66	9	3	10	61	38	127
Future Volume (veh/h)	106	596	12	4	722	66	9	3	10	61	38	127
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	114	641	11	4	776	58	10	3	7	66	41	66
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	580	1355	23	656	1406	1200	67	27	24	189	59	96
Arrive On Green	0.09	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1629	1663	29	813	1935	1652	187	291	257	1375	631	1016
Grp Volume(v), veh/h	114	0	652	4	776	58	20	0	0	66	0	107
Grp Sat Flow(s),veh/h/ln	1629	0	1692	813	1935	1652	735	0	0	1375	0	1647
Q Serve(g_s), s	1.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	6.9
Cycle Q Clear(g_c), s	1.7	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	5.4	0.0	6.9
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.35	1.00		0.62
Lane Grp Cap(c), veh/h	580	0	1378	656	1406	1200	112	0	0	189	0	155
V/C Ratio(X)	0.20	0.00	0.47	0.01	0.55	0.05	0.18	0.00	0.00	0.35	0.00	0.69
Avail Cap(c_a), veh/h	644	0	1378	656	1406	1200	283	0	0	352	0	350
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(l)	0.67	0.00	0.67	0.86	0.86	0.86	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.4	0.0	0.0	0.0	0.0	0.0	46.2	0.0	0.0	47.6	0.0	48.6
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.0	1.3	0.1	0.8	0.0	0.0	1.1	0.0	5.4
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(95%),veh/ln	0.6	0.0	0.5	0.0	0.9	0.0	1.0	0.0	0.0	3.2	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.5	0.0	0.8	0.0	1.3	0.1	46.9	0.0	0.0	48.7	0.0	53.9
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	766			838			20			173		
Approach Delay, s/veh	1.0			1.3			46.9			51.9		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.7	85.3	15.0		95.0		15.0					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.2	2.5	8.9		2.5		9.0					
Green Ext Time (p_c), s	0.1	1.1	0.5		0.8		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	6.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	574	23	20	605	13	66	23	17	15	20	74
Future Volume (vph)	54	574	23	20	605	13	66	23	17	15	20	74
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1746	0	1620	1700	0	1541	1660	0	0	1821	0
Flt Permitted	0.378			0.390			0.538				0.952	
Satd. Flow (perm)	657	1746	0	665	1700	0	873	1660	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			18			78	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	628	0	21	651	0	69	42	0	0	115	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.8	86.8		86.8	86.8		13.3	13.3			13.3	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.11	0.46		0.04	0.49		0.66	0.19			0.41	
Control Delay	5.4	7.0		3.6	6.0		73.0	29.1			20.7	
Queue Delay	0.0	0.1		0.0	0.1		0.0	0.0			0.0	
Total Delay	5.4	7.1		3.6	6.0		73.0	29.1			20.7	
LOS	A	A		A	A		E	C			C	
Approach Delay		7.0			5.9			56.4			20.7	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	11	168		3	126		47	15			24	
Queue Length 95th (ft)	28	221		10	246		91	46			73	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	518	1377		524	1341		325	630			699	
Starvation Cap Reductn	0	120		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	55		0	0			2	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.11	0.50		0.04	0.51		0.21	0.07			0.16	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.0

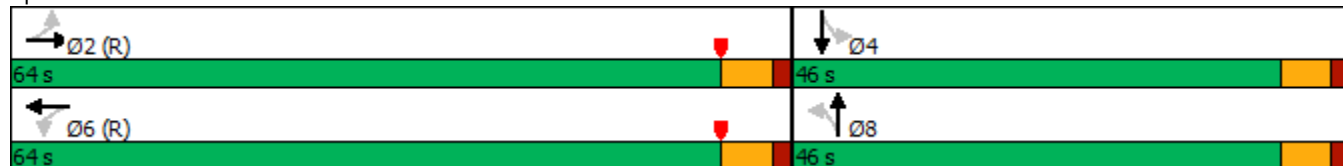
Intersection LOS: B

Intersection Capacity Utilization 69.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

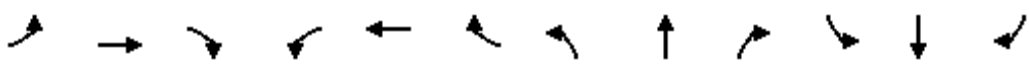
2024 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	574	23	20	605	13	66	23	17	15	20	74
Future Volume (veh/h)	54	574	23	20	605	13	66	23	17	15	20	74
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	57	604	19	21	637	13	69	24	6	16	21	31
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	606	1399	44	750	1560	32	170	100	25	62	50	60
Arrive On Green	1.00	1.00	1.00	0.84	0.84	0.83	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	720	1674	53	819	1867	38	1245	1351	338	287	681	811
Grp Volume(v), veh/h	57	0	623	21	0	650	69	0	30	68	0	0
Grp Sat Flow(s),veh/h/ln	720	0	1726	819	0	1905	1245	0	1689	1779	0	0
Q Serve(g_s), s	1.0	0.0	0.0	0.5	0.0	9.4	0.9	0.0	1.8	1.9	0.0	0.0
Cycle Q Clear(g_c), s	10.3	0.0	0.0	0.5	0.0	9.4	4.9	0.0	1.8	4.0	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.20	0.24		0.46
Lane Grp Cap(c), veh/h	606	0	1443	750	0	1592	170	0	125	156	0	0
V/C Ratio(X)	0.09	0.00	0.43	0.03	0.00	0.41	0.41	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	606	0	1443	750	0	1592	541	0	630	675	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)	0.88	0.00	0.88	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.5	0.0	0.0	1.5	0.0	2.3	49.3	0.0	48.1	49.3	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.8	0.1	0.0	0.8	1.6	0.0	1.0	1.9	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(95%),veh/ln	0.1	0.0	0.6	0.1	0.0	3.6	3.4	0.0	1.4	3.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	0.0	0.8	1.6	0.0	3.0	50.9	0.0	49.1	51.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	680			671			99			68		
Approach Delay, s/veh	0.8			3.0			50.3			51.2		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.8			13.2			96.8			13.2		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.0			11.4			6.9		
Green Ext Time (p_c), s	24.3			0.2			24.2			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	7.3											
HCM 6th LOS	A											
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (vph)	0	0	0	426	1	59	265	138	3	0	154	27
Future Volume (vph)	0	0	0	426	1	59	265	138	3	0	154	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1640	1442	1574	1637	0	0	1740	1578
Flt Permitted					0.952		0.490					
Satd. Flow (perm)	0	0	0	0	1640	1442	812	1637	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164		2				155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	445	61	276	147	0	0	160	28
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					18.8	18.8	27.9	27.9			14.8	14.8
Actuated g/C Ratio					0.33	0.33	0.50	0.50			0.26	0.26
v/c Ratio					0.81	0.10	0.54	0.18			0.35	0.05
Control Delay					31.7	0.4	13.7	8.9			19.8	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					31.7	0.4	13.7	8.9			19.8	0.2
LOS					C	A	B	A			B	A
Approach Delay					28.0			12.0			16.9	
Approach LOS					C			B			B	
Queue Length 50th (ft)					130	0	56	27			45	0
Queue Length 95th (ft)					#282	0	102	54			89	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					601	633	511	879			529	587
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					0.74	0.10	0.54	0.17			0.30	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 56.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 20.1

Intersection LOS: C

Intersection Capacity Utilization 62.5%

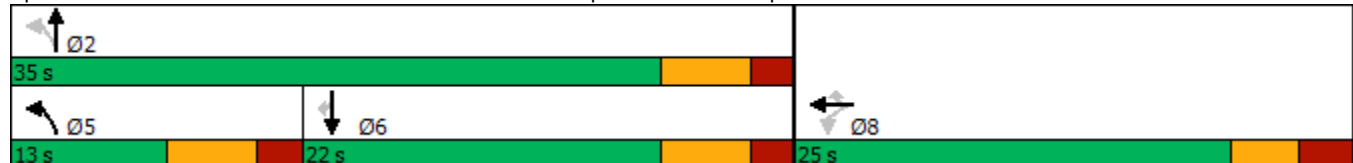
ICU Level of Service B

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2024 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	426	1	59	265	138	3	0	154	27
Future Volume (veh/h)	0	0	0	426	1	59	265	138	3	0	154	27
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	1750	0	1860	1787
Adj Flow Rate, veh/h				444	1	0	276	144	3	0	160	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	2	0	1	11
Cap, veh/h				554	1		600	841	18	0	469	
Arrive On Green				0.29	0.31	0.00	0.16	0.50	0.49	0.00	0.25	0.00
Sat Flow, veh/h				1781	4	1589	1640	1667	35	0	1860	1514
Grp Volume(v), veh/h				445	0	0	276	0	147	0	160	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	0	1701	0	1860	1514
Q Serve(g_s), s				11.9	0.0	0.0	5.8	0.0	2.4	0.0	3.6	0.0
Cycle Q Clear(g_c), s				11.9	0.0	0.0	5.8	0.0	2.4	0.0	3.6	0.0
Prop In Lane				1.00		1.00	1.00		0.02	0.00		1.00
Lane Grp Cap(c), veh/h				555	0		600	0	858	0	469	
V/C Ratio(X)				0.80	0.00		0.46	0.00	0.17	0.00	0.34	
Avail Cap(c_a), veh/h				710	0		600	0	991	0	614	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.8	0.0	0.0	9.9	0.0	6.9	0.0	15.8	0.0
Incr Delay (d2), s/veh				5.1	0.0	0.0	0.6	0.0	0.3	0.0	1.6	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
%ile BackOfQ(95%),veh/ln				9.0	0.0	0.0	2.9	0.0	1.2	0.0	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				21.9	0.0	0.0	10.5	0.0	7.3	0.0	17.3	0.0
LnGrp LOS				C	A		B	A	A	A	B	
Approach Vol, veh/h					445			423			160	
Approach Delay, s/veh					21.9			9.3			17.3	
Approach LOS					C			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		20.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		4.4			7.8	5.6		13.9				
Green Ext Time (p_c), s		2.9			0.0	1.8		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				16.0								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	269	0	0	0	0	372	431	86	496	0
Future Volume (vph)	23	0	269	0	0	0	0	372	431	86	496	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1673	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1673	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	289	0	0	0	0	863	0	92	533	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	64.1%						ICU Level of Service C					
Analysis Period (min)	15											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2024 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	23	0	269	0	0	0	0	372	431	86	496	0
Future Vol, veh/h	23	0	269	0	0	0	0	372	431	86	496	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	25	0	289	0	0	0	0	400	463	92	533	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1117	1117	533	-	0	0	400	0	0
Stage 1	717	717	-	-	-	-	-	-	-
Stage 2	400	400	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	233	252	603	0	-	-	915	-	0
Stage 1	583	492	-	0	-	-	-	-	0
Stage 2	794	647	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	209	0	603	-	-	-	915	-	-
Mov Cap-2 Maneuver	209	0	-	-	-	-	-	-	-
Stage 1	583	0	-	-	-	-	-	-	-
Stage 2	714	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0	1.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	209	603	915	-
HCM Lane V/C Ratio	-	-	0.118	0.48	0.101	-
HCM Control Delay (s)	-	-	24.5	16.4	9.4	-
HCM Lane LOS	-	-	C	C	A	-
HCM 95th %tile Q(veh)	-	-	0.4	2.6	0.3	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	13	777	780	3
Future Volume (vph)	6	11	13	777	780	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1798	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1798	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	841	833	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	61.3%			ICU Level of Service B		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2024 Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	13	777	780	3
Future Vol, veh/h	6	11	13	777	780	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	14	827	830	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1687	832	833	0	-	0
Stage 1	832	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	100	388	675	-	-	-
Stage 1	439	-	-	-	-	-
Stage 2	428	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	96	388	675	-	-	-
Mov Cap-2 Maneuver	96	-	-	-	-	-
Stage 1	422	-	-	-	-	-
Stage 2	428	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	26.3	0.2		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	675	-	187	-	-	
HCM Lane V/C Ratio	0.02	-	0.097	-	-	
HCM Control Delay (s)	10.4	0	26.3	-	-	
HCM Lane LOS	B	A	D	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	23	75	11	21	32	50	619	8	19	603	179
Future Volume (vph)	151	23	75	11	21	32	50	619	8	19	603	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1662	0	1572	1636	0	1620	1712	0	1550	1701	0
Flt Permitted	0.720			0.690			0.236			0.337		
Satd. Flow (perm)	1228	1662	0	1142	1636	0	402	1712	0	550	1701	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		79			34			2			42	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	103	0	12	56	0	53	660	0	20	823	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.7	12.7		12.4	12.4		40.5	40.5		40.5	40.5	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.68	0.68		0.68	0.68	
v/c Ratio	0.61	0.25		0.05	0.15		0.20	0.57		0.05	0.71	
Control Delay	31.5	8.9		17.9	11.0		7.0	9.8		6.1	13.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.5	8.9		17.9	11.0		7.0	9.8		6.1	13.7	
LOS	C	A		B	B		A	A		A	B	
Approach Delay		22.6			12.3			9.6			13.5	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)	51	7		3	6		8	137		3	190	
Queue Length 95th (ft)	102	38		14	29		m18	324		11	#440	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings

11: Cloverleaf Rd & Schwanger Rd

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	307	474		285	434		271	1156		371	1161	
Starvation Cap Reductn	0	0		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	0.52	0.22		0.04	0.13		0.20	0.57		0.05	0.71	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 13.3

Intersection LOS: B

Intersection Capacity Utilization 69.2%

ICU Level of Service C

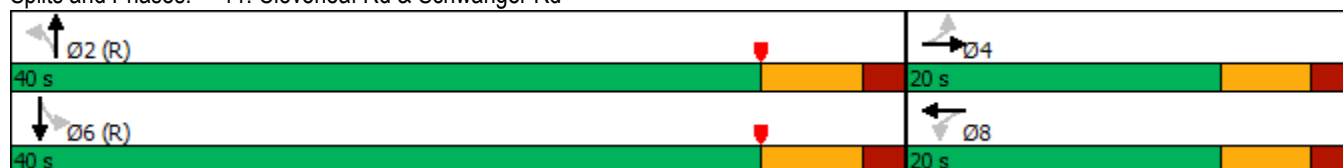
Analysis Period (min) 15

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2024 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	23	75	11	21	32	50	619	8	19	603	179
Future Volume (veh/h)	151	23	75	11	21	32	50	619	8	19	603	179
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	159	24	52	12	22	20	53	652	7	20	635	154
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	348	104	226	298	158	143	390	1191	13	377	971	235
Arrive On Green	0.18	0.18	0.16	0.18	0.18	0.16	0.21	0.21	0.21	0.65	0.65	0.63
Sat Flow, veh/h	1439	581	1258	1238	878	798	702	1846	20	778	1504	365
Grp Volume(v), veh/h	159	0	76	12	0	42	53	0	659	20	0	789
Grp Sat Flow(s),veh/h/ln	1439	0	1839	1238	0	1676	702	0	1866	778	0	1869
Q Serve(g_s), s	6.3	0.0	2.1	0.5	0.0	1.3	4.1	0.0	18.9	1.1	0.0	15.6
Cycle Q Clear(g_c), s	7.5	0.0	2.1	2.6	0.0	1.3	19.7	0.0	18.9	19.9	0.0	15.6
Prop In Lane	1.00		0.68	1.00		0.48	1.00		0.01	1.00		0.20
Lane Grp Cap(c), veh/h	348	0	330	298	0	301	390	0	1204	377	0	1207
V/C Ratio(X)	0.46	0.00	0.23	0.04	0.00	0.14	0.14	0.00	0.55	0.05	0.00	0.65
Avail Cap(c_a), veh/h	449	0	460	385	0	419	390	0	1204	377	0	1207
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.86	0.00	0.86	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	21.4	22.2	0.0	20.9	23.1	0.0	15.8	13.8	0.0	6.6
Incr Delay (d2), s/veh	0.9	0.0	0.4	0.1	0.0	0.2	0.6	0.0	1.5	0.3	0.0	2.8
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(95%),veh/ln	3.7	0.0	1.6	0.3	0.0	0.9	1.4	0.0	14.2	0.3	0.0	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	21.7	22.3	0.0	21.1	23.7	0.0	17.3	14.1	0.0	9.4
LnGrp LOS	C	A	C	C	A	C	C	A	B	B	A	A
Approach Vol, veh/h	235			54			712			809		
Approach Delay, s/veh	23.8			21.4			17.8			9.5		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.2			15.8			44.2			15.8		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	20.9			9.5			17.6			4.6		
Green Ext Time (p_c), s	9.2			0.3			12.9			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	15.0											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	23	0	7	15	669	7	11	694	7
Future Volume (vph)	5	1	12	23	0	7	15	669	7	11	694	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1698	0	0	1671	0	0	1722	1648
Flt Permitted					0.986			0.982			0.989	
Satd. Flow (perm)	0	1740	1581	0	1739	0	0	1642	0	0	1705	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	31	0	0	727	0	0	743	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.12			0.50			0.49	0.00
Control Delay		23.5	0.5		5.0			4.0			2.2	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.5		5.0			4.0			2.2	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.8			5.0			4.0			2.2	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		12			184			14	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		377			1456			1512	1466
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		0.02	0.04		0.08			0.50			0.49	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 3.2

Intersection LOS: A

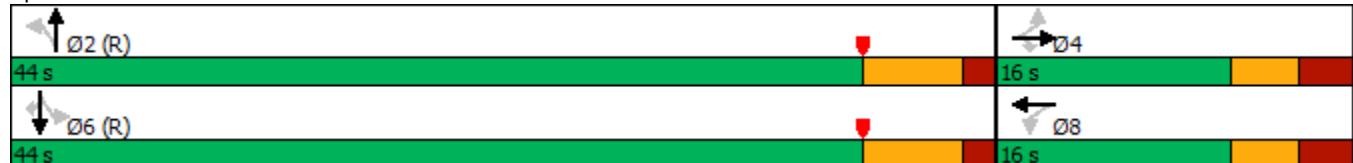
Intersection Capacity Utilization 66.7%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2024 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	23	0	7	15	669	7	11	694	7
Future Volume (veh/h)	5	1	12	23	0	7	15	669	7	11	694	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	24	0	3	16	704	7	12	731	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	171	12	69	161	0	6	72	1343	13	68	1457	1319
Arrive On Green	0.03	0.04	0.04	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1397	279	1586	1109	0	139	13	1682	16	8	1825	1652
Grp Volume(v), veh/h	6	0	6	27	0	0	727	0	0	743	0	7
Grp Sat Flow(s),veh/h/ln	1676	0	1586	1248	0	0	1712	0	0	1833	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	1.3	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.89		0.11	0.02		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	155	0	69	147	0	0	1399	0	0	1494	0	1319
V/C Ratio(X)	0.04	0.00	0.09	0.18	0.00	0.00	0.52	0.00	0.00	0.50	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1399	0	0	1494	0	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.65	0.00	0.65
Uniform Delay (d), s/veh	28.0	0.0	27.6	28.7	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.5	0.6	0.0	0.0	1.4	0.0	0.0	0.8	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(95%),veh/ln	0.2	0.0	0.2	0.7	0.0	0.0	1.7	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	0.0	28.1	29.3	0.0	0.0	3.5	0.0	0.0	0.8	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	12			27			727			750		
Approach Delay, s/veh	28.1			29.3			3.5			0.8		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	52.9			7.1			52.9			7.1		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	10.9			2.2			2.0			3.3		
Green Ext Time (p_c), s	18.4			0.0			23.2			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	2.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	358	55	125	442	135	70	176	67	125	138	133
Future Volume (vph)	218	358	55	125	442	135	70	176	67	125	138	133
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1807	0	1558	1624	1499
Flt Permitted	0.163			0.544			0.667			0.473		
Satd. Flow (perm)	270	1809	1435	874	1731	1592	1219	1807	0	776	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		24				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	222	365	56	128	451	138	71	248	0	128	141	136
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	32.6	32.6	32.6	18.9	18.9	18.9	20.1	14.2		20.3	14.3	14.3
Actuated g/C Ratio	0.47	0.47	0.47	0.27	0.27	0.27	0.29	0.21		0.29	0.21	0.21
v/c Ratio	0.79	0.43	0.07	0.54	0.96	0.22	0.17	0.64		0.40	0.42	0.27
Control Delay	38.4	16.1	0.2	34.7	62.2	0.8	14.8	31.3		18.5	28.9	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	38.4	16.1	0.2	34.7	62.2	0.8	14.8	31.3		18.5	28.9	1.3
LOS	D	B	A	C	E	A	B	C		B	C	A
Approach Delay		22.4			45.5			27.6			16.3	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	62	110	0	50	~211	0	19	92		36	55	0
Queue Length 95th (ft)	#181	190	0	#122	#405	0	43	162		71	105	0
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	281	853	762	238	472	619	417	484		320	419	570
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.79	0.43	0.07	0.54	0.96	0.22	0.17	0.51		0.40	0.34	0.24

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 69.1

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 30.0

Intersection LOS: C

Intersection Capacity Utilization 77.9%

ICU Level of Service D

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary 17: Colebrook Rd/Cloverleaf Rd & SR 0230

2024 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	358	55	125	442	135	70	176	67	125	138	133
Future Volume (veh/h)	218	358	55	125	442	135	70	176	67	125	138	133
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	222	365	50	128	451	0	71	180	65	128	141	54
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	334	866	734	352	489		421	252	91	335	342	302
Arrive On Green	0.12	0.47	0.47	0.27	0.27	0.00	0.06	0.16	0.15	0.11	0.21	0.21
Sat Flow, veh/h	1723	1837	1557	903	1794	1557	2069	1533	553	1576	1641	1450
Grp Volume(v), veh/h	222	365	50	128	451	0	71	0	245	128	141	54
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	903	1794	1557	2069	0	2086	1576	1641	1450
Q Serve(g_s), s	5.8	8.9	1.2	8.2	16.6	0.0	1.9	0.0	7.6	4.4	5.1	2.1
Cycle Q Clear(g_c), s	5.8	8.9	1.2	8.2	16.6	0.0	1.9	0.0	7.6	4.4	5.1	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	334	866	734	352	489		421	0	343	335	342	302
V/C Ratio(X)	0.66	0.42	0.07	0.36	0.92		0.17	0.00	0.72	0.38	0.41	0.18
Avail Cap(c_a), veh/h	334	866	734	352	489		535	0	537	352	423	374
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	11.9	9.8	21.0	24.0	0.0	21.1	0.0	27.0	20.1	23.3	22.1
Incr Delay (d2), s/veh	4.9	0.1	0.0	0.2	22.8	0.0	0.2	0.0	2.8	0.7	0.8	0.3
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(95%),veh/ln	4.1	5.3	0.6	2.8	14.2	0.0	1.6	0.0	7.1	2.7	3.4	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	12.0	9.8	21.2	46.8	0.0	21.2	0.0	29.8	20.8	24.1	22.4
LnGrp LOS	C	B	A	C	D		C	A	C	C	C	C
Approach Vol, veh/h	637			579			316			323		
Approach Delay, s/veh	14.9			41.1			27.9			22.5		
Approach LOS	B			D			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	24.0	13.3	17.2		37.5	10.3	20.2				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	8.3	19.1	6.9	9.6		11.4	4.4	7.6				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.6		0.1	0.0	0.6				

Intersection Summary

HCM 6th Ctrl Delay	26.6
HCM 6th LOS	C

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	268	0	425	71	281	397	0
Future Volume (vph)	0	0	0	0	0	268	0	425	71	281	397	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1844	1567	1787	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1844	1567	1787	1863	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	298	0	472	79	312	441	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 49.9%

ICU Level of Service A

Analysis Period (min) 15

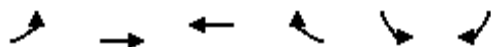
HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2024 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↖	↗	↖	↗	
Traffic Vol, veh/h	0	0	0	0	0	268	0	425	71	281	397	0
Future Vol, veh/h	0	0	0	0	0	268	0	425	71	281	397	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	0	0	0	298	0	472	79	312	441	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	441	-	-	472	441	0	0	551	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	616	0	0	625	1119	-	-	824	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	616	-	-	625	1119	-	-	824	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		15.9		0		5					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1119	-	-	-	625	824	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.476	0.379	-	-				
HCM Control Delay (s)	0	-	-	0	15.9	12	-	-				
HCM Lane LOS	A	-	-	A	C	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	2.6	1.8	-	-				

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2024 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	188	363	465	94	150	300
Future Volume (vph)	188	363	465	94	150	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			225	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	1881	1881	1583	1668	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1770	1881	1881	1583	1668	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	209	403	517	104	500	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 71.7% ICU Level of Service C

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	38.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	188	363	465	94	150	300
Future Vol, veh/h	188	363	465	94	150	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	350	-	-	225	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	1	1	2	2	2
Mvmt Flow	209	403	517	104	167	333
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	621	0	-	0	1338	517
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	821	-
Critical Hdwy	4.5	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	707	-	-	-	183	589
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	481	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	707	-	-	- ~	129	589
Mov Cap-2 Maneuver	-	-	-	-	277	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	481	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.2	0		127.8		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	707	-	-	-	428	
HCM Lane V/C Ratio	0.295	-	-	-	1.168	
HCM Control Delay (s)	12.2	-	-	-	127.8	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	1.2	-	-	-	18.9	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2024 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	49	32	15	32	60	19	218	7	37	220	42
Future Volume (vph)	46	49	32	15	32	60	19	218	7	37	220	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1676	0	0	1621	0	0	1774	0	0	1848	0
Flt Permitted		0.982			0.993			0.996			0.994	
Satd. Flow (perm)	0	1676	0	0	1621	0	0	1774	0	0	1848	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	132	0	0	112	0	0	254	0	0	312	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	44.9%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

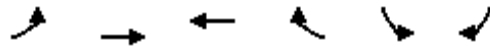
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	46	49	32	15	32	60	19	218	7	37	220	42
Future Vol, veh/h	46	49	32	15	32	60	19	218	7	37	220	42
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	48	51	33	16	33	63	20	227	7	39	229	44
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10	9.3	11	11.5
HCM LOS	A	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	36%	14%	12%
Vol Thru, %	89%	39%	30%	74%
Vol Right, %	3%	25%	56%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	244	127	107	299
LT Vol	19	46	15	37
Through Vol	218	49	32	220
RT Vol	7	32	60	42
Lane Flow Rate	254	132	111	311
Geometry Grp	1	1	1	1
Degree of Util (X)	0.361	0.205	0.163	0.424
Departure Headway (Hd)	5.108	5.57	5.253	4.9
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	707	644	682	738
Service Time	3.117	3.607	3.291	2.908
HCM Lane V/C Ratio	0.359	0.205	0.163	0.421
HCM Control Delay	11	10	9.3	11.5
HCM Lane LOS	B	A	A	B
HCM 95th-tile Q	1.6	0.8	0.6	2.1

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2024 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	474	510	33	31	3
Future Volume (vph)	3	474	510	33	31	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1796	0	1658	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1796	0	1658	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	494	565	0	35	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 38.8% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	474	510	33	31	3
Future Vol, veh/h	3	474	510	33	31	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	494	531	34	32	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	565	0	-	0	1048	548
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	791	-	-	-	249	550
Stage 1	-	-	-	-	618	-
Stage 2	-	-	-	-	656	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	791	-	-	-	248	550
Mov Cap-2 Maneuver	-	-	-	-	403	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	656	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		14.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	791	-	-	-	413	
HCM Lane V/C Ratio	0.004	-	-	-	0.086	
HCM Control Delay (s)	9.6	-	-	-	14.5	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

APPENDIX L4

2024 BUILD WITH IMPROVEMENTS CONDITION ANALYSES

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	22	33	6	43	119	46	336	9	31	189	77
Future Volume (vph)	69	22	33	6	43	119	46	336	9	31	189	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1231	0	0	1456	0	0	1577	0	0	1435	0
Flt Permitted		0.803			0.985			0.932			0.936	
Satd. Flow (perm)	0	1016	0	0	1437	0	0	1479	0	0	1349	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		31			124			3			45	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	0	175	0	0	407	0	0	309	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	23.0	23.0		23.0	23.0		37.0	37.0		37.0	37.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%		61.7%	61.7%		61.7%	61.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		10.9			10.9			22.6			22.6	
Actuated g/C Ratio		0.28			0.28			0.57			0.57	
v/c Ratio		0.43			0.36			0.48			0.39	
Control Delay		15.5			7.7			10.3			8.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.5			7.7			10.3			8.3	
LOS		B			A			B			A	
Approach Delay		15.5			7.7			10.3			8.3	
Approach LOS		B			A			B			A	
Queue Length 50th (ft)		15			7			55			32	
Queue Length 95th (ft)		65			50			155			102	
Internal Link Dist (ft)		1077			1324			919			946	
Turn Bay Length (ft)												
Base Capacity (vph)		507			759			1233			1132	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.25			0.23			0.33			0.27	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 39.5

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 9.9

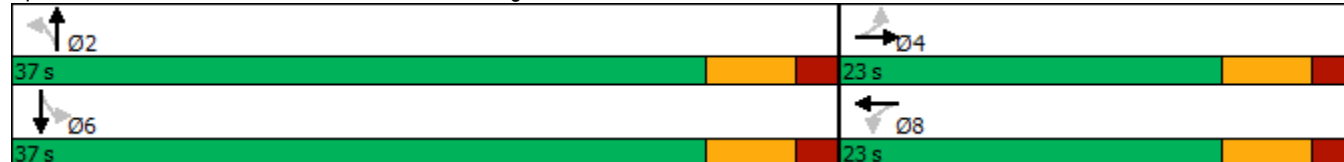
Intersection LOS: A

Intersection Capacity Utilization 60.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave



HCM 6th Signalized Intersection Summary 33: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	22	33	6	43	119	46	336	9	31	189	77
Future Volume (veh/h)	69	22	33	6	43	119	46	336	9	31	189	77
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	72	23	34	6	45	124	48	350	9	32	197	80
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	379	87	89	151	91	236	198	575	14	188	447	168
Arrive On Green	0.18	0.22	0.18	0.18	0.22	0.18	0.35	0.39	0.35	0.35	0.39	0.35
Sat Flow, veh/h	739	400	408	29	418	1085	105	1462	35	84	1137	427
Grp Volume(v), veh/h	129	0	0	175	0	0	407	0	0	309	0	0
Grp Sat Flow(s),veh/h/ln	1546	0	0	1531	0	0	1603	0	0	1648	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.6	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	0.0	2.7	0.0	0.0	5.4	0.0	0.0	3.6	0.0	0.0
Prop In Lane	0.56		0.26	0.03		0.71	0.12		0.02	0.10		0.26
Lane Grp Cap(c), veh/h	494	0	0	418	0	0	725	0	0	739	0	0
V/C Ratio(X)	0.26	0.00	0.00	0.42	0.00	0.00	0.56	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	1128	0	0	1155	0	0	2045	0	0	2073	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.9	0.0	0.0	9.2	0.0	0.0	6.4	0.0	0.0	6.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.0	0.0	0.7	0.0	0.0	0.4	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	0.4	0.0	0.0	0.6	0.0	0.0	1.2	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	0.0	0.0	9.9	0.0	0.0	7.1	0.0	0.0	6.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	129			175			407			309		
Approach Delay, s/veh	9.2			9.9			7.1			6.3		
Approach LOS	A			A			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	15.1			10.6			15.1			10.6		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	31.0			17.0			31.0			17.0		
Max Q Clear Time (g_c+I1), s	7.4			3.7			5.6			4.7		
Green Ext Time (p_c), s	1.7			0.3			1.4			0.5		
Intersection Summary												
HCM 6th Ctrl Delay	7.6											
HCM 6th LOS	A											

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	81	76	4	51	65	32	294	6	95	349	54
Future Volume (vph)	84	81	76	4	51	65	32	294	6	95	349	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1316	0	0	1486	0	0	1583	0	0	1488	0
Flt Permitted		0.846			0.985			0.929			0.867	
Satd. Flow (perm)	0	1133	0	0	1466	0	0	1478	0	0	1302	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		45			68			3			19	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	251	0	0	125	0	0	345	0	0	519	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.0	22.0		22.0	22.0	
Total Split (s)	18.0	18.0		18.0	18.0		32.0	32.0		32.0	32.0	
Total Split (%)	36.0%	36.0%		36.0%	36.0%		64.0%	64.0%		64.0%	64.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		12.2			12.2			25.0			25.0	
Actuated g/C Ratio		0.26			0.26			0.53			0.53	
v/c Ratio		0.77			0.29			0.44			0.74	
Control Delay		33.1			10.1			9.2			17.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		33.1			10.1			9.2			17.3	
LOS		C			B			A			B	
Approach Delay		33.1			10.1			9.2			17.3	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		50			12			53			97	
Queue Length 95th (ft)		#158			46			101			#252	
Internal Link Dist (ft)		1066			1154			917			948	
Turn Bay Length (ft)												
Base Capacity (vph)		344			453			853			758	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.73			0.28			0.40			0.68	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 47.3

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 17.5

Intersection LOS: B

Intersection Capacity Utilization 77.8%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
32 s	18 s
 Ø6	 Ø8
32 s	18 s

HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	81	76	4	51	65	32	294	6	95	349	54
Future Volume (veh/h)	84	81	76	4	51	65	32	294	6	95	349	54
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	88	84	79	4	53	68	33	306	6	99	364	56
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	258	155	119	122	176	215	156	667	12	225	534	75
Arrive On Green	0.22	0.25	0.22	0.22	0.25	0.22	0.40	0.44	0.40	0.40	0.44	0.40
Sat Flow, veh/h	421	621	479	20	704	863	73	1530	28	207	1225	173
Grp Volume(v), veh/h	251	0	0	125	0	0	345	0	0	519	0	0
Grp Sat Flow(s),veh/h/ln	1521	0	0	1587	0	0	1631	0	0	1605	0	0
Q Serve(g_s), s	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	0.0
Cycle Q Clear(g_c), s	4.8	0.0	0.0	2.1	0.0	0.0	4.8	0.0	0.0	8.6	0.0	0.0
Prop In Lane	0.35		0.31	0.03		0.54	0.10		0.02	0.19		0.11
Lane Grp Cap(c), veh/h	485	0	0	463	0	0	784	0	0	784	0	0
V/C Ratio(X)	0.52	0.00	0.00	0.27	0.00	0.00	0.44	0.00	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	715	0	0	711	0	0	1420	0	0	1415	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.0	0.0	0.0	10.0	0.0	0.0	6.4	0.0	0.0	7.5	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	1.0	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(95%),veh/ln	2.3	0.0	0.0	1.0	0.0	0.0	2.2	0.0	0.0	3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	0.0	0.0	10.3	0.0	0.0	6.8	0.0	0.0	8.5	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h	251		125				345			519		
Approach Delay, s/veh	11.8		10.3				6.8			8.5		
Approach LOS	B		B				A			A		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	18.9		12.9		18.9		12.9					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	26.0		12.0		26.0		12.0					
Max Q Clear Time (g_c+I1), s	6.8		6.8		10.6		4.1					
Green Ext Time (p_c), s	1.4		0.4		2.2		0.2					
Intersection Summary												
HCM 6th Ctrl Delay			8.9									
HCM 6th LOS			A									

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	49	32	15	32	60	19	218	7	37	220	42
Future Volume (vph)	46	49	32	15	32	60	19	218	7	37	220	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1588	0	0	1536	0	0	1681	0	0	1751	0
Flt Permitted		0.834			0.926			0.960			0.936	
Satd. Flow (perm)	0	1349	0	0	1432	0	0	1620	0	0	1649	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			63			3			17	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	132	0	0	112	0	0	254	0	0	312	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	29.0	29.0		29.0	29.0		46.0	46.0		46.0	46.0	
Total Split (%)	38.7%	38.7%		38.7%	38.7%		61.3%	61.3%		61.3%	61.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		9.3			9.2			17.9			17.9	
Actuated g/C Ratio		0.28			0.28			0.54			0.54	
v/c Ratio		0.34			0.25			0.29			0.35	
Control Delay		11.2			7.1			8.0			8.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		11.2			7.1			8.0			8.1	
LOS		B			A			A			A	
Approach Delay		11.2			7.1			8.0			8.1	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		13			6			27			33	
Queue Length 95th (ft)		48			32			72			86	
Internal Link Dist (ft)		930			1052			920			945	
Turn Bay Length (ft)												
Base Capacity (vph)		995			1066			1620			1649	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.13			0.11			0.16			0.19	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 33.3

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 8.4

Intersection LOS: A

Intersection Capacity Utilization 48.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 29: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
46 s	29 s
 Ø6	 Ø8
46 s	29 s

HCM 6th Signalized Intersection Summary

29: Colebrook Rd & Harrisburg Ave

2024 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	49	32	15	32	60	19	218	7	37	220	42
Future Volume (veh/h)	46	49	32	15	32	60	19	218	7	37	220	42
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	1724	1780	1837	1837	1795	1837	1724	1766	1794	1986	1958	1858
Adj Flow Rate, veh/h	48	51	33	16	33	62	20	227	7	39	229	44
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	8	4	0	0	3	0	5	2	0	0	2	9
Cap, veh/h	338	119	75	231	100	174	206	543	16	236	488	88
Arrive On Green	0.14	0.19	0.14	0.14	0.19	0.14	0.29	0.34	0.29	0.29	0.34	0.29
Sat Flow, veh/h	564	627	397	197	526	915	68	1595	47	135	1434	258
Grp Volume(v), veh/h	132	0	0	111	0	0	254	0	0	312	0	0
Grp Sat Flow(s),veh/h/ln	1588	0	0	1638	0	0	1711	0	0	1826	0	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.0	1.2	0.0	0.0	2.5	0.0	0.0	2.9	0.0	0.0
Prop In Lane	0.36		0.25	0.14		0.56	0.08		0.03	0.12		0.14
Lane Grp Cap(c), veh/h	458	0	0	428	0	0	684	0	0	726	0	0
V/C Ratio(X)	0.29	0.00	0.00	0.26	0.00	0.00	0.37	0.00	0.00	0.43	0.00	0.00
Avail Cap(c_a), veh/h	1843	0	0	1875	0	0	3326	0	0	3536	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.9	0.0	0.0	7.8	0.0	0.0	5.5	0.0	0.0	5.7	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.4	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(95%),veh/ln	0.6	0.0	0.0	0.5	0.0	0.0	0.9	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.2	0.0	0.0	8.1	0.0	0.0	5.8	0.0	0.0	6.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		132			111			254			312	
Approach Delay, s/veh		8.2			8.1			5.8			6.1	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		12.2		9.1		12.2		9.1				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		40.0		23.0		40.0		23.0				
Max Q Clear Time (g_c+I1), s		4.5		3.5		4.9		3.2				
Green Ext Time (p_c), s		1.0		0.4		1.3		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				6.6								
HCM 6th LOS				A								

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	33	95	9	40	35	78	706	13	49	951	319
Future Volume (vph)	218	33	95	9	40	35	78	706	13	49	951	319
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1670	0	1416	1704	0	1620	1694	0	1628	1678	0
Flt Permitted	0.706			0.671			0.096			0.306		
Satd. Flow (perm)	1204	1670	0	1000	1704	0	164	1694	0	524	1678	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		100			37			4			65	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	229	135	0	9	79	0	82	757	0	52	1337	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	13.0	13.0		13.0	13.0		47.0	47.0		47.0	47.0	
Total Split (%)	21.7%	21.7%		21.7%	21.7%		78.3%	78.3%		78.3%	78.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	8.0	8.0		8.0	8.0		41.5	41.5		41.5	41.5	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.69	0.69		0.69	0.69	
v/c Ratio	1.43	0.44		0.07	0.31		0.73	0.65		0.14	1.13	
Control Delay	253.0	14.0		24.2	18.2		42.3	10.5		4.3	84.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	253.0	14.0		24.2	18.2		42.3	10.5		4.3	84.9	
LOS	F	B		C	B		D	B		A	F	
Approach Delay		164.4			18.8			13.6			81.9	
Approach LOS		F			B			B			F	
Queue Length 50th (ft)	~116	11		3	14		33	295		5	~577	
Queue Length 95th (ft)	#233	55		14	47		m#79	237		15	#808	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2024 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	160	309		133	259		113	1172		362	1180	
Starvation Cap Reductn	0	0		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	1.43	0.44		0.07	0.31		0.73	0.65		0.14	1.13	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.43

Intersection Signal Delay: 69.7

Intersection LOS: E

Intersection Capacity Utilization 101.5%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

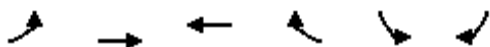
11: Cloverleaf Rd & Schwanger Rd

2024 Build w/ Improvements
PM Peak Hour

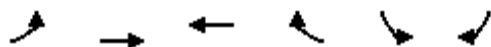
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	33	95	9	40	35	78	706	13	49	951	319
Future Volume (veh/h)	218	33	95	9	40	35	78	706	13	49	951	319
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	229	35	76	9	42	23	82	743	13	52	1001	325
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	259	77	168	204	147	81	120	1257	22	407	960	312
Arrive On Green	0.13	0.13	0.12	0.13	0.13	0.12	0.46	0.46	0.45	0.69	0.69	0.68
Sat Flow, veh/h	1409	580	1259	1094	1105	605	423	1817	32	738	1389	451
Grp Volume(v), veh/h	229	0	111	9	0	65	82	0	756	52	0	1326
Grp Sat Flow(s),veh/h/ln	1409	0	1839	1094	0	1711	423	0	1849	738	0	1839
Q Serve(g_s), s	5.9	0.0	3.4	0.5	0.0	2.1	0.0	0.0	18.1	2.8	0.0	41.5
Cycle Q Clear(g_c), s	8.0	0.0	3.4	3.8	0.0	2.1	41.5	0.0	18.1	20.9	0.0	41.5
Prop In Lane	1.00		0.68	1.00		0.35	1.00		0.02	1.00		0.25
Lane Grp Cap(c), veh/h	259	0	245	204	0	228	120	0	1279	407	0	1272
V/C Ratio(X)	0.88	0.00	0.45	0.04	0.00	0.28	0.68	0.00	0.59	0.13	0.00	1.04
Avail Cap(c_a), veh/h	259	0	245	204	0	228	120	0	1279	407	0	1272
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.69	0.00	0.69	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	24.3	25.8	0.0	23.6	36.8	0.0	9.8	12.0	0.0	9.4
Incr Delay (d2), s/veh	27.9	0.0	1.3	0.1	0.0	0.7	19.6	0.0	1.4	0.6	0.0	37.0
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(95%),veh/ln	8.8	0.0	2.6	0.2	0.0	1.5	3.3	0.0	11.2	0.8	0.0	29.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.1	0.0	25.6	25.8	0.0	24.3	56.5	0.0	11.2	12.7	0.0	46.3
LnGrp LOS	E	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	340			74			838			1378		
Approach Delay, s/veh	46.1			24.5			15.7			45.1		
Approach LOS	D			C			B			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	47.0			13.0			47.0			13.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	40.5			7.0			40.5			7.0		
Max Q Clear Time (g_c+I1), s	20.1			10.0			43.5			5.8		
Green Ext Time (p_c), s	15.2			0.0			0.0			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	35.2											
HCM 6th LOS	D											

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2024 Build w/ Improvements
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	113	285	387	51	65	141
Future Volume (vph)	113	285	387	51	65	141
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			325	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1710	1651	1714	1500	1676	1500
Flt Permitted	0.415				0.950	
Satd. Flow (perm)	747	1651	1714	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				57		157
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2697		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	9%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	126	317	430	57	72	157
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	22.0	22.0	22.0	22.0	13.0
Total Split (s)	13.0	56.0	43.0	43.0	24.0	13.0
Total Split (%)	16.3%	70.0%	53.8%	53.8%	30.0%	16.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	6.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	62.3	63.3	49.1	49.1	10.0	19.9
Actuated g/C Ratio	0.78	0.79	0.61	0.61	0.12	0.25
v/c Ratio	0.19	0.24	0.41	0.06	0.34	0.32
Control Delay	3.7	3.8	11.1	3.0	35.7	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.8	11.1	3.0	35.7	5.4
LOS	A	A	B	A	D	A
Approach Delay		3.7	10.1		15.0	
Approach LOS		A	B		B	
Queue Length 50th (ft)	13	38	108	0	33	0
Queue Length 95th (ft)	31	77	204	16	69	38
Internal Link Dist (ft)		730	2617		420	
Turn Bay Length (ft)	350			325	175	
Base Capacity (vph)	685	1307	1052	943	398	497



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.18	0.24	0.41	0.06	0.18	0.32

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 8.6

Intersection LOS: A

Intersection Capacity Utilization 44.4%

ICU Level of Service A

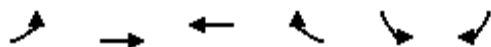
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2024 Build w/ Improvements
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	113	285	387	51	65	141
Future Volume (veh/h)	113	285	387	51	65	141
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	1800	1674	1730	1772	1772	1772
Adj Flow Rate, veh/h	126	317	430	57	72	157
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	9	5	2	2	2
Cap, veh/h	617	1232	1062	922	235	261
Arrive On Green	0.06	0.74	0.61	0.61	0.14	0.13
Sat Flow, veh/h	1714	1674	1730	1502	1688	1502
Grp Volume(v), veh/h	126	317	430	57	72	157
Grp Sat Flow(s),veh/h/ln	1714	1674	1730	1502	1688	1502
Q Serve(g_s), s	1.9	4.9	10.2	1.2	3.1	7.7
Cycle Q Clear(g_c), s	1.9	4.9	10.2	1.2	3.1	7.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	617	1232	1062	922	235	261
V/C Ratio(X)	0.20	0.26	0.40	0.06	0.31	0.60
Avail Cap(c_a), veh/h	687	1232	1062	922	401	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.0	3.4	7.9	6.2	31.0	30.5
Incr Delay (d2), s/veh	0.2	0.5	1.1	0.1	0.7	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.1	3.2	0.3	1.3	2.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.2	3.9	9.1	6.3	31.7	32.7
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		443	487		229	
Approach Delay, s/veh		4.3	8.8		32.4	
Approach LOS		A	A		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.8	54.1			63.9	16.1
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	37.0			50.0	18.0
Max Q Clear Time (g_c+I1), s	3.9	12.2			6.9	9.7
Green Ext Time (p_c), s	0.1	1.8			1.1	0.5

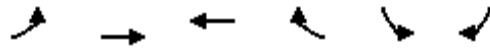
Intersection Summary

HCM 6th Ctrl Delay	11.7
HCM 6th LOS	B

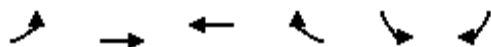
Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2024 Build w/ Improvements

PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	169	447	448	77	150	326
Future Volume (vph)	169	447	448	77	150	326
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1748	1500	1676	1500
Flt Permitted	0.379				0.950	
Satd. Flow (perm)	669	1782	1748	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				86		293
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	3%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	497	498	86	167	362
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	22.0	22.0	22.0	22.0	13.0
Total Split (s)	19.0	83.0	64.0	64.0	37.0	19.0
Total Split (%)	15.8%	69.2%	53.3%	53.3%	30.8%	15.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	6.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	91.5	91.5	75.4	75.4	18.5	33.6
Actuated g/C Ratio	0.76	0.76	0.63	0.63	0.15	0.28
v/c Ratio	0.31	0.37	0.45	0.09	0.65	0.57
Control Delay	4.5	4.8	14.7	2.9	58.9	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	4.8	14.7	2.9	58.9	10.7
LOS	A	A	B	A	E	B
Approach Delay		4.7	13.0		25.9	
Approach LOS		A	B		C	
Queue Length 50th (ft)	25	109	183	0	123	41
Queue Length 95th (ft)	m60	176	340	24	186	115
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	630	1359	1098	974	446	663



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.30	0.37	0.45	0.09	0.37	0.55

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 13.6

Intersection LOS: B

Intersection Capacity Utilization 56.0%

ICU Level of Service B

Analysis Period (min) 15

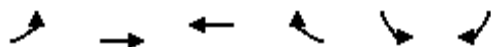
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

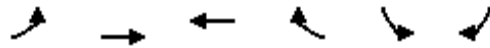
2024 Build w/ Improvements
PM Peak Hour



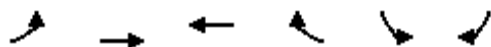
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	169	447	448	77	150	326
Future Volume (veh/h)	169	447	448	77	150	326
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1772	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	188	497	498	86	167	362
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	3	2	2	2
Cap, veh/h	479	1190	967	826	423	463
Arrive On Green	0.15	1.00	0.55	0.55	0.25	0.24
Sat Flow, veh/h	1688	1786	1758	1502	1688	1502
Grp Volume(v), veh/h	188	497	498	86	167	362
Grp Sat Flow(s),veh/h/ln	1688	1786	1758	1502	1688	1502
Q Serve(g_s), s	5.7	0.0	21.3	3.3	9.9	26.4
Cycle Q Clear(g_c), s	5.7	0.0	21.3	3.3	9.9	26.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	479	1190	967	826	423	463
V/C Ratio(X)	0.39	0.42	0.51	0.10	0.40	0.78
Avail Cap(c_a), veh/h	550	1190	967	826	450	487
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.7	0.0	16.9	12.9	37.4	37.8
Incr Delay (d2), s/veh	0.5	1.1	2.0	0.3	0.6	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.0	0.6	13.2	2.0	7.6	16.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.2	1.1	18.9	13.1	38.0	45.6
LnGrp LOS	B	A	B	B	D	D
Approach Vol, veh/h		685	584		529	
Approach Delay, s/veh		3.9	18.0		43.2	
Approach LOS		A	B		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.9	71.0			85.0	35.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	13.0	58.0			77.0	31.0
Max Q Clear Time (g_c+l1), s	7.7	23.3			2.0	28.4
Green Ext Time (p_c), s	0.3	2.3			1.9	0.7
Intersection Summary						
HCM 6th Ctrl Delay			20.0			
HCM 6th LOS			C			

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2024 Build w/ Improvements
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	188	363	465	94	150	300
Future Volume (vph)	188	363	465	94	150	300
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1782	1500	1676	1500
Flt Permitted	0.300				0.950	
Satd. Flow (perm)	529	1782	1782	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				104		236
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	209	403	517	104	167	333
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	15.0	53.0	38.0	38.0	22.0	15.0
Total Split (%)	20.0%	70.7%	50.7%	50.7%	29.3%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	51.5	51.5	37.0	37.0	13.5	28.0
Actuated g/C Ratio	0.69	0.69	0.49	0.49	0.18	0.37
v/c Ratio	0.41	0.33	0.59	0.13	0.56	0.47
Control Delay	7.3	6.1	18.2	3.4	34.7	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	6.1	18.2	3.4	34.7	7.2
LOS	A	A	B	A	C	A
Approach Delay		6.5	15.7		16.4	
Approach LOS		A	B		B	
Queue Length 50th (ft)	30	65	166	0	71	29
Queue Length 95th (ft)	61	122	287	25	123	81
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	520	1224	879	792	379	719



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.40	0.33	0.59	0.13	0.44	0.46

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 12.7

Intersection LOS: B

Intersection Capacity Utilization 58.1%

ICU Level of Service B

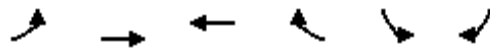
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2024 Build w/ Improvements
SAT Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	188	363	465	94	150	300
Future Volume (veh/h)	188	363	465	94	150	300
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	1772	1786	1786	1772	1772	1772
Adj Flow Rate, veh/h	209	403	517	104	167	333
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	1	2	2	2
Cap, veh/h	460	1143	849	714	383	487
Arrive On Green	0.10	0.64	0.48	0.48	0.23	0.23
Sat Flow, veh/h	1688	1786	1786	1502	1688	1502
Grp Volume(v), veh/h	209	403	517	104	167	333
Grp Sat Flow(s),veh/h/ln	1688	1786	1786	1502	1688	1502
Q Serve(g_s), s	4.2	7.9	16.0	2.9	6.4	14.4
Cycle Q Clear(g_c), s	4.2	7.9	16.0	2.9	6.4	14.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	460	1143	849	714	383	487
V/C Ratio(X)	0.45	0.35	0.61	0.15	0.44	0.68
Avail Cap(c_a), veh/h	520	1143	849	714	383	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	6.3	14.5	11.1	24.9	22.0
Incr Delay (d2), s/veh	0.7	0.9	3.2	0.4	0.8	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	4.2	10.2	1.6	4.6	9.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.5	7.1	17.8	11.5	25.7	25.9
LnGrp LOS	B	A	B	B	C	C
Approach Vol, veh/h		612	621		500	
Approach Delay, s/veh		8.3	16.7		25.8	
Approach LOS		A	B		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.3	40.7			53.0	22.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	9.0	32.0			47.0	16.0
Max Q Clear Time (g_c+I1), s	6.2	18.0			9.9	16.4
Green Ext Time (p_c), s	0.2	2.1			1.5	0.0
Intersection Summary						
HCM 6th Ctrl Delay			16.4			
HCM 6th LOS			B			

APPENDIX L5

2029 NO BUILD CONDITION ANALYSES

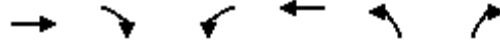
Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 No Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	411	80	82	366	146	142
Future Volume (vph)	411	80	82	366	146	142
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1681	0	1662	1766	1534	0
Flt Permitted			0.249		0.975	
Satd. Flow (perm)	1681	0	436	1766	1534	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	17					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	546	0	91	407	320	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.6		42.4	41.2	18.4	
Actuated g/C Ratio	0.45		0.61	0.59	0.26	
v/c Ratio	0.71		0.23	0.39	0.79	
Control Delay	23.1		5.3	6.4	40.6	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	23.1		5.3	6.4	40.6	
LOS	C		A	A	D	
Approach Delay	23.1			6.2	40.6	
Approach LOS	C			A	D	
Queue Length 50th (ft)	191		12	57	127	
Queue Length 95th (ft)	#353		m22	81	#250	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 No Build
AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	769		403	1038	411	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.71		0.23	0.39	0.78	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 21.1

Intersection LOS: C

Intersection Capacity Utilization 62.6%

ICU Level of Service B

Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2029 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	411	80	82	366	146	142
Future Volume (veh/h)	411	80	82	366	146	142
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	457	83	91	407	162	158
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	652	118	432	1178	197	193
Arrive On Green	0.48	0.47	0.15	1.00	0.24	0.23
Sat Flow, veh/h	1357	246	1846	1927	822	801
Grp Volume(v), veh/h	0	540	91	407	321	0
Grp Sat Flow(s),veh/h/ln	0	1603	1846	1927	1628	0
Q Serve(g_s), s	0.0	18.5	1.5	0.0	13.1	0.0
Cycle Q Clear(g_c), s	0.0	18.5	1.5	0.0	13.1	0.0
Prop In Lane		0.15	1.00		0.50	0.49
Lane Grp Cap(c), veh/h	0	770	432	1178	391	0
V/C Ratio(X)	0.00	0.70	0.21	0.35	0.82	0.00
Avail Cap(c_a), veh/h	0	770	508	1178	437	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	14.3	8.9	0.0	25.4	0.0
Incr Delay (d2), s/veh	0.0	5.3	0.2	0.8	15.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	11.1	0.8	0.5	10.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	19.6	9.2	0.8	41.0	0.0
LnGrp LOS	A	B	A	A	D	A
Approach Vol, veh/h	540			498	321	
Approach Delay, s/veh	19.6			2.3	41.0	
Approach LOS	B			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.1	38.8		22.0		48.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.5	20.5		15.1		2.0
Green Ext Time (p_c), s	0.1	4.6		0.8		10.5
Intersection Summary						
HCM 6th Ctrl Delay			18.3			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	582	1	0	544	42	0	0	2	42	0	35
Future Volume (vph)	26	582	1	0	544	42	0	0	2	42	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	655	0	0	658	0	0	2	0	47	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 47.0%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	582	1	0	544	42	0	0	2	42	0	35
Future Vol, veh/h	26	582	1	0	544	42	0	0	2	42	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	29	654	1	0	611	47	0	0	2	47	0	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	658	0	0	655	0	0	1368	1371	656	1350	1348	636
Stage 1	-	-	-	-	-	-	713	713	-	635	635	-
Stage 2	-	-	-	-	-	-	655	658	-	715	713	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	746	-	-	572	-	-	158	172	417	175	191	473
Stage 1	-	-	-	-	-	-	515	475	-	586	529	-
Stage 2	-	-	-	-	-	-	552	500	-	534	494	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	746	-	-	572	-	-	140	165	417	169	184	473
Mov Cap-2 Maneuver	-	-	-	-	-	-	140	165	-	169	184	-
Stage 1	-	-	-	-	-	-	495	456	-	563	529	-
Stage 2	-	-	-	-	-	-	506	500	-	510	475	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	13.7	24.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	417	746	-	-	572	-	-	169	473
HCM Lane V/C Ratio	0.005	0.039	-	-	-	-	-	0.279	0.083
HCM Control Delay (s)	13.7	10	-	-	0	-	-	34.4	13.3
HCM Lane LOS	B	B	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1.1	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	491	45	64	474	6	104	2	73	4	3	2
Future Volume (vph)	3	491	45	64	474	6	104	2	73	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.468			0.330			0.754			0.703		
Satd. Flow (perm)	814	1667	1552	535	1558	1608	1302	1516	0	1303	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45		81			2	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	546	50	71	527	7	116	83	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	42.2	42.2	42.2	52.2	52.1	52.1	10.8	10.8		10.7	10.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.54	0.05	0.14	0.45	0.01	0.58	0.27		0.02	0.02	
Control Delay	6.7	8.8	0.1	1.6	3.1	0.0	39.1	9.7		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	8.8	0.1	1.6	3.1	0.0	39.1	9.7		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		8.1			2.9			26.8			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	84	0	7	61	0	46	1		1	1	
Queue Length 95th (ft)	m1	m117	m0	2	11	m0	95	35		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	491	1005	988	521	1159	1208	225	329		225	320	
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	0.01	0.54	0.05	0.14	0.45	0.01	0.52	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 8.6

Intersection LOS: A

Intersection Capacity Utilization 65.3%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	491	45	64	474	6	104	2	73	4	3	2
Future Volume (veh/h)	3	491	45	64	474	6	104	2	73	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	546	34	71	527	6	116	2	43	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	686	1183	1047	654	1165	1116	283	9	199	259	145	97
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	960	1947	1722	1640	1609	1542	1461	75	1612	1467	1176	784
Grp Volume(v), veh/h	3	546	34	71	527	6	116	0	45	4	0	5
Grp Sat Flow(s),veh/h/ln	960	1947	1722	1640	1609	1542	1461	0	1687	1467	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	5.3	0.0	1.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.0	0.0	0.0	5.3	0.0	1.7	1.4	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	686	1183	1047	654	1165	1116	283	0	208	259	0	242
V/C Ratio(X)	0.00	0.46	0.03	0.11	0.45	0.01	0.41	0.00	0.22	0.02	0.00	0.02
Avail Cap(c_a), veh/h	686	1183	1047	768	1165	1116	355	0	292	331	0	339
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)	1.00	1.00	1.00	0.92	0.92	0.92	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.3	0.0	0.0	29.2	0.0	28.1	28.0	0.0	27.1
Incr Delay (d2), s/veh	0.0	1.3	0.1	0.1	1.2	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.8	0.0	0.3	0.7	0.0	3.4	0.0	1.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.3	0.1	3.3	1.2	0.0	30.2	0.0	28.6	28.1	0.0	27.2
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	583			604			161			9		
Approach Delay, s/veh	1.2			1.4			29.7			27.6		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.1	48.3	13.5		56.5		13.5					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.5	2.5	3.9		2.5		7.8					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.9
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	416	14	5	510	13	9	0	15	6	0	8
Future Volume (vph)	26	416	14	5	510	13	9	0	15	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1659	0	1744	1654	1445	0	1727	0	1719	1501	0
Flt Permitted	0.386			0.497				0.870				
Satd. Flow (perm)	681	1659	0	912	1654	1415	0	1530	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				126		139			406	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	462	0	5	548	14	0	26	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.31		0.01	0.40	0.01		0.09		0.03	0.02	
Control Delay	0.9	2.3		4.0	5.1	0.0		0.7		28.5	0.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.9	2.3		4.0	5.1	0.0		0.7		28.5	0.0	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.2			5.0			0.7			11.4	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m2	66		m2	167	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	681	1492		763	1383	1204		325		242	553	
Starvation Cap Reductn	0	0		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	0.04	0.31		0.01	0.40	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 3.7

Intersection LOS: A

Intersection Capacity Utilization 44.8%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

		
Ø1	Ø2 (R)	Ø4
11 s	45 s	14 s
		
Ø5 (R)		Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2029 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	416	14	5	510	13	9	0	15	6	0	8
Future Volume (veh/h)	26	416	14	5	510	13	9	0	15	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	28	447	15	5	548	14	10	0	15	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	716	1282	43	803	1295	1123	88	0	24	161	70	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1564	52	969	1793	1554	418	0	626	1360	1837	0
Grp Volume(v), veh/h	28	0	462	5	548	14	25	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1617	969	1793	1554	1044	0	0	1360	1837	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.40		0.60	1.00		0.00
Lane Grp Cap(c), veh/h	716	0	1325	803	1295	1123	97	0	0	161	70	0
V/C Ratio(X)	0.04	0.00	0.35	0.01	0.42	0.01	0.26	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	814	0	1325	803	1295	1123	241	0	0	292	247	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)	0.83	0.00	0.83	0.92	0.92	0.92	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	33.9	0.0	0.0	32.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.0	0.9	0.0	1.4	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.4	0.0	0.6	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.6	0.0	0.9	0.0	35.3	0.0	0.0	32.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	490			567			25			6		
Approach Delay, s/veh	0.7			0.9			35.3			32.6		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.8	56.0		7.3		62.7		7.3				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	38.6		8.4		49.6		8.4				
Max Q Clear Time (g_c+I1), s	2.8	2.5		2.7		2.5		3.7				
Green Ext Time (p_c), s	0.0	0.7		0.0		0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				1.8								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	386	1	10	412	25	60	27	36	29	16	47
Future Volume (vph)	38	386	1	10	412	25	60	27	36	29	16	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1591	0	1248	1497	0	0	1795	0
Flt Permitted	0.473			0.508			0.759				0.870	
Satd. Flow (perm)	839	1685	0	666	1591	0	997	1497	0	0	1584	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			39			51	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	416	0	11	470	0	65	68	0	0	99	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.3	52.3		52.3	52.3		11.1	11.1			11.1	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.07	0.33		0.02	0.39		0.41	0.25			0.34	
Control Delay	1.1	1.4		4.5	6.0		33.2	15.3			16.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.4		4.5	6.0		33.2	15.3			16.8	
LOS	A	A		A	A		C	B			B	
Approach Delay		1.4			6.0			24.0			16.8	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	7		1	68		26	11			18	
Queue Length 95th (ft)	3	17		7	151		56	40			52	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	626	1258		497	1190		284	455			489	
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	0.07	0.33		0.02	0.39		0.23	0.15			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 7.1

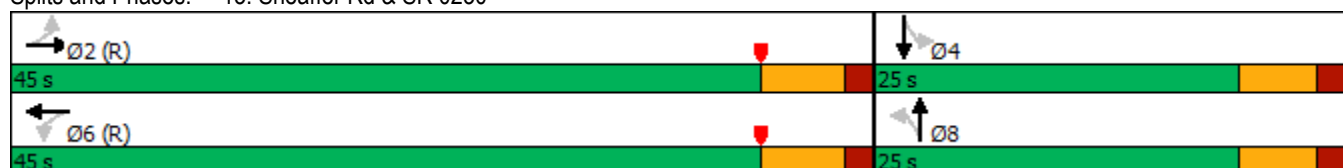
Intersection LOS: A

Intersection Capacity Utilization 53.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2029 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	386	1	10	412	25	60	27	36	29	16	47
Future Volume (veh/h)	38	386	1	10	412	25	60	27	36	29	16	47
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		0.99	1.00		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	41	415	0	11	443	26	65	29	17	31	17	33
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	687	1276	0	689	1298	76	218	98	58	114	45	60
Arrive On Green	1.00	1.00	0.00	0.76	0.76	0.75	0.10	0.10	0.08	0.08	0.10	0.08
Sat Flow, veh/h	865	1680	0	771	1708	100	1000	999	585	431	455	609
Grp Volume(v), veh/h	41	415	0	11	0	469	65	0	46	81	0	0
Grp Sat Flow(s),veh/h/ln	865	1680	0	771	0	1808	1000	0	1584	1496	0	0
Q Serve(g_s), s	0.4	0.0	0.0	0.2	0.0	5.9	0.0	0.0	1.9	2.0	0.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	0.0	0.2	0.0	5.9	3.3	0.0	1.9	3.9	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.06	1.00		0.37	0.38		0.41
Lane Grp Cap(c), veh/h	687	1276	0	689	0	1374	218	0	156	197	0	0
V/C Ratio(X)	0.06	0.33	0.00	0.02	0.00	0.34	0.30	0.00	0.29	0.41	0.00	0.00
Avail Cap(c_a), veh/h	687	1276	0	689	0	1374	405	0	453	507	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(l)	0.96	0.96	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.3	0.0	0.0	2.0	0.0	2.7	29.9	0.0	29.5	30.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.7	0.0	0.0	0.0	0.7	0.8	0.0	1.0	1.4	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(95%),veh/ln	0.1	0.4	0.0	0.0	0.0	2.0	1.9	0.0	1.3	2.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	0.7	0.0	2.1	0.0	3.4	30.7	0.0	30.5	32.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	456			480			111			81		
Approach Delay, s/veh	0.6			3.4			30.6			32.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	58.1			11.9			58.1			11.9		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			5.9			7.9			5.3		
Green Ext Time (p_c), s	11.9			0.2			13.2			0.3		
Intersection Summary												
HCM 6th Ctrl Delay			7.0									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	330	0	90	535	140	0	0	191	57
Future Volume (vph)	0	0	0	330	0	90	535	140	0	0	191	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.472					
Satd. Flow (perm)	0	0	0	0	1546	1145	767	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	344	94	557	146	0	0	199	59
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					15.7	15.7	32.6	32.6			15.6	15.6
Actuated g/C Ratio					0.27	0.27	0.56	0.56			0.27	0.27
v/c Ratio					0.82	0.22	0.94	0.18			0.48	0.11
Control Delay					38.8	2.1	38.4	7.0			22.6	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					38.8	2.1	38.4	7.0			22.6	0.4
LOS					D	A	D	A			C	A
Approach Delay					30.9			31.9			17.5	
Approach LOS					C			C			B	
Queue Length 50th (ft)					115	0	121	23			59	0
Queue Length 95th (ft)					#241	9	#371	46			113	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					441	443	594	837			449	557
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					0.78	0.21	0.94	0.17			0.44	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 57.9

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 28.9

Intersection LOS: C

Intersection Capacity Utilization 88.6%

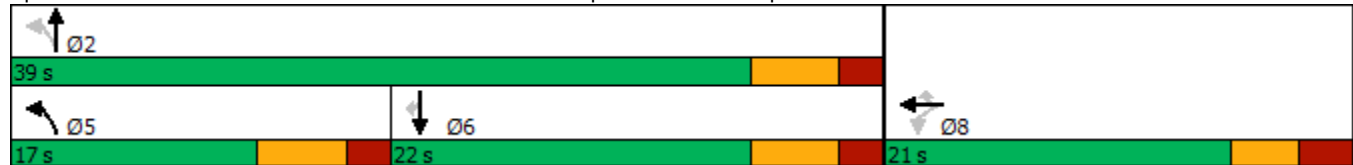
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	330	0	90	535	140	0	0	191	57
Future Volume (veh/h)	0	0	0	330	0	90	535	140	0	0	191	57
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				344	0	0	557	146	0	0	199	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				444	0		660	846	0	0	411	
Arrive On Green				0.23	0.00	0.00	0.23	0.57	0.00	0.00	0.25	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				344	0	0	557	146	0	0	199	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				9.5	0.0	0.0	12.0	2.5	0.0	0.0	5.4	0.0
Cycle Q Clear(g_c), s				9.5	0.0	0.0	12.0	2.5	0.0	0.0	5.4	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				444	0		660	846	0	0	411	
V/C Ratio(X)				0.78	0.00		0.84	0.17	0.00	0.00	0.48	
Avail Cap(c_a), veh/h				560	0		660	959	0	0	537	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.9	0.0	0.0	11.3	5.4	0.0	0.0	16.9	0.0
Incr Delay (d2), s/veh				5.3	0.0	0.0	9.7	0.3	0.0	0.0	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				7.7	0.0	0.0	8.6	1.0	0.0	0.0	3.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				24.1	0.0	0.0	21.1	5.7	0.0	0.0	20.1	0.0
LnGrp LOS				C	A		C	A	A	A	C	
Approach Vol, veh/h					344			703			199	
Approach Delay, s/veh					24.1			17.9			20.1	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		17.6				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		4.5			14.0	7.4		11.5				
Green Ext Time (p_c), s		3.1			0.0	2.0		0.7				
Intersection Summary												
HCM 6th Ctrl Delay				20.0								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2	243	0	0	0	0	643	579	109	404	0
Future Volume (vph)	32	2	243	0	0	0	0	643	579	109	404	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	259	0	0	0	0	1300	0	116	430	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 88.6% ICU Level of Service E

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2029 No Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	32	2	243	0	0	0	0	643	579	109	404	0
Future Vol, veh/h	32	2	243	0	0	0	0	643	579	109	404	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	34	2	259	0	0	0	0	684	616	116	430	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1346	1346	430	-	0	0	684	0	0
Stage 1	662	662	-	-	-	-	-	-	-
Stage 2	684	684	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	160	191	662	0	-	-	719	-	0
Stage 1	612	516	-	0	-	-	-	-	0
Stage 2	599	506	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	134	0	662	-	-	-	719	-	-
Mov Cap-2 Maneuver	134	0	-	-	-	-	-	-	-
Stage 1	612	0	-	-	-	-	-	-	-
Stage 2	503	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.3	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	134	662	719	-
HCM Lane V/C Ratio	-	-	0.27	0.39	0.161	-
HCM Control Delay (s)	-	-	41.5	13.9	11	-
HCM Lane LOS	-	-	E	B	B	-
HCM 95th %tile Q(veh)	-	-	1	1.9	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 No Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	25	0	1205	638	5
Future Volume (vph)	6	25	0	1205	638	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1622	0	0	1734	1653	0
Flt Permitted	0.990					
Satd. Flow (perm)	1622	0	0	1734	1653	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	1339	715	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	73.4%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 No Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	0	1205	638	5
Future Vol, veh/h	6	25	0	1205	638	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	28	0	1339	709	6

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2051	712	715	0	-	0
Stage 1	712	-	-	-	-	-
Stage 2	1339	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	65	456	734	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	267	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	65	456	734	-	-	-
Mov Cap-2 Maneuver	65	-	-	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	267	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.4	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	734	-	211	-	-
HCM Lane V/C Ratio	-	-	0.163	-	-
HCM Control Delay (s)	0	-	25.4	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	20	90	8	13	76	32	783	8	10	513	153
Future Volume (vph)	345	20	90	8	13	76	32	783	8	10	513	153
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1578	0	1391	1564	0	1500	1615	0	1628	1575	0
Flt Permitted	0.694			0.679			0.231			0.136		
Satd. Flow (perm)	1172	1578	0	993	1564	0	365	1615	0	233	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		100			84			1			35	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	383	122	0	9	98	0	36	879	0	11	740	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.15	0.23		0.03	0.19		0.18	0.96		0.08	0.82	
Control Delay	123.0	7.6		18.6	7.4		8.2	34.6		8.9	21.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	123.0	7.6		18.6	7.4		8.2	34.6		8.9	21.5	
LOS	F	A		B	A		A	C		A	C	
Approach Delay		95.1			8.4			33.6			21.3	
Approach LOS		F			A			C			C	
Queue Length 50th (ft)	~198	7		3	4		4	338		2	224	
Queue Length 95th (ft)	#354	42		13	36		m10	#592		9	#455	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	334	522		283	506		205	911		131	904	
Starvation Cap Reductn	0	0		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	1.15	0.23		0.03	0.19		0.18	0.96		0.08	0.82	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 42.0

Intersection LOS: D

Intersection Capacity Utilization 79.6%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

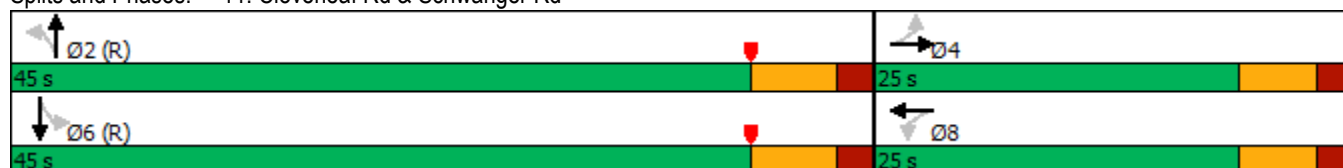
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2029 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	345	20	90	8	13	76	32	783	8	10	513	153
Future Volume (veh/h)	345	20	90	8	13	76	32	783	8	10	513	153
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	383	22	100	9	14	84	36	870	9	11	570	170
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	420	93	421	350	60	361	268	994	10	474	754	225
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1356	324	1473	1062	210	1263	691	1762	18	658	1336	399
Grp Volume(v), veh/h	383	0	122	9	0	98	36	0	879	11	0	740
Grp Sat Flow(s),veh/h/ln	1356	0	1797	1062	0	1473	691	0	1781	658	0	1735
Q Serve(g_s), s	16.4	0.0	3.7	0.5	0.0	3.6	2.3	0.0	0.0	0.5	0.0	22.8
Cycle Q Clear(g_c), s	20.0	0.0	3.7	4.1	0.0	3.6	25.1	0.0	0.0	0.5	0.0	22.8
Prop In Lane	1.00		0.82	1.00		0.86	1.00		0.01	1.00		0.23
Lane Grp Cap(c), veh/h	420	0	514	350	0	421	268	0	1005	474	0	979
V/C Ratio(X)	0.91	0.00	0.24	0.03	0.00	0.23	0.13	0.00	0.87	0.02	0.00	0.76
Avail Cap(c_a), veh/h	420	0	514	350	0	421	268	0	1005	474	0	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.73	0.00	0.73	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	19.5	20.8	0.0	19.5	7.2	0.0	0.0	6.8	0.0	11.7
Incr Delay (d2), s/veh	23.7	0.0	0.2	0.0	0.0	0.3	0.8	0.0	8.0	0.1	0.0	5.4
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(95%),veh/ln	13.9	0.0	2.6	0.2	0.0	2.1	0.5	0.0	4.0	0.1	0.0	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	0.0	19.7	20.8	0.0	19.8	8.0	0.0	8.0	6.8	0.0	17.1
LnGrp LOS	D	A	B	C	A	B	A	A	A	A	A	B
Approach Vol, veh/h	505			107			915			751		
Approach Delay, s/veh	44.2			19.8			8.0			17.0		
Approach LOS	D			B			A			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			24.8			6.1		
Green Ext Time (p_c), s	28.4			0.0			10.9			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	19.5											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	9	2	787	7	25	564	7
Future Volume (vph)	36	0	17	17	1	9	2	787	7	25	564	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1686	0	0	1561	0	0	1615	1648
Flt Permitted		0.739			0.783			0.999			0.955	
Satd. Flow (perm)	0	1286	1581	0	1362	0	0	1559	0	0	1545	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		9			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	28	0	0	829	0	0	614	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.6			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.24	0.08		0.16			0.64			0.48	0.01
Control Delay		30.5	2.8		22.5			7.7			8.3	0.4
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		30.5	2.8		22.5			7.7			8.3	0.4
LOS		C	A		C			A			A	A
Approach Delay		21.6			22.5			7.7			8.2	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		15	0		7			148			173	0
Queue Length 95th (ft)		40	5		28			338			m261	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		229	320		250			1300			1288	1380
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		0.17	0.06		0.11			0.64			0.48	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 69.7%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

											
Ø2 (R)									Ø4		
53 s									17 s		
											
Ø6 (R)									Ø8		
53 s									17 s		

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	9	2	787	7	25	564	7
Future Volume (veh/h)	36	0	17	17	1	9	2	787	7	25	564	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	9	2	820	7	26	588	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	208	0	104	120	9	21	52	1294	11	79	1325	1319
Arrive On Green	0.05	0.00	0.07	0.05	0.07	0.05	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1599	0	1586	549	133	323	1	1620	14	31	1659	1652
Grp Volume(v), veh/h	38	0	18	28	0	0	829	0	0	614	0	7
Grp Sat Flow(s),veh/h/ln	1599	0	1586	1004	0	0	1634	0	0	1690	0	1652
Q Serve(g_s), s	0.0	0.0	0.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.8	2.4	0.0	0.0	14.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.64		0.32	0.00		0.01	0.04		1.00
Lane Grp Cap(c), veh/h	185	0	104	136	0	0	1333	0	0	1379	0	1319
V/C Ratio(X)	0.21	0.00	0.17	0.21	0.00	0.00	0.62	0.00	0.00	0.45	0.00	0.01
Avail Cap(c_a), veh/h	338	0	283	302	0	0	1333	0	0	1379	0	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.48	0.00	0.48
Uniform Delay (d), s/veh	31.7	0.0	30.9	32.4	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	0.7	0.0	0.0	2.2	0.0	0.0	0.5	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(95%),veh/ln	1.2	0.0	0.5	0.9	0.0	0.0	4.0	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	0.0	31.7	33.1	0.0	0.0	5.1	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56			28			829			621		
Approach Delay, s/veh	32.1			33.1			5.1			0.5		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	60.9			9.1			60.9			9.1		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	47.0			11.5			47.0			11.5		
Max Q Clear Time (g_c+I1), s	16.8			3.5			2.0			4.4		
Green Ext Time (p_c), s	22.5			0.1			21.6			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	4.7											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	195	38	3	178	204	74	370	11	109	232	212
Future Volume (vph)	270	195	38	3	178	204	74	370	11	109	232	212
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1718	0	1500	1509	1388
Flt Permitted	0.418			0.628			0.534			0.274		
Satd. Flow (perm)	653	1660	1088	788	1649	1561	920	1718	0	432	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		2				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	207	40	3	189	217	79	406	0	116	247	226
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	29.8	29.8	29.8	14.5	14.5	14.5	26.3	20.3		26.4	20.4	20.4
Actuated g/C Ratio	0.41	0.41	0.41	0.20	0.20	0.20	0.36	0.28		0.36	0.28	0.28
v/c Ratio	0.76	0.30	0.07	0.02	0.57	0.43	0.19	0.84		0.42	0.58	0.41
Control Delay	33.3	17.5	0.3	25.0	35.5	6.0	13.6	43.4		17.8	30.2	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	33.3	17.5	0.3	25.0	35.5	6.0	13.6	43.4		17.8	30.2	5.8
LOS	C	B	A	C	D	A	B	D		B	C	A
Approach Delay		24.7			19.8			38.6			18.4	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	101	67	0	1	83	0	19	175		29	97	0
Queue Length 95th (ft)	#211	117	0	8	147	43	47	#354		66	184	48

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	380	770	585	199	417	573	415	520		278	457	582
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.76	0.27	0.07	0.02	0.45	0.38	0.19	0.78		0.42	0.54	0.39

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.4

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 25.2

Intersection LOS: C

Intersection Capacity Utilization 72.6%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	195	38	3	178	204	74	370	11	109	232	212
Future Volume (veh/h)	270	195	38	3	178	204	74	370	11	109	232	212
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	287	207	27	3	189	0	79	394	10	116	247	196
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	430	696	491	259	327		375	487	12	305	417	369
Arrive On Green	0.14	0.41	0.41	0.19	0.19	0.00	0.07	0.24	0.23	0.10	0.27	0.27
Sat Flow, veh/h	1641	1709	1206	814	1724	1532	1988	2007	51	1522	1528	1352
Grp Volume(v), veh/h	287	207	27	3	189	0	79	0	404	116	247	196
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	814	1724	1532	1988	0	2058	1522	1528	1352
Q Serve(g_s), s	9.3	5.6	0.9	0.2	6.9	0.0	2.0	0.0	12.7	3.8	9.7	8.5
Cycle Q Clear(g_c), s	9.3	5.6	0.9	0.2	6.9	0.0	2.0	0.0	12.7	3.8	9.7	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	430	696	491	259	327		375	0	500	305	417	369
V/C Ratio(X)	0.67	0.30	0.05	0.01	0.58		0.21	0.00	0.81	0.38	0.59	0.53
Avail Cap(c_a), veh/h	430	819	578	317	450		475	0	642	336	477	422
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	13.8	12.4	22.7	25.4	0.0	17.6	0.0	24.6	17.6	21.7	21.3
Incr Delay (d2), s/veh	3.9	0.1	0.0	0.0	0.6	0.0	0.3	0.0	6.0	0.8	1.5	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(95%),veh/ln	6.2	3.3	0.4	0.1	4.7	0.0	1.6	0.0	11.0	2.2	5.9	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	13.9	12.4	22.7	26.0	0.0	17.9	0.0	30.6	18.4	23.2	22.5
LnGrp LOS	C	B	B	C	C		B	A	C	B	C	C
Approach Vol, veh/h	521			192			483			559		
Approach Delay, s/veh	18.1			26.0			28.5			22.0		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	12.6	22.7		33.6	10.5	24.8				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	11.8	9.4	6.3	14.7		8.1	4.5	12.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0		0.1	0.0	1.5				
Intersection Summary												
HCM 6th Ctrl Delay	23.0											
HCM 6th LOS	C											
Notes												

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2029 No Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	288	387	24	26	3
Future Volume (vph)	3	288	387	24	26	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1723	0	1554	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1723	0	1554	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	316	451	0	32	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 31.8% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	288	387	24	26	3
Future Vol, veh/h	3	288	387	24	26	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	316	425	26	29	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	451	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.4	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.3	-	-
Pot Cap-1 Maneuver	768	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	768	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.4
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	768	-	-	-	520
HCM Lane V/C Ratio	0.004	-	-	-	0.061
HCM Control Delay (s)	9.7	-	-	-	12.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2029 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	23	34	6	44	114	47	311	9	26	171	74
Future Volume (vph)	64	23	34	6	44	114	47	311	9	26	171	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1307	0	0	1540	0	0	1664	0	0	1508	0
Flt Permitted		0.974			0.998			0.994			0.995	
Satd. Flow (perm)	0	1307	0	0	1540	0	0	1664	0	0	1508	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	126	0	0	171	0	0	382	0	0	282	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	54.7%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	64	23	34	6	44	114	47	311	9	26	171	74
Future Vol, veh/h	64	23	34	6	44	114	47	311	9	26	171	74
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	67	24	35	6	46	119	49	324	9	27	178	77
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.2	10.8	16.6	13.9
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	53%	4%	10%
Vol Thru, %	85%	19%	27%	63%
Vol Right, %	2%	28%	70%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	367	121	164	271
LT Vol	47	64	6	26
Through Vol	311	23	44	171
RT Vol	9	34	114	74
Lane Flow Rate	382	126	171	282
Geometry Grp	1	1	1	1
Degree of Util (X)	0.595	0.241	0.269	0.46
Departure Headway (Hd)	5.601	6.89	5.663	5.866
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	642	518	630	613
Service Time	3.656	4.967	3.735	3.925
HCM Lane V/C Ratio	0.595	0.243	0.271	0.46
HCM Control Delay	16.6	12.2	10.8	13.9
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	3.9	0.9	1.1	2.4

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 No Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	670	88	197	502	126	128
Future Volume (vph)	670	88	197	502	126	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1799	0	1744	1958	1583	0
Flt Permitted			0.096		0.976	
Satd. Flow (perm)	1799	0	176	1958	1583	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	12					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	833	0	216	552	279	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	0.90		0.79	0.43	0.84	
Control Delay	33.0		29.7	7.5	54.3	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	33.0		29.7	7.5	54.3	
LOS	C		C	A	D	
Approach Delay	33.0			13.7	54.3	
Approach LOS	C			B	D	
Queue Length 50th (ft)	352		40	124	135	
Queue Length 95th (ft)	#606		m#87	m154	#265	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	923		275	1292	332	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.90		0.79	0.43	0.84	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 82.0%	ICU Level of Service E
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	46 s	22 s
↖ Ø6 (R)		
58 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2029 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	670	88	197	502	126	128
Future Volume (veh/h)	670	88	197	502	126	128
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	736	88	216	552	138	141
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	811	97	321	1397	166	169
Arrive On Green	0.53	0.52	0.17	1.00	0.20	0.19
Sat Flow, veh/h	1521	182	1914	2090	822	840
Grp Volume(v), veh/h	0	824	216	552	280	0
Grp Sat Flow(s),veh/h/ln	0	1702	1914	2090	1668	0
Q Serve(g_s), s	0.0	35.0	3.8	0.0	12.9	0.0
Cycle Q Clear(g_c), s	0.0	35.0	3.8	0.0	12.9	0.0
Prop In Lane		0.11	1.00		0.49	0.50
Lane Grp Cap(c), veh/h	0	908	321	1397	336	0
V/C Ratio(X)	0.00	0.91	0.67	0.40	0.83	0.00
Avail Cap(c_a), veh/h	0	908	350	1397	350	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	16.9	15.3	0.0	30.9	0.0
Incr Delay (d2), s/veh	0.0	14.4	4.5	0.8	19.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	21.7	4.0	0.6	11.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	31.3	19.8	0.8	50.4	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	824			768	280	
Approach Delay, s/veh	31.3			6.2	50.4	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.8	47.9		21.3		58.7
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	5.8	37.0		14.9		2.0
Green Ext Time (p_c), s	0.1	2.4		0.2		17.2
Intersection Summary						
HCM 6th Ctrl Delay			23.8			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	832	0	0	980	87	1	0	2	30	0	49
Future Volume (vph)	28	832	0	0	980	87	1	0	2	30	0	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	895	0	0	1148	0	0	3	0	32	53	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 68.0% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	832	0	0	980	87	1	0	2	30	0	49
Future Vol, veh/h	28	832	0	0	980	87	1	0	2	30	0	49
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	30	895	0	0	1054	94	1	0	2	32	0	53

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1148	0	0	895	0	0	2084	2103	895	2057	2056	1102
Stage 1	-	-	-	-	-	-	955	955	-	1101	1101	-
Stage 2	-	-	-	-	-	-	1129	1148	-	956	955	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	573	-	-	434	-	-	52	66	375	61	79	295
Stage 1	-	-	-	-	-	-	384	377	-	341	349	-
Stage 2	-	-	-	-	-	-	310	313	-	404	398	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	573	-	-	434	-	-	41	63	375	58	75	295
Mov Cap-2 Maneuver	-	-	-	-	-	-	41	63	-	58	75	-
Stage 1	-	-	-	-	-	-	364	357	-	323	349	-
Stage 2	-	-	-	-	-	-	254	313	-	381	377	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	41.8	60.5
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	101	573	-	-	434	-	-	58	295
HCM Lane V/C Ratio	0.032	0.053	-	-	-	-	-	0.556	0.179
HCM Control Delay (s)	41.8	11.6	-	-	0	-	-	126.9	19.8
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	2.2	0.6

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	630	38	155	772	18	275	3	119	24	8	17
Future Volume (vph)	15	630	38	155	772	18	275	3	119	24	8	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1742	0
Flt Permitted	0.310			0.187			0.740			0.676		
Satd. Flow (perm)	539	1766	1550	309	1697	1608	1314	1576	0	1253	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40			124			18
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	656	40	161	804	19	286	127	0	25	26	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.5	37.5	37.5	51.6	50.3	50.3	19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.64	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.06	0.79	0.05	0.49	0.75	0.02	0.92	0.27		0.08	0.06	
Control Delay	11.7	18.0	0.2	10.1	7.3	0.1	66.4	7.1		24.7	14.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.7	18.0	0.2	10.1	7.3	0.1	66.4	7.1		24.7	14.0	
LOS	B	B	A	B	A	A	E	A		C	B	
Approach Delay		16.9			7.6			48.2			19.2	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	3	124	0	4	26	0	140	1		10	3	
Queue Length 95th (ft)	m5	m183	m0	m34	62	m0	#284	42		29	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	252	828	787	333	1066	1025	313	470		299	429	
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	0.06	0.79	0.05	0.48	0.75	0.02	0.91	0.27		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 18.7

Intersection LOS: B

Intersection Capacity Utilization 91.9%

ICU Level of Service F

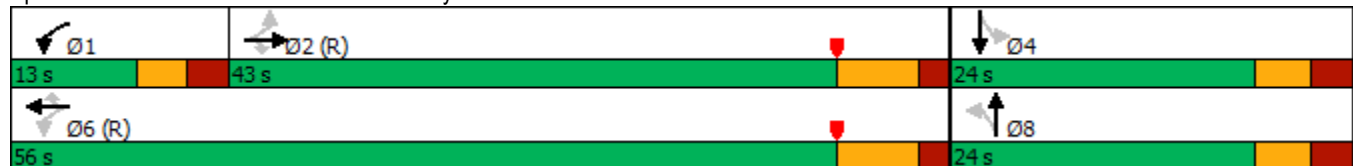
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	630	38	155	772	18	275	3	119	24	8	17
Future Volume (veh/h)	15	630	38	155	772	18	275	3	119	24	8	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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	16	656	25	161	804	16	286	3	84	25	8	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	451	997	856	569	1097	975	429	14	381	370	153	287
Arrive On Green	0.98	0.98	0.98	0.17	1.00	1.00	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	735	2032	1745	1666	1736	1542	1468	58	1627	1413	653	1224
Grp Volume(v), veh/h	16	656	25	161	804	16	286	0	87	25	0	23
Grp Sat Flow(s),veh/h/ln	735	2032	1745	1666	1736	1542	1468	0	1685	1413	0	1878
Q Serve(g_s), s	0.0	1.3	0.0	3.4	0.0	0.0	14.9	0.0	3.4	1.2	0.0	0.8
Cycle Q Clear(g_c), s	0.0	1.3	0.0	3.4	0.0	0.0	15.2	0.0	3.4	4.0	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.65
Lane Grp Cap(c), veh/h	451	997	856	569	1097	975	429	0	394	370	0	439
V/C Ratio(X)	0.04	0.66	0.03	0.28	0.73	0.02	0.67	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	451	997	856	604	1097	975	436	0	402	376	0	448
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)	1.00	1.00	1.00	0.71	0.71	0.71	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.4	0.4	0.4	6.3	0.0	0.0	29.4	0.0	25.2	26.2	0.0	24.0
Incr Delay (d2), s/veh	0.1	3.4	0.1	0.2	3.1	0.0	3.8	0.0	0.3	0.1	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(95%),veh/ln	0.0	2.0	0.0	1.6	1.7	0.0	9.4	0.0	2.5	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	3.8	0.4	6.5	3.1	0.0	33.2	0.0	25.4	26.3	0.0	24.1
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	697			981			373			48		
Approach Delay, s/veh	3.6			3.6			31.4			25.2		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	11.3	45.1	23.6			56.4	23.6					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2	* 18					
Max Q Clear Time (g_c+I1), s	5.9	3.8	6.5			2.5	17.7					
Green Ext Time (p_c), s	0.1	0.8	0.1			1.0	0.1					

Intersection Summary

HCM 6th Ctrl Delay	9.0
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	454	1	10	777	75	9	2	1	43	3	115
Future Volume (vph)	87	454	1	10	777	75	9	2	1	43	3	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.216			0.490				0.712		0.750		
Satd. Flow (perm)	381	1729	0	818	1818	1561	0	1347	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			121	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	479	0	11	818	79	0	12	0	45	124	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.9	64.1		55.3	55.3	55.3		9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.22	0.35		0.02	0.65	0.07		0.08		0.29	0.44	
Control Delay	3.6	6.0		4.7	11.7	0.6		29.9		36.2	12.1	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0		0.0	0.0	
Total Delay	3.6	6.0		4.7	11.9	0.6		29.9		36.2	12.1	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		5.6			10.8			29.9			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	10	131		1	310	0		5		21	1	
Queue Length 95th (ft)	m17	m207		m2	407	m1		19		50	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	409	1384		565	1255	1112		226		227	352	
Starvation Cap Reductn	0	0		0	41	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	0.22	0.35		0.02	0.67	0.07		0.05		0.20	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 9.9

Intersection LOS: A

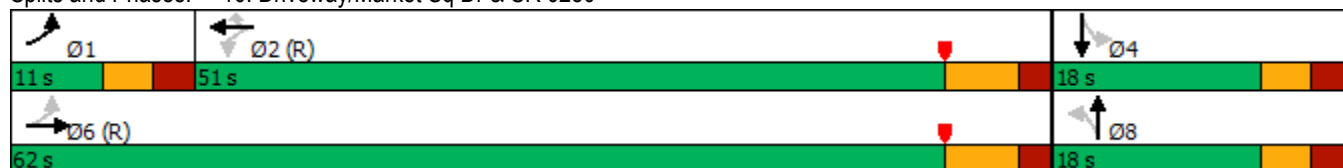
Intersection Capacity Utilization 68.2%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2029 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	454	1	10	777	75	9	2	1	43	3	115
Future Volume (veh/h)	87	454	1	10	777	75	9	2	1	43	3	115
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	92	478	1	11	818	70	9	2	0	45	3	65
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	569	1338	3	699	1333	1138	113	19	0	210	5	115
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.07	0.08	0.00	0.08	0.08	0.07
Sat Flow, veh/h	1629	1678	4	885	1935	1652	396	245	0	1376	68	1476
Grp Volume(v), veh/h	92	0	479	11	818	70	11	0	0	45	0	68
Grp Sat Flow(s),veh/h/ln	1629	0	1682	885	1935	1652	641	0	0	1376	0	1544
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	2.0	0.0	3.4
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.96
Lane Grp Cap(c), veh/h	569	0	1341	699	1333	1138	124	0	0	210	0	120
V/C Ratio(X)	0.16	0.00	0.36	0.02	0.61	0.06	0.09	0.00	0.00	0.21	0.00	0.57
Avail Cap(c_a), veh/h	617	0	1341	699	1333	1138	249	0	0	334	0	259
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)	0.55	0.00	0.55	0.74	0.74	0.74	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.7	0.0	0.0	34.9	0.0	36.0
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.6	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.0	0.0	0.4	0.0	0.0	1.5	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.0	0.4	0.0	1.6	0.1	35.0	0.0	0.0	35.4	0.0	40.2
LnGrp LOS	A	A	A	A	A	A	C	A	A	D	A	D
Approach Vol, veh/h	571			899			11			113		
Approach Delay, s/veh	0.7			1.4			35.0			38.3		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.7	60.5		10.8		69.2		10.8				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.6	2.5		5.4		2.5		5.4				
Green Ext Time (p_c), s	0.0	1.1		0.2		0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				4.0								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	401	22	42	663	33	94	36	30	34	45	96
Future Volume (vph)	63	401	22	42	663	33	94	36	30	34	45	96
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1708	0	1573	1677	0	1572	1603	0	0	1801	0
Flt Permitted	0.307			0.478			0.514				0.921	
Satd. Flow (perm)	534	1708	0	791	1677	0	850	1603	0	0	1675	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			5			32			83	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	445	0	44	733	0	99	70	0	0	184	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	56.0	56.0		56.0	56.0		14.1	14.1			14.1	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.18	0.18			0.18	
v/c Ratio	0.18	0.37		0.08	0.62		0.66	0.23			0.51	
Control Delay	1.7	1.5		5.6	10.5		50.5	17.8			20.4	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0			0.0	
Total Delay	1.7	1.5		5.6	10.6		50.5	17.8			20.4	
LOS	A	A		A	B		D	B			C	
Approach Delay		1.5			10.3			37.0			20.4	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	1	8		6	161		47	16			45	
Queue Length 95th (ft)	3	9		21	353		89	45			94	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	373	1197		553	1175		286	562			620	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	38		0	0			1	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.18	0.37		0.08	0.64		0.35	0.12			0.30	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.5

Intersection LOS: B

Intersection Capacity Utilization 83.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)	 Ø4
48 s	32 s
 Ø6 (R)	 Ø8
48 s	32 s

HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2029 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	401	22	42	663	33	94	36	30	34	45	96
Future Volume (veh/h)	63	401	22	42	663	33	94	36	30	34	45	96
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	66	422	22	44	698	33	99	38	14	36	47	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	471	1187	62	787	1327	63	235	164	60	93	84	118
Arrive On Green	1.00	1.00	1.00	0.74	0.74	0.73	0.14	0.14	0.13	0.13	0.14	0.13
Sat Flow, veh/h	667	1609	84	945	1797	85	1180	1189	438	272	611	851
Grp Volume(v), veh/h	66	0	444	44	0	731	99	0	52	163	0	0
Grp Sat Flow(s),veh/h/ln	667	0	1692	945	0	1882	1180	0	1627	1735	0	0
Q Serve(g_s), s	2.1	0.0	0.0	1.0	0.0	13.3	0.4	0.0	2.3	4.4	0.0	0.0
Cycle Q Clear(g_c), s	15.4	0.0	0.0	1.0	0.0	13.3	7.6	0.0	2.3	7.2	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.27	0.22		0.49
Lane Grp Cap(c), veh/h	471	0	1249	787	0	1389	235	0	225	273	0	0
V/C Ratio(X)	0.14	0.00	0.36	0.06	0.00	0.53	0.42	0.00	0.23	0.60	0.00	0.00
Avail Cap(c_a), veh/h	471	0	1249	787	0	1389	471	0	549	611	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(l)	0.95	0.00	0.95	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.7	0.0	0.0	2.9	0.0	4.5	33.0	0.0	30.8	33.1	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.8	0.1	0.0	1.4	1.2	0.0	0.5	2.1	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(95%),veh/ln	0.2	0.0	0.5	0.3	0.0	6.4	3.3	0.0	1.6	5.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.3	0.0	0.8	3.0	0.0	5.9	34.2	0.0	31.3	35.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	510			775			151			163		
Approach Delay, s/veh	1.0			5.8			33.2			35.2		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	64.0			16.0			64.0			16.0		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			9.2			15.3			9.6		
Green Ext Time (p_c), s	13.0			0.5			18.7			0.4		

Intersection Summary

HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Notes

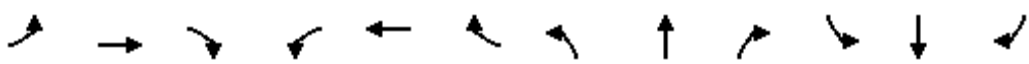
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	579	0	125	281	146	0	0	231	48
Future Volume (vph)	0	0	0	579	0	125	281	146	0	0	231	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.392					
Satd. Flow (perm)	0	0	0	0	1653	1414	656	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	609	132	296	154	0	0	243	51
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.1	25.1	28.9	28.9			15.9	15.9
Actuated g/C Ratio					0.40	0.40	0.46	0.46			0.25	0.25
v/c Ratio					0.93	0.20	0.71	0.22			0.59	0.10
Control Delay					44.0	3.0	23.8	11.6			27.5	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					44.0	3.0	23.8	11.6			27.5	0.4
LOS					D	A	C	B			C	A
Approach Delay					36.7			19.6			22.8	
Approach LOS					D			B			C	
Queue Length 50th (ft)					225	0	74	35			83	0
Queue Length 95th (ft)					#420	24	#149	68			149	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					664	658	416	714			444	543
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					0.92	0.20	0.71	0.22			0.55	0.09

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 63.5

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 28.8

Intersection LOS: C

Intersection Capacity Utilization 124.6%

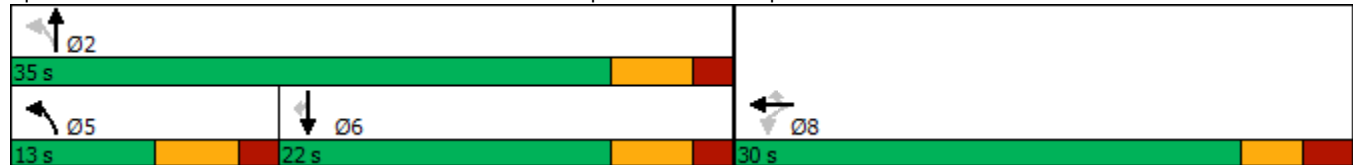
ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 No Build
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶	↷			↷	↶
Traffic Volume (veh/h)	0	0	0	579	0	125	281	146	0	0	231	48
Future Volume (veh/h)	0	0	0	579	0	125	281	146	0	0	231	48
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				609	0	0	296	154	0	0	243	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				699	0		457	705	0	0	399	
Arrive On Green				0.37	0.00	0.00	0.14	0.45	0.00	0.00	0.22	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				609	0	0	296	154	0	0	243	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				18.5	0.0	0.0	7.7	3.5	0.0	0.0	7.1	0.0
Cycle Q Clear(g_c), s				18.5	0.0	0.0	7.7	3.5	0.0	0.0	7.1	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				699	0		457	705	0	0	399	
V/C Ratio(X)				0.87	0.00		0.65	0.22	0.00	0.00	0.61	
Avail Cap(c_a), veh/h				781	0		457	813	0	0	522	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.9	0.0	0.0	14.0	9.9	0.0	0.0	20.4	0.0
Incr Delay (d2), s/veh				9.8	0.0	0.0	3.2	0.6	0.0	0.0	5.4	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
%ile BackOfQ(95%),veh/ln				13.6	0.0	0.0	4.9	1.9	0.0	0.0	5.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				26.7	0.0	0.0	17.2	10.5	0.0	0.0	25.7	0.0
LnGrp LOS				C	A		B	B	A	A	C	
Approach Vol, veh/h					609			450			243	
Approach Delay, s/veh					26.7			14.9			25.7	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		27.3				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		24.5				
Max Q Clear Time (g_c+I1), s		5.5			9.7	9.1		20.5				
Green Ext Time (p_c), s		3.0			0.0	2.1		1.3				
Intersection Summary												
HCM 6th Ctrl Delay				22.5								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	3	508	0	0	0	0	387	444	100	718	0
Future Volume (vph)	44	3	508	0	0	0	0	387	444	100	718	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1563	1569	0	0	0	0	1665	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1563	1569	0	0	0	0	1665	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	524	0	0	0	0	857	0	103	740	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	124.6%						ICU Level of Service H					
Analysis Period (min)	15											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2029 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh	26.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	44	3	508	0	0	0	0	387	444	100	718	0
Future Vol, veh/h	44	3	508	0	0	0	0	387	444	100	718	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	45	3	524	0	0	0	0	399	458	103	740	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1345	1345	740	-	0	0	399	0	0
Stage 1	946	946	-	-	-	-	-	-	-
Stage 2	399	399	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	158	191	~ 466	0	-	-	881	-	0
Stage 1	448	401	-	0	-	-	-	-	0
Stage 2	769	647	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	140	0	~ 466	-	-	-	881	-	-
Mov Cap-2 Maneuver	140	0	-	-	-	-	-	-	-
Stage 1	448	0	-	-	-	-	-	-	-
Stage 2	679	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	103.5	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	140	466	881	-
HCM Lane V/C Ratio	-	-	0.346	1.124	0.117	-
HCM Control Delay (s)	-	-	43.7	109	9.6	-
HCM Lane LOS	-	-	E	F	A	-
HCM 95th %tile Q(veh)	-	-	1.4	18.1	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 No Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	816	1198	10
Future Volume (vph)	3	9	8	816	1198	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1801	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	849	1245	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	73.7%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 No Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	816	1198	10
Future Vol, veh/h	3	9	8	816	1198	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	841	1235	10

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2097	1240	1245	0	-	0
Stage 1	1240	-	-	-	-	-
Stage 2	857	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	61	223	501	-	-	-
Stage 1	300	-	-	-	-	-
Stage 2	464	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	59	223	501	-	-	-
Mov Cap-2 Maneuver	59	-	-	-	-	-
Stage 1	291	-	-	-	-	-
Stage 2	464	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	35.1	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	501	-	132	-	-
HCM Lane V/C Ratio	0.016	-	0.094	-	-
HCM Control Delay (s)	12.3	0	35.1	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	34	79	9	42	36	60	570	14	50	834	327
Future Volume (vph)	224	34	79	9	42	36	60	570	14	50	834	327
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1683	0	1416	1704	0	1620	1693	0	1628	1672	0
Flt Permitted	0.704			0.681			0.107			0.361		
Satd. Flow (perm)	1200	1683	0	1015	1704	0	182	1693	0	619	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		83			38			4			63	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	236	119	0	9	82	0	63	615	0	53	1222	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	0.98	0.30		0.04	0.22		0.56	0.58		0.14	1.14	
Control Delay	83.8	10.9		20.2	14.4		32.2	13.1		5.7	92.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	83.8	10.9		20.2	14.4		32.2	13.1		5.7	92.0	
LOS	F	B		C	B		C	B		A	F	
Approach Delay		59.4			14.9			14.9			88.4	
Approach LOS		E			B			B			F	
Queue Length 50th (ft)	86	11		3	13		26	253		7	~530	
Queue Length 95th (ft)	#209	48		13	44		m#43	300		19	#754	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	403		203	371		113	1059		386	1068	
Starvation Cap Reductn	0	0		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	0.98	0.30		0.04	0.22		0.56	0.58		0.14	1.14	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 60.5

Intersection LOS: E

Intersection Capacity Utilization 95.9%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary
11: Cloverleaf Rd & Schwanger Rd

2029 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	34	79	9	42	36	60	570	14	50	834	327
Future Volume (veh/h)	224	34	79	9	42	36	60	570	14	50	834	327
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	236	36	59	9	44	24	63	600	14	53	878	333
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	354	141	231	294	221	121	120	1128	26	397	829	315
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1406	704	1154	1110	1107	604	472	1805	42	842	1327	503
Grp Volume(v), veh/h	236	0	95	9	0	68	63	0	614	53	0	1211
Grp Sat Flow(s),veh/h/ln	1406	0	1858	1110	0	1711	472	0	1847	842	0	1830
Q Serve(g_s), s	10.0	0.0	2.6	0.4	0.0	2.0	0.0	0.0	17.8	2.7	0.0	37.5
Cycle Q Clear(g_c), s	12.0	0.0	2.6	3.0	0.0	2.0	37.5	0.0	17.8	20.5	0.0	37.5
Prop In Lane	1.00		0.62	1.00		0.35	1.00		0.02	1.00		0.27
Lane Grp Cap(c), veh/h	354	0	372	294	0	342	120	0	1155	397	0	1144
V/C Ratio(X)	0.67	0.00	0.26	0.03	0.00	0.20	0.52	0.00	0.53	0.13	0.00	1.06
Avail Cap(c_a), veh/h	354	0	372	294	0	342	120	0	1155	397	0	1144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.83	0.00	0.83	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.0	0.0	20.5	21.5	0.0	20.1	42.6	0.0	16.0	14.4	0.0	11.4
Incr Delay (d2), s/veh	4.7	0.0	0.4	0.0	0.0	0.3	13.0	0.0	1.5	0.7	0.0	43.6
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(95%),veh/ln	6.3	0.0	1.9	0.2	0.0	1.4	2.5	0.0	13.2	0.9	0.0	32.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	0.0	20.9	21.6	0.0	20.4	55.5	0.0	17.4	15.1	0.0	55.0
LnGrp LOS	C	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	331			77			677			1264		
Approach Delay, s/veh	27.2			20.6			21.0			53.4		
Approach LOS	C			C			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	19.8			14.0			39.5			5.0		
Green Ext Time (p_c), s	10.9			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	39.3											
HCM 6th LOS	D											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	63	0	40	17	590	5	10	877	35
Future Volume (vph)	15	0	18	63	0	40	17	590	5	10	877	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1670	0	0	1640	0	0	1722	1648
Flt Permitted		0.762			0.804			0.970			0.993	
Satd. Flow (perm)	0	1326	1581	0	1384	0	0	1592	0	0	1711	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	108	0	0	644	0	0	934	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.7			45.0			45.0	45.0
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.08	0.07		0.44			0.54			0.73	0.03
Control Delay		22.1	1.7		18.8			8.3			3.9	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		22.1	1.7		18.8			8.3			3.9	0.1
LOS		C	A		B			A			A	A
Approach Delay		11.0			18.8			8.3			3.7	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		17			232			22	0
Queue Length 95th (ft)		19	4		55			204			m29	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		232	322		287			1195			1284	1248
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		0.07	0.06		0.38			0.54			0.73	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 6.5

Intersection LOS: A

Intersection Capacity Utilization 74.2%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	63	0	40	17	590	5	10	877	35
Future Volume (veh/h)	15	0	18	63	0	40	17	590	5	10	877	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	66	0	27	18	621	5	11	923	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	290	0	168	201	4	42	74	1206	10	65	1349	1216
Arrive On Green	0.09	0.00	0.11	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1607	0	1586	931	33	395	17	1638	13	6	1832	1652
Grp Volume(v), veh/h	16	0	11	93	0	0	644	0	0	934	0	36
Grp Sat Flow(s),veh/h/ln	1607	0	1586	1360	0	0	1668	0	0	1838	0	1652
Q Serve(g_s), s	0.0	0.0	0.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.4	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.71		0.29	0.03		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	263	0	168	223	0	0	1262	0	0	1383	0	1216
V/C Ratio(X)	0.06	0.00	0.07	0.42	0.00	0.00	0.51	0.00	0.00	0.68	0.00	0.03
Avail Cap(c_a), veh/h	355	0	278	324	0	0	1262	0	0	1383	0	1216
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	24.7	0.0	24.2	26.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.2	0.0	0.0	1.5	0.0	0.0	0.2	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(95%),veh/ln	0.4	0.0	0.3	2.4	0.0	0.0	0.9	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	24.3	27.7	0.0	0.0	1.5	0.0	0.0	0.2	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	27			93			644			970		
Approach Delay, s/veh	24.6			27.7			1.5			0.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.2			10.8			49.2			10.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.5			2.0			6.1		
Green Ext Time (p_c), s	20.2			0.0			29.7			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	291	60	23	307	136	96	287	18	223	358	296
Future Volume (vph)	222	291	60	23	307	136	96	287	18	223	358	296
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1810	0	1604	1640	1442
Flt Permitted	0.219			0.577			0.425			0.369		
Satd. Flow (perm)	366	1791	1435	919	1697	1577	681	1810	0	623	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		2				305
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	229	300	62	24	316	140	99	315	0	230	369	305
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	49.0	49.0	49.0	26.8	26.8	26.8	48.6	39.9		58.3	44.8	44.8
Actuated g/C Ratio	0.41	0.41	0.41	0.22	0.22	0.22	0.40	0.33		0.49	0.37	0.37
v/c Ratio	0.72	0.41	0.10	0.12	0.83	0.29	0.29	0.52		0.56	0.60	0.42
Control Delay	36.4	25.9	1.2	35.3	62.7	5.1	21.6	38.3		19.7	30.3	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	36.4	25.9	1.2	35.3	62.7	5.1	21.6	38.3		19.7	30.3	6.8
LOS	D	C	A	D	E	A	C	D		B	C	A
Approach Delay		27.4			44.5			34.3			19.6	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	119	161	0	15	235	0	41	198		100	179	38
Queue Length 95th (ft)	160	205	8	36	312	36	85	326		m157	#380	78
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	327	932	795	302	558	625	340	603		419	612	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.70	0.32	0.08	0.08	0.57	0.22	0.29	0.52		0.55	0.60	0.42

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 29.1

Intersection LOS: C

Intersection Capacity Utilization 79.3%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4 (R)
23 s	45 s	20 s	32 s
 Ø6	 Ø7	 Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	291	60	23	307	136	96	287	18	223	358	296
Future Volume (veh/h)	222	291	60	23	307	136	96	287	18	223	358	296
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	229	300	32	24	316	0	99	296	18	230	369	234
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	315	690	589	256	359		409	728	44	492	689	584
Arrive On Green	0.13	0.38	0.38	0.20	0.20	0.00	0.06	0.36	0.35	0.15	0.55	0.55
Sat Flow, veh/h	1736	1823	1557	966	1766	1544	1880	2012	122	1616	1655	1402
Grp Volume(v), veh/h	229	300	32	24	316	0	99	0	314	230	369	234
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	966	1766	1544	1880	0	2134	1616	1655	1402
Q Serve(g_s), s	11.8	14.7	1.6	2.4	20.8	0.0	3.9	0.0	13.2	10.2	17.0	11.5
Cycle Q Clear(g_c), s	11.8	14.7	1.6	2.4	20.8	0.0	3.9	0.0	13.2	10.2	17.0	11.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	315	690	589	256	359		409	0	772	492	689	584
V/C Ratio(X)	0.73	0.44	0.05	0.09	0.88		0.24	0.00	0.41	0.47	0.54	0.40
Avail Cap(c_a), veh/h	344	950	811	378	581		438	0	772	496	689	584
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	27.8	23.7	39.0	46.4	0.0	21.7	0.0	28.7	18.2	19.4	18.2
Incr Delay (d2), s/veh	6.9	0.2	0.0	0.1	5.3	0.0	0.3	0.0	1.6	0.7	3.0	2.0
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(95%),veh/ln	9.1	10.3	1.0	1.0	14.4	0.0	3.2	0.0	11.6	6.3	10.1	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	27.9	23.7	39.1	51.7	0.0	22.0	0.0	30.3	18.9	22.4	20.3
LnGrp LOS	D	C	C	D	D		C	A	C	B	C	C
Approach Vol, veh/h	561				340				413			
Approach Delay, s/veh	32.0				50.8				28.3			
Approach LOS	C				D				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	21.0	29.9	19.7	49.4		50.9	13.2	55.9				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	14.3	23.3	12.7	15.2		17.2	6.4	19.5				
Green Ext Time (p_c), s	0.2	0.1	0.0	1.0		0.1	0.0	2.5				

Intersection Summary

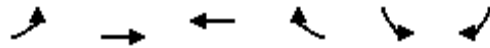
HCM 6th Ctrl Delay	29.9
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2029 No Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	489	420	57	39	1
Future Volume (vph)	6	489	420	57	39	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1763	0	1668	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1763	0	1668	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	509	497	0	42	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.7% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	489	420	57	39	1
Future Vol, veh/h	6	489	420	57	39	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	509	438	59	41	1
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	497	0	-	0	989	468
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	521	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	832	-	-	-	272	614
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	639	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	832	-	-	-	270	614
Mov Cap-2 Maneuver	-	-	-	-	423	-
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	639	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		14.4		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	832	-	-	-	426	
HCM Lane V/C Ratio	0.008	-	-	-	0.098	
HCM Control Delay (s)	9.4	-	-	-	14.4	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2029 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	83	78	4	52	56	33	265	6	87	319	48
Future Volume (vph)	79	83	78	4	52	56	33	265	6	87	319	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1396	0	0	1575	0	0	1668	0	0	1571	0
Flt Permitted		0.984			0.998			0.995			0.990	
Satd. Flow (perm)	0	1396	0	0	1575	0	0	1668	0	0	1571	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	249	0	0	116	0	0	316	0	0	473	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 67.0%	ICU Level of Service C											
Analysis Period (min) 15												

Intersection	
Intersection Delay, s/veh	25.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	79	83	78	4	52	56	33	265	6	87	319	48
Future Vol, veh/h	79	83	78	4	52	56	33	265	6	87	319	48
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	82	86	81	4	54	58	34	276	6	91	332	50
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.3	12.1	18.4	36.5
HCM LOS	C	B	C	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	33%	4%	19%
Vol Thru, %	87%	35%	46%	70%
Vol Right, %	2%	33%	50%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	304	240	112	454
LT Vol	33	79	4	87
Through Vol	265	83	52	319
RT Vol	6	78	56	48
Lane Flow Rate	317	250	117	473
Geometry Grp	1	1	1	1
Degree of Util (X)	0.579	0.517	0.226	0.853
Departure Headway (Hd)	6.587	7.446	6.983	6.49
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	548	483	511	558
Service Time	4.647	5.508	5.062	4.54
HCM Lane V/C Ratio	0.578	0.518	0.229	0.848
HCM Control Delay	18.4	18.3	12.1	36.5
HCM Lane LOS	C	C	B	E
HCM 95th-tile Q	3.7	2.9	0.9	9.1

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↱	↰	
Traffic Volume (vph)	629	84	133	535	91	128
Future Volume (vph)	629	84	133	535	91	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1835	0	1761	1958	1577	0
Flt Permitted			0.212		0.980	
Satd. Flow (perm)	1835	0	393	1958	1577	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	8					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	720	0	134	540	221	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	62.4		76.2	75.0	24.6	
Actuated g/C Ratio	0.57		0.69	0.68	0.22	
v/c Ratio	0.69		0.35	0.40	0.63	
Control Delay	22.5		7.6	8.7	45.9	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	22.5		7.6	8.7	45.9	
LOS	C		A	A	D	
Approach Delay	22.5			8.5	45.9	
Approach LOS	C			A	D	
Queue Length 50th (ft)	342		32	168	142	
Queue Length 95th (ft)	570		m48	m250	205	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1043		384	1335	570	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.69		0.35	0.40	0.39	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 19.9

Intersection LOS: B

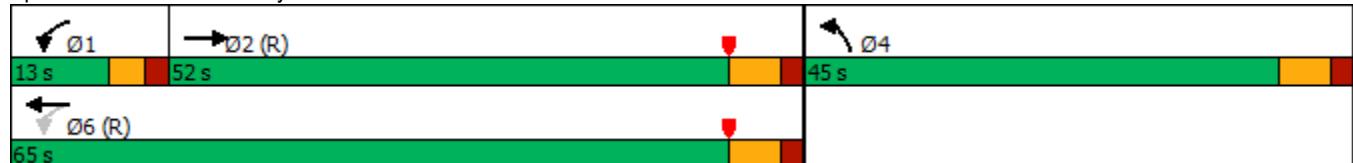
Intersection Capacity Utilization 73.7%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2029 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	629	84	133	535	91	128
Future Volume (veh/h)	629	84	133	535	91	128
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	635	83	134	540	92	129
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	979	128	474	1526	121	170
Arrive On Green	0.64	0.63	0.05	0.73	0.18	0.17
Sat Flow, veh/h	1529	200	1927	2090	690	968
Grp Volume(v), veh/h	0	718	134	540	222	0
Grp Sat Flow(s),veh/h/ln	0	1729	1927	2090	1666	0
Q Serve(g_s), s	0.0	28.2	2.4	10.3	14.0	0.0
Cycle Q Clear(g_c), s	0.0	28.2	2.4	10.3	14.0	0.0
Prop In Lane		0.12	1.00		0.41	0.58
Lane Grp Cap(c), veh/h	0	1107	474	1526	292	0
V/C Ratio(X)	0.00	0.65	0.28	0.35	0.76	0.00
Avail Cap(c_a), veh/h	0	1107	528	1526	603	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.2	9.9	5.4	43.5	0.0
Incr Delay (d2), s/veh	0.0	3.0	0.3	0.6	13.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	16.0	1.6	7.2	11.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	15.2	10.2	6.0	57.1	0.0
LnGrp LOS	A	B	B	A	E	A
Approach Vol, veh/h	718			674	222	
Approach Delay, s/veh	15.2			6.9	57.1	
Approach LOS	B			A	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.9	75.6		24.5		85.5
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	4.4	30.2		16.0		12.3
Green Ext Time (p_c), s	0.1	11.0		2.3		16.2
Intersection Summary						
HCM 6th Ctrl Delay			17.5			
HCM 6th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	818	0	1	836	103	0	0	1	49	0	36
Future Volume (vph)	17	818	0	1	836	103	0	0	1	49	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	852	0	1	978	0	0	1	0	51	38	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 66.3% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	818	0	1	836	103	0	0	1	49	0	36
Future Vol, veh/h	17	818	0	1	836	103	0	0	1	49	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	852	0	1	871	107	0	0	1	51	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	978	0	0	852	0	0	1834	1868	852	1816	1815	925
Stage 1	-	-	-	-	-	-	888	888	-	927	927	-
Stage 2	-	-	-	-	-	-	946	980	-	889	888	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	642	-	-	456	-	-	77	90	396	88	107	370
Stage 1	-	-	-	-	-	-	416	402	-	418	408	-
Stage 2	-	-	-	-	-	-	388	369	-	437	423	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	642	-	-	456	-	-	68	87	396	86	104	370
Mov Cap-2 Maneuver	-	-	-	-	-	-	68	87	-	86	104	-
Stage 1	-	-	-	-	-	-	404	391	-	406	407	-
Stage 2	-	-	-	-	-	-	348	368	-	424	411	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	14.1	61.6
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	396	642	-	-	456	-	-	86	370
HCM Lane V/C Ratio	0.003	0.028	-	-	0.002	-	-	0.594	0.101
HCM Control Delay (s)	14.1	10.8	-	-	12.9	-	-	95.2	15.8
HCM Lane LOS	B	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	2.7	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	577	50	156	672	16	262	3	164	35	4	15
Future Volume (vph)	22	577	50	156	672	16	262	3	164	35	4	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1740	0
Flt Permitted	0.381			0.265			0.744			0.536		
Satd. Flow (perm)	662	1783	1584	439	1697	1573	1327	1574	0	994	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			173			16
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	607	53	164	707	17	276	176	0	37	20	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	58.9	58.9	58.9	75.4	74.1	74.1	25.2	25.2		25.2	25.2	
Actuated g/C Ratio	0.54	0.54	0.54	0.69	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.06	0.64	0.06	0.40	0.62	0.02	0.91	0.36		0.16	0.05	
Control Delay	14.6	18.1	2.5	7.9	9.4	1.0	75.1	7.6		35.6	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.6	18.1	2.5	7.9	9.4	1.0	75.1	7.6		35.6	16.9	
LOS	B	B	A	A	A	A	E	A		D	B	
Approach Delay		16.8			9.0			48.8			29.0	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	6	173	0	27	155	0	189	2		21	2	
Queue Length 95th (ft)	m15	305	m6	47	227	m1	#341	57		50	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	354	954	886	481	1143	1068	314	505		235	425	
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	0.06	0.64	0.06	0.34	0.62	0.02	0.88	0.35		0.16	0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 20.8

Intersection LOS: C

Intersection Capacity Utilization 86.3%

ICU Level of Service E

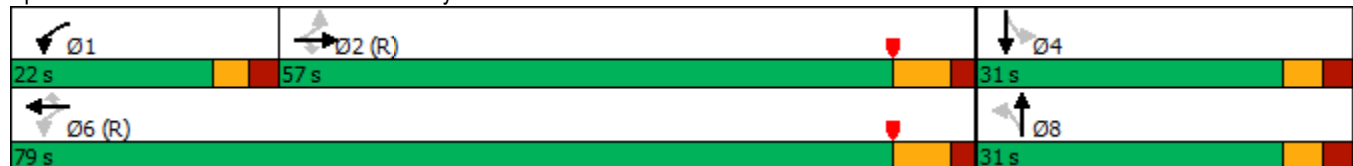
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2029 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	577	50	156	672	16	262	3	164	35	4	15
Future Volume (veh/h)	22	577	50	156	672	16	262	3	164	35	4	15
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	607	31	164	707	12	276	3	108	37	4	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	529	1176	1002	610	1193	1058	385	10	354	294	124	279
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.22	0.22	0.21	0.22	0.22	0.21
Sat Flow, veh/h	807	2047	1743	1666	1736	1540	1488	46	1645	1387	576	1296
Grp Volume(v), veh/h	23	607	31	164	707	12	276	0	111	37	0	13
Grp Sat Flow(s),veh/h/ln	807	2047	1743	1666	1736	1540	1488	0	1690	1387	0	1871
Q Serve(g_s), s	0.0	0.0	0.0	4.1	0.0	0.0	19.7	0.0	6.1	2.5	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.1	0.0	0.0	19.8	0.0	6.1	8.1	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.69
Lane Grp Cap(c), veh/h	529	1176	1002	610	1193	1058	385	0	364	294	0	403
V/C Ratio(X)	0.04	0.52	0.03	0.27	0.59	0.01	0.72	0.00	0.30	0.13	0.00	0.03
Avail Cap(c_a), veh/h	529	1176	1002	755	1193	1058	417	0	401	324	0	444
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)	1.00	1.00	1.00	0.80	0.80	0.80	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.2	0.0	0.0	41.7	0.0	36.7	39.4	0.0	34.4
Incr Delay (d2), s/veh	0.2	1.6	0.1	0.2	1.7	0.0	5.4	0.0	0.5	0.2	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(95%),veh/ln	0.0	1.0	0.0	2.1	1.0	0.0	12.4	0.0	4.7	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	1.6	0.1	6.4	1.7	0.0	47.0	0.0	37.1	39.6	0.0	34.4
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	661			883			387			50		
Approach Delay, s/veh	1.5			2.6			44.2			38.3		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.4	69.0		28.6		81.4		28.6				
Change Period (Y+Rc), s	5.5	6.8		* 5.9		6.8		* 5.9				
Max Green Setting (Gmax), s	16.5	50.2		* 25		72.2		* 25				
Max Q Clear Time (g_c+I1), s	6.6	2.5		10.6		2.5		22.3				
Green Ext Time (p_c), s	0.3	0.7		0.1		0.8		0.4				

Intersection Summary

HCM 6th Ctrl Delay 11.2
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	522	13	4	654	68	9	3	10	63	40	130
Future Volume (vph)	109	522	13	4	654	68	9	3	10	63	40	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1740	0	1744	1818	1561	0	1765	0	1719	1574	0
Flt Permitted	0.291			0.448				0.601		0.742		
Satd. Flow (perm)	513	1740	0	823	1818	1561	0	1082	0	1342	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		11			135	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	575	0	4	703	73	0	24	0	68	183	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.7	87.8		75.2	75.2	75.2		12.2		12.2	12.2	
Actuated g/C Ratio	0.81	0.80		0.68	0.68	0.68		0.11		0.11	0.11	
v/c Ratio	0.23	0.41		0.01	0.57	0.07		0.19		0.46	0.62	
Control Delay	4.1	5.1		6.5	13.1	1.8		31.7		54.7	23.6	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.1	5.1		6.5	13.4	1.8		31.7		54.7	23.6	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		4.9			12.3			31.7			32.0	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	16	90		1	287	2		8		46	32	
Queue Length 95th (ft)	m31	188		m3	468	9		33		87	98	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	514	1390		562	1242	1091		238		285	441	
Starvation Cap Reductn	0	0		0	117	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	0.23	0.41		0.01	0.62	0.07		0.10		0.24	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 12.5

Intersection LOS: B

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2029 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	522	13	4	654	68	9	3	10	63	40	130
Future Volume (veh/h)	109	522	13	4	654	68	9	3	10	63	40	130
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	117	561	12	4	703	60	10	3	7	68	43	69
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	609	1343	29	698	1399	1194	67	27	24	192	62	99
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09
Sat Flow, veh/h	1629	1655	35	875	1935	1652	182	282	250	1375	633	1015
Grp Volume(v), veh/h	117	0	573	4	703	60	20	0	0	68	0	112
Grp Sat Flow(s),veh/h/ln	1629	0	1690	875	1935	1652	713	0	0	1375	0	1648
Q Serve(g_s), s	1.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.3
Cycle Q Clear(g_c), s	1.8	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	5.7	0.0	7.3
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.35	1.00		0.62
Lane Grp Cap(c), veh/h	609	0	1372	698	1399	1194	112	0	0	192	0	160
V/C Ratio(X)	0.19	0.00	0.42	0.01	0.50	0.05	0.18	0.00	0.00	0.35	0.00	0.70
Avail Cap(c_a), veh/h	671	0	1372	698	1399	1194	279	0	0	350	0	351
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	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.4	0.0	0.0	0.0	0.0	0.0	45.9	0.0	0.0	47.4	0.0	48.4
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.2	0.1	0.8	0.0	0.0	1.1	0.0	5.4
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(95%),veh/ln	0.7	0.0	0.5	0.0	0.8	0.0	1.0	0.0	0.0	3.3	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.5	0.0	0.7	0.0	1.2	0.1	46.6	0.0	0.0	48.5	0.0	53.8
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	690			767			20			180		
Approach Delay, s/veh	1.0			1.1			46.6			51.8		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.8	84.9	15.3		94.7		15.3					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.3	2.5	9.3		2.5		9.3					
Green Ext Time (p_c), s	0.1	0.9	0.5		0.7		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				7.1								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	499	24	21	534	14	68	24	18	16	21	76
Future Volume (vph)	55	499	24	21	534	14	68	24	18	16	21	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1744	0	1620	1698	0	1541	1658	0	0	1823	0
Flt Permitted	0.415			0.429			0.531				0.950	
Satd. Flow (perm)	721	1744	0	732	1698	0	861	1658	0	0	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			19			80	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	550	0	22	577	0	72	44	0	0	119	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.4	86.4		86.4	86.4		13.7	13.7			13.7	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.10	0.40		0.04	0.43		0.67	0.20			0.41	
Control Delay	5.5	6.7		3.7	5.6		74.1	28.6			20.6	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0			0.0	
Total Delay	5.5	6.8		3.7	5.6		74.1	28.6			20.6	
LOS	A	A		A	A		E	C			C	
Approach Delay		6.7			5.5			56.9			20.6	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	11	154		3	106		49	16			25	
Queue Length 95th (ft)	30	206		11	209		95	47			75	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	566	1370		574	1333		320	629			700	
Starvation Cap Reductn	0	190		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	19		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.10	0.47		0.04	0.44		0.23	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.4

Intersection LOS: B

Intersection Capacity Utilization 69.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2029 No Build
SAT Peak Hour

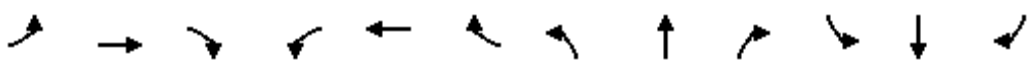
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	499	24	21	534	14	68	24	18	16	21	76
Future Volume (veh/h)	55	499	24	21	534	14	68	24	18	16	21	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	58	525	20	22	562	14	72	25	7	17	22	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	650	1381	53	798	1544	38	173	103	29	63	53	64
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	771	1661	63	881	1857	46	1242	1315	368	286	677	815
Grp Volume(v), veh/h	58	0	545	22	0	576	72	0	32	72	0	0
Grp Sat Flow(s),veh/h/ln	771	0	1724	881	0	1903	1242	0	1683	1778	0	0
Q Serve(g_s), s	0.8	0.0	0.0	0.5	0.0	8.0	1.1	0.0	2.0	1.9	0.0	0.0
Cycle Q Clear(g_c), s	8.8	0.0	0.0	0.5	0.0	8.0	5.3	0.0	2.0	4.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	1.00		0.22	0.24		0.46
Lane Grp Cap(c), veh/h	650	0	1434	798	0	1583	173	0	132	164	0	0
V/C Ratio(X)	0.09	0.00	0.38	0.03	0.00	0.36	0.42	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	650	0	1434	798	0	1583	538	0	627	675	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(l)	0.91	0.00	0.91	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	1.6	0.0	2.2	49.1	0.0	47.7	49.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.1	0.0	0.6	1.6	0.0	0.9	1.9	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	3.2	3.6	0.0	1.5	3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.0	0.7	1.7	0.0	2.9	50.7	0.0	48.7	50.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	603			598			104			72		
Approach Delay, s/veh	0.7			2.8			50.1			50.8		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.4			13.6			96.4			13.6		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.2			10.0			7.3		
Green Ext Time (p_c), s	19.9			0.2			20.9			0.3		
Intersection Summary												
HCM 6th Ctrl Delay			8.0									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (vph)	0	0	0	346	1	60	211	116	0	0	130	28
Future Volume (vph)	0	0	0	346	1	60	211	116	0	0	130	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1642	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.953		0.496					
Satd. Flow (perm)	0	0	0	0	1642	1442	822	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	361	63	220	121	0	0	135	29
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.7	16.7	27.3	27.3			14.2	14.2
Actuated g/C Ratio					0.31	0.31	0.51	0.51			0.26	0.26
v/c Ratio					0.71	0.11	0.41	0.14			0.29	0.05
Control Delay					24.8	0.4	11.0	8.5			18.7	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					24.8	0.4	11.0	8.5			18.7	0.2
LOS					C	A	B	A			B	A
Approach Delay					21.2			10.1			15.5	
Approach LOS					C			B			B	
Queue Length 50th (ft)					95	0	38	19			35	0
Queue Length 95th (ft)					189	0	80	46			77	0
Internal Link Dist (ft)		920			920			470			916	

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					633	656	531	925			556	610
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					0.57	0.10	0.41	0.13			0.24	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 53.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 16.1

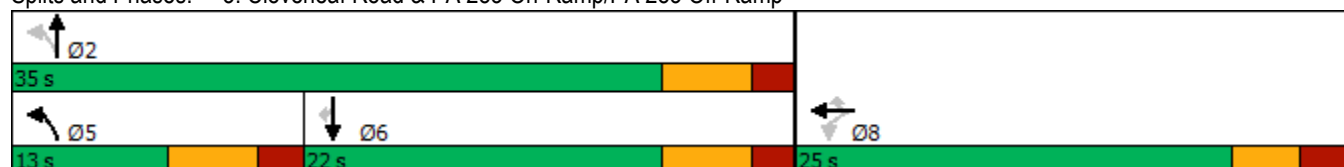
Intersection LOS: B

Intersection Capacity Utilization 55.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	346	1	60	211	116	0	0	130	28
Future Volume (veh/h)	0	0	0	346	1	60	211	116	0	0	130	28
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				360	1	0	220	121	0	0	135	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				483	1		654	908	0	0	502	
Arrive On Green				0.25	0.27	0.00	0.16	0.53	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1781	5	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				361	0	0	220	121	0	0	135	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				9.0	0.0	0.0	4.0	1.7	0.0	0.0	2.8	0.0
Cycle Q Clear(g_c), s				9.0	0.0	0.0	4.0	1.7	0.0	0.0	2.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				485	0		654	908	0	0	502	
V/C Ratio(X)				0.74	0.00		0.34	0.13	0.00	0.00	0.27	
Avail Cap(c_a), veh/h				759	0		667	1062	0	0	656	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.5	0.0	0.0	8.1	5.7	0.0	0.0	13.9	0.0
Incr Delay (d2), s/veh				2.3	0.0	0.0	0.3	0.2	0.0	0.0	1.0	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
%ile BackOfQ(95%),veh/ln				6.6	0.0	0.0	1.8	0.8	0.0	0.0	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.8	0.0	0.0	8.4	5.9	0.0	0.0	14.9	0.0
LnGrp LOS				B	A		A	A	A	A	B	
Approach Vol, veh/h					361			341			135	
Approach Delay, s/veh					18.8			7.5			14.9	
Approach LOS					B			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		30.6			12.6	18.0		17.6				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		3.7			6.0	4.8		11.0				
Green Ext Time (p_c), s		2.3			0.1	1.5		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.6								
HCM 6th LOS				B								

Notes

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

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	214	0	0	0	0	294	355	89	390	0
Future Volume (vph)	24	0	214	0	0	0	0	294	355	89	390	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	230	0	0	0	0	698	0	96	419	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 55.5% ICU Level of Service B

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2029 No Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	24	0	214	0	0	0	0	294	355	89	390	0
Future Vol, veh/h	24	0	214	0	0	0	0	294	355	89	390	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	26	0	230	0	0	0	0	316	382	96	419	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	927	927	419	-	0	0	316	0	0
Stage 1	611	611	-	-	-	-	-	-	-
Stage 2	316	316	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	308	316	695	0	-	-	969	-	0
Stage 1	647	540	-	0	-	-	-	-	0
Stage 2	861	694	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	278	0	695	-	-	-	969	-	-
Mov Cap-2 Maneuver	278	0	-	-	-	-	-	-	-
Stage 1	647	0	-	-	-	-	-	-	-
Stage 2	776	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	278	695	969	-
HCM Lane V/C Ratio	-	-	0.093	0.331	0.099	-
HCM Control Delay (s)	-	-	19.3	12.7	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	1.4	0.3	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 No Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	14	621	619	3
Future Volume (vph)	6	11	14	621	619	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1796	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1796	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	676	662	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	53.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 No Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	14	621	619	3
Future Vol, veh/h	6	11	14	621	619	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	15	661	659	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1352	661	662	0	-	0
Stage 1	661	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	164	488	762	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	159	488	762	-	-	-
Mov Cap-2 Maneuver	159	-	-	-	-	-
Stage 1	518	-	-	-	-	-
Stage 2	517	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.6	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	762	-	282	-	-
HCM Lane V/C Ratio	0.02	-	0.064	-	-
HCM Control Delay (s)	9.8	0	18.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	24	54	11	22	33	30	459	8	20	437	185
Future Volume (vph)	155	24	54	11	22	33	30	459	8	20	437	185
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1685	0	1572	1636	0	1620	1712	0	1550	1683	0
Flt Permitted	0.719			0.704			0.339			0.450		
Satd. Flow (perm)	1226	1685	0	1165	1636	0	578	1712	0	734	1683	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			35			2			60	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	82	0	12	58	0	32	491	0	21	655	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.8	12.8		12.5	12.5		40.4	40.4		40.4	40.4	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.67	0.67		0.67	0.67	
v/c Ratio	0.62	0.20		0.05	0.16		0.08	0.43		0.04	0.57	
Control Delay	32.0	9.8		17.9	11.1		5.5	8.1		5.9	9.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	32.0	9.8		17.9	11.1		5.5	8.1		5.9	9.3	
LOS	C	A		B	B		A	A		A	A	
Approach Delay		24.6			12.2			7.9			9.2	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)	52	7		3	7		4	89		3	122	
Queue Length 95th (ft)	104	35		14	30		m15	205		11	230	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	464		291	435		389	1154		495	1154	
Starvation Cap Reductn	0	0		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	0.53	0.18		0.04	0.13		0.08	0.43		0.04	0.57	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 11.4

Intersection LOS: B

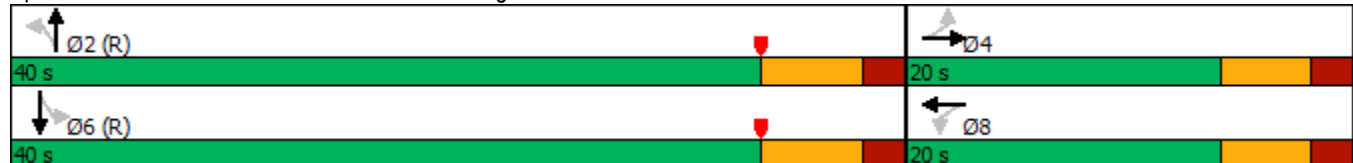
Intersection Capacity Utilization 60.7%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary
11: Cloverleaf Rd & Schwanger Rd

2029 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	24	54	11	22	33	30	459	8	20	437	185
Future Volume (veh/h)	155	24	54	11	22	33	30	459	8	20	437	185
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	163	25	30	12	23	21	32	483	7	21	460	161
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	350	156	187	319	160	146	498	1181	17	499	880	308
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.21	0.21	0.21	0.64	0.64	0.63
Sat Flow, veh/h	1436	855	1026	1262	876	800	821	1838	27	910	1369	479
Grp Volume(v), veh/h	163	0	55	12	0	44	32	0	490	21	0	621
Grp Sat Flow(s),veh/h/ln	1436	0	1881	1262	0	1676	821	0	1864	910	0	1849
Q Serve(g_s), s	6.5	0.0	1.5	0.5	0.0	1.3	2.0	0.0	13.6	0.8	0.0	10.9
Cycle Q Clear(g_c), s	7.8	0.0	1.5	2.0	0.0	1.3	12.9	0.0	13.6	14.4	0.0	10.9
Prop In Lane	1.00		0.55	1.00		0.48	1.00		0.01	1.00		0.26
Lane Grp Cap(c), veh/h	350	0	343	319	0	306	498	0	1198	499	0	1188
V/C Ratio(X)	0.47	0.00	0.16	0.04	0.00	0.14	0.06	0.00	0.41	0.04	0.00	0.52
Avail Cap(c_a), veh/h	447	0	470	404	0	419	498	0	1198	499	0	1188
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.94	0.00	0.94	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	20.9	21.5	0.0	20.8	18.2	0.0	13.8	10.5	0.0	5.9
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0	1.0	0.2	0.0	1.6
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(95%),veh/ln	3.8	0.0	1.1	0.2	0.0	0.9	0.8	0.0	10.9	0.3	0.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	21.1	21.5	0.0	21.0	18.5	0.0	14.8	10.6	0.0	7.5
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	A
Approach Vol, veh/h	218			56			522			642		
Approach Delay, s/veh	23.9			21.1			15.0			7.6		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.1			15.9			44.1			15.9		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	15.6			9.8			12.9			4.0		
Green Ext Time (p_c), s	9.4			0.3			13.3			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	13.3											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	13	24	0	7	16	488	7	11	508	7
Future Volume (vph)	5	1	13	24	0	7	16	488	7	11	508	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1696	0	0	1668	0	0	1722	1648
Flt Permitted					0.990			0.981			0.988	
Satd. Flow (perm)	0	1740	1581	0	1746	0	0	1639	0	0	1703	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	14	0	32	0	0	538	0	0	547	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.13			0.37			0.36	0.00
Control Delay		23.5	0.5		5.2			3.0			1.5	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.5		5.2			3.0			1.5	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.4			5.2			3.0			1.5	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		13			110			13	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		379			1453			1509	1466
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		0.02	0.04		0.08			0.37			0.36	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 2.4

Intersection LOS: A

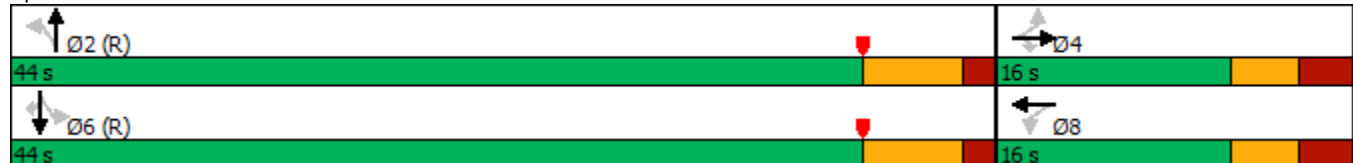
Intersection Capacity Utilization 57.7%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	13	24	0	7	16	488	7	11	508	7
Future Volume (veh/h)	5	1	13	24	0	7	16	488	7	11	508	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	7	25	0	3	17	514	7	12	535	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	172	12	71	164	0	6	77	1329	18	70	1452	1317
Arrive On Green	0.03	0.04	0.04	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1393	279	1586	1121	0	134	19	1668	22	11	1822	1652
Grp Volume(v), veh/h	6	0	7	28	0	0	538	0	0	547	0	7
Grp Sat Flow(s),veh/h/ln	1672	0	1586	1255	0	0	1709	0	0	1833	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.3	1.4	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.89		0.11	0.03		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	157	0	71	149	0	0	1396	0	0	1492	0	1317
V/C Ratio(X)	0.04	0.00	0.10	0.19	0.00	0.00	0.39	0.00	0.00	0.37	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1396	0	0	1492	0	1317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.81	0.00	0.81
Uniform Delay (d), s/veh	27.9	0.0	27.5	28.6	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.6	0.0	0.0	0.8	0.0	0.0	0.6	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(95%),veh/ln	0.2	0.0	0.2	0.8	0.0	0.0	1.0	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	28.1	29.2	0.0	0.0	2.6	0.0	0.0	0.6	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	13			28			538			554		
Approach Delay, s/veh	28.0			29.2			2.6			0.6		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	52.8			7.2			52.8			7.2		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	7.6			2.3			2.0			3.4		
Green Ext Time (p_c), s	14.6			0.0			16.4			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	2.6											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	208	296	56	27	318	139	72	168	15	129	177	185
Future Volume (vph)	208	296	56	27	318	139	72	168	15	129	177	185
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1845	0	1558	1624	1499
Flt Permitted	0.282			0.576			0.643			0.624		
Satd. Flow (perm)	467	1809	1435	926	1731	1592	1175	1845	0	1023	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		5				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	212	302	57	28	324	142	73	186	0	132	181	189
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	30.4	30.4	30.4	16.5	16.5	16.5	19.1	13.2		19.3	13.3	13.3
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.29	0.20		0.29	0.20	0.20
v/c Ratio	0.60	0.36	0.08	0.12	0.75	0.24	0.18	0.50		0.36	0.55	0.38
Control Delay	22.4	15.0	0.2	23.2	37.6	1.0	14.7	29.1		17.3	32.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	22.4	15.0	0.2	23.2	37.6	1.0	14.7	29.1		17.3	32.1	3.8
LOS	C	B	A	C	D	A	B	C		B	C	A
Approach Delay		16.3			26.2			25.1			17.6	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	57	85	0	9	130	0	20	71		37	72	0
Queue Length 95th (ft)	#125	154	0	30	#259	0	44	129		73	132	24
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	353	905	798	268	500	641	412	509		366	444	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.60	0.33	0.07	0.10	0.65	0.22	0.18	0.37		0.36	0.41	0.32

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 66

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 20.6

Intersection LOS: C

Intersection Capacity Utilization 66.8%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	208	296	56	27	318	139	72	168	15	129	177	185
Future Volume (veh/h)	208	296	56	27	318	139	72	168	15	129	177	185
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	212	302	51	28	324	0	73	171	12	132	181	107
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	411	836	708	339	411		367	279	20	372	305	269
Arrive On Green	0.13	0.45	0.45	0.23	0.23	0.00	0.07	0.14	0.12	0.11	0.19	0.19
Sat Flow, veh/h	1723	1837	1557	956	1794	1557	2069	2018	142	1576	1641	1450
Grp Volume(v), veh/h	212	302	51	28	324	0	73	0	183	132	181	107
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	956	1794	1557	2069	0	2160	1576	1641	1450
Q Serve(g_s), s	5.0	6.4	1.1	1.4	10.2	0.0	1.7	0.0	4.8	4.1	6.0	3.9
Cycle Q Clear(g_c), s	5.0	6.4	1.1	1.4	10.2	0.0	1.7	0.0	4.8	4.1	6.0	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	411	836	708	339	411		367	0	298	372	305	269
V/C Ratio(X)	0.52	0.36	0.07	0.08	0.79		0.20	0.00	0.61	0.35	0.59	0.40
Avail Cap(c_a), veh/h	411	982	832	416	555		504	0	632	402	480	424
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.8	10.6	9.2	18.3	21.7	0.0	19.7	0.0	24.3	18.4	22.3	21.4
Incr Delay (d2), s/veh	1.1	0.1	0.0	0.0	3.7	0.0	0.3	0.0	2.0	0.6	1.8	0.9
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(95%),veh/ln	3.0	3.6	0.5	0.5	7.3	0.0	1.5	0.0	4.5	2.4	4.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.9	10.7	9.2	18.4	25.4	0.0	20.0	0.0	26.4	19.0	24.1	22.4
LnGrp LOS	B	B	A	B	C		B	A	C	B	C	C
Approach Vol, veh/h	565			352			256			420		
Approach Delay, s/veh	12.2			24.8			24.5			22.1		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	19.2	12.9	14.3		32.7	10.0	17.1				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	7.5	12.7	6.6	6.8		8.9	4.2	8.5				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.5		0.1	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Notes

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

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2029 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	50	33	16	33	48	20	179	7	25	182	34
Future Volume (vph)	39	50	33	16	33	48	20	179	7	25	182	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1680	0	0	1633	0	0	1772	0	0	1850	0
Flt Permitted		0.984			0.992			0.995			0.995	
Satd. Flow (perm)	0	1680	0	0	1633	0	0	1772	0	0	1850	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	0	0	101	0	0	214	0	0	251	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.4%											
Analysis Period (min)	15											
	ICU Level of Service A											

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

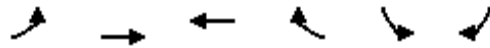
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	39	50	33	16	33	48	20	179	7	25	182	34
Future Vol, veh/h	39	50	33	16	33	48	20	179	7	25	182	34
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	41	52	34	17	34	50	21	186	7	26	190	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	8.8	9.9	10
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	32%	16%	10%
Vol Thru, %	87%	41%	34%	76%
Vol Right, %	3%	27%	49%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	206	122	97	241
LT Vol	20	39	16	25
Through Vol	179	50	33	182
RT Vol	7	33	48	34
Lane Flow Rate	215	127	101	251
Geometry Grp	1	1	1	1
Degree of Util (X)	0.289	0.182	0.138	0.326
Departure Headway (Hd)	4.854	5.165	4.91	4.671
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	736	689	723	763
Service Time	2.919	3.243	2.99	2.733
HCM Lane V/C Ratio	0.292	0.184	0.14	0.329
HCM Control Delay	9.9	9.4	8.8	10
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.7	0.5	1.4

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2029 No Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	398	434	34	32	3
Future Volume (vph)	3	398	434	34	32	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1793	0	1660	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1793	0	1660	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	415	487	0	36	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.9% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	398	434	34	32	3
Future Vol, veh/h	3	398	434	34	32	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	415	452	35	33	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	487	0	0 891 470
Stage 1	-	-	- 470 -
Stage 2	-	-	- 421 -
Critical Hdwy	4.1	-	- 6.8 6.4
Critical Hdwy Stg 1	-	-	- 5.8 -
Critical Hdwy Stg 2	-	-	- 5.8 -
Follow-up Hdwy	3	-	- 3 3.1
Pot Cap-1 Maneuver	838	-	- 316 612
Stage 1	-	-	- 680 -
Stage 2	-	-	- 722 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	838	-	- 315 612
Mov Cap-2 Maneuver	-	-	- 462 -
Stage 1	-	-	- 677 -
Stage 2	-	-	- 722 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	838	-	-	-	472
HCM Lane V/C Ratio	0.004	-	-	-	0.077
HCM Control Delay (s)	9.3	-	-	-	13.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

APPENDIX L6

2029 BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (vph)	457	80	90	397	146	155
Future Volume (vph)	457	80	90	397	146	155
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1685	0	1662	1766	1530	0
Flt Permitted			0.205		0.976	
Satd. Flow (perm)	1685	0	359	1766	1530	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	15					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	100	441	334	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.4		42.2	41.0	18.6	
Actuated g/C Ratio	0.45		0.60	0.59	0.27	
v/c Ratio	0.78		0.28	0.43	0.82	
Control Delay	26.8		5.8	6.6	43.2	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	26.8		5.8	6.6	43.2	
LOS	C		A	A	D	
Approach Delay	26.8			6.5	43.2	
Approach LOS	C			A	D	
Queue Length 50th (ft)	219		12	59	134	
Queue Length 95th (ft)	#407		m22	83	#266	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	765		365	1034	410	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.78		0.27	0.43	0.81	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 23.0

Intersection LOS: C

Intersection Capacity Utilization 66.5%

ICU Level of Service C

Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	34 s	24 s
↖ Ø6 (R)		
46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2029 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	457	80	90	397	146	155
Future Volume (veh/h)	457	80	90	397	146	155
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	508	83	100	441	162	172
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	651	106	382	1164	194	206
Arrive On Green	0.47	0.46	0.15	1.00	0.25	0.23
Sat Flow, veh/h	1381	226	1846	1927	785	834
Grp Volume(v), veh/h	0	591	100	441	335	0
Grp Sat Flow(s),veh/h/ln	0	1607	1846	1927	1624	0
Q Serve(g_s), s	0.0	21.6	1.7	0.0	13.7	0.0
Cycle Q Clear(g_c), s	0.0	21.6	1.7	0.0	13.7	0.0
Prop In Lane		0.14	1.00		0.48	0.51
Lane Grp Cap(c), veh/h	0	757	382	1164	402	0
V/C Ratio(X)	0.00	0.78	0.26	0.38	0.83	0.00
Avail Cap(c_a), veh/h	0	757	454	1164	436	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	15.5	10.2	0.0	25.2	0.0
Incr Delay (d2), s/veh	0.0	7.8	0.4	0.9	16.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	13.1	1.0	0.5	11.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	23.4	10.6	0.9	41.7	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	591			541	335	
Approach Delay, s/veh	23.4			2.7	41.7	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.3	38.2		22.5		47.5
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.7	23.6		15.7		2.0
Green Ext Time (p_c), s	0.1	3.0		0.6		11.6
Intersection Summary						
HCM 6th Ctrl Delay			19.9			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	641	1	0	583	47	0	0	2	47	0	35
Future Volume (vph)	26	641	1	0	583	47	0	0	2	47	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	721	0	0	708	0	0	2	0	53	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 49.9%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	641	1	0	583	47	0	0	2	47	0	35
Future Vol, veh/h	26	641	1	0	583	47	0	0	2	47	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	29	720	1	0	655	53	0	0	2	53	0	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	708	0	0	721	0	0	1481	1487	722	1463	1461	683
Stage 1	-	-	-	-	-	-	779	779	-	682	682	-
Stage 2	-	-	-	-	-	-	702	708	-	781	779	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	720	-	-	531	-	-	133	148	381	148	166	446
Stage 1	-	-	-	-	-	-	475	446	-	555	507	-
Stage 2	-	-	-	-	-	-	522	477	-	495	466	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	720	-	-	531	-	-	117	142	381	143	159	446
Mov Cap-2 Maneuver	-	-	-	-	-	-	117	142	-	143	159	-
Stage 1	-	-	-	-	-	-	456	428	-	533	507	-
Stage 2	-	-	-	-	-	-	476	477	-	472	447	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	14.5	31.3
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	381	720	-	-	531	-	-	143	446
HCM Lane V/C Ratio	0.006	0.041	-	-	-	-	-	0.369	0.088
HCM Control Delay (s)	14.5	10.2	-	-	0	-	-	44.2	13.9
HCM Lane LOS	B	B	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1.5	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	555	45	64	518	6	104	2	73	4	3	2
Future Volume (vph)	3	555	45	64	518	6	104	2	73	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.448			0.282			0.754			0.703		
Satd. Flow (perm)	779	1667	1552	458	1558	1608	1302	1516	0	1303	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45		81			2	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	617	50	71	576	7	116	83	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	42.2	42.2	42.2	52.2	52.1	52.1	10.8	10.8		10.7	10.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.61	0.05	0.16	0.50	0.01	0.58	0.27		0.02	0.02	
Control Delay	6.7	9.8	0.1	1.6	3.3	0.0	39.1	9.7		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	9.8	0.1	1.6	3.3	0.0	39.1	9.7		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		9.1			3.1			26.8			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	93	0	7	63	0	46	1		1	1	
Queue Length 95th (ft)	m1	m124	m0	1	12	m0	95	35		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	470	1005	988	473	1159	1208	225	329		225	320	
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	0.01	0.61	0.05	0.15	0.50	0.01	0.52	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 8.9

Intersection LOS: A

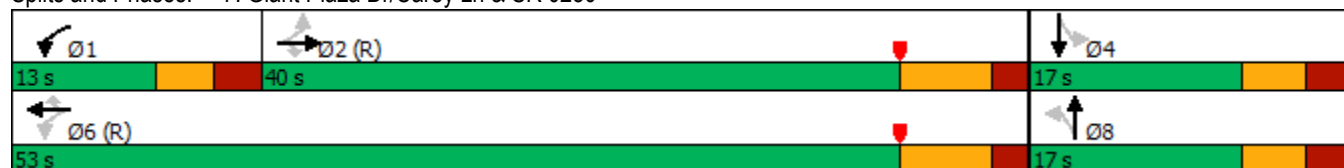
Intersection Capacity Utilization 67.8%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	555	45	64	518	6	104	2	73	4	3	2
Future Volume (veh/h)	3	555	45	64	518	6	104	2	73	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	617	34	71	576	6	116	2	43	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	660	1183	1047	624	1165	1116	283	9	199	259	145	97
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	917	1947	1722	1640	1609	1542	1461	75	1612	1467	1176	784
Grp Volume(v), veh/h	3	617	34	71	576	6	116	0	45	4	0	5
Grp Sat Flow(s),veh/h/ln	917	1947	1722	1640	1609	1542	1461	0	1687	1467	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	5.3	0.0	1.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.0	0.0	0.0	5.3	0.0	1.7	1.4	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	660	1183	1047	624	1165	1116	283	0	208	259	0	242
V/C Ratio(X)	0.00	0.52	0.03	0.11	0.49	0.01	0.41	0.00	0.22	0.02	0.00	0.02
Avail Cap(c_a), veh/h	660	1183	1047	739	1165	1116	355	0	292	331	0	339
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(l)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.3	0.0	0.0	29.2	0.0	28.1	28.0	0.0	27.1
Incr Delay (d2), s/veh	0.0	1.6	0.1	0.1	1.4	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	1.0	0.0	0.3	0.8	0.0	3.4	0.0	1.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.6	0.1	3.3	1.4	0.0	30.2	0.0	28.6	28.1	0.0	27.2
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	654			653			161			9		
Approach Delay, s/veh	1.6			1.6			29.7			27.6		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	8.1	48.3	13.5			56.5	13.5					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11			46.2	* 11					
Max Q Clear Time (g_c+I1), s	3.5	2.5	3.9			2.5	7.8					
Green Ext Time (p_c), s	0.0	0.8	0.0			0.7	0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.8
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	480	14	5	554	13	9	0	15	6	0	8
Future Volume (vph)	26	480	14	5	554	13	9	0	15	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1660	0	1744	1654	1445	0	1727	0	1719	1501	0
Flt Permitted	0.359			0.467				0.870				
Satd. Flow (perm)	633	1660	0	857	1654	1415	0	1530	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				126		139			377	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	531	0	5	596	14	0	26	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.36		0.01	0.43	0.01		0.09		0.03	0.02	
Control Delay	0.8	2.6		3.6	5.2	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.8	2.6		3.6	5.2	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.5			5.1			0.7			11.5	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	85		m1	181	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	645	1493		716	1383	1204		325		242	527	
Starvation Cap Reductn	0	0		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	0.04	0.36		0.01	0.43	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 3.9

Intersection LOS: A

Intersection Capacity Utilization 47.3%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2029 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	480	14	5	554	13	9	0	15	6	0	8
Future Volume (veh/h)	26	480	14	5	554	13	9	0	15	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	28	516	15	5	596	14	10	0	15	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	691	1288	37	760	1295	1123	88	0	24	161	70	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1573	46	909	1793	1554	418	0	626	1360	1837	0
Grp Volume(v), veh/h	28	0	531	5	596	14	25	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1618	909	1793	1554	1044	0	0	1360	1837	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.40		0.60	1.00		0.00
Lane Grp Cap(c), veh/h	691	0	1326	760	1295	1123	97	0	0	161	70	0
V/C Ratio(X)	0.04	0.00	0.40	0.01	0.46	0.01	0.26	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	790	0	1326	760	1295	1123	241	0	0	292	247	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(l)	0.76	0.00	0.76	0.90	0.90	0.90	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	33.9	0.0	0.0	32.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.0	1.1	0.0	1.4	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.5	0.0	0.7	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.7	0.0	1.1	0.0	35.3	0.0	0.0	32.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	559			615			25			6		
Approach Delay, s/veh	0.7			1.0			35.3			32.6		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.8	56.0	7.3		62.7		7.3					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.8	2.5	2.7		2.5		3.7					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	1.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	450	1	10	456	25	60	27	36	29	16	47
Future Volume (vph)	38	450	1	10	456	25	60	27	36	29	16	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1593	0	1248	1497	0	0	1795	0
Flt Permitted	0.443			0.463			0.759				0.870	
Satd. Flow (perm)	785	1685	0	607	1593	0	997	1497	0	0	1584	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			39			51	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	485	0	11	517	0	65	68	0	0	99	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.3	52.3		52.3	52.3		11.1	11.1			11.1	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.07	0.39		0.02	0.43		0.41	0.25			0.34	
Control Delay	1.0	1.5		4.6	6.4		33.2	15.3			16.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.0	1.5		4.6	6.4		33.2	15.3			16.8	
LOS	A	A		A	A		C	B			B	
Approach Delay		1.4			6.4			24.0			16.8	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	8		1	78		26	11			18	
Queue Length 95th (ft)	3	17		7	174		56	40			52	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	586	1258		453	1192		284	455			489	
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	0.07	0.39		0.02	0.43		0.23	0.15			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 7.0

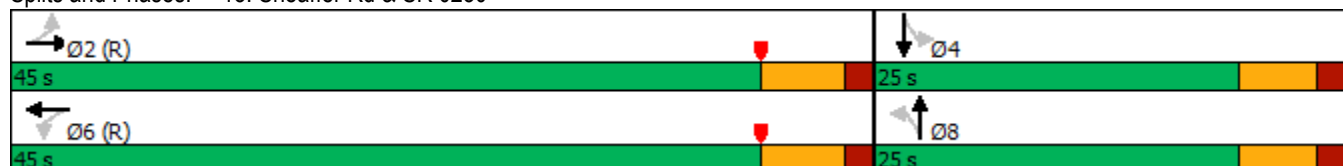
Intersection LOS: A

Intersection Capacity Utilization 53.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2029 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	450	1	10	456	25	60	27	36	29	16	47
Future Volume (veh/h)	38	450	1	10	456	25	60	27	36	29	16	47
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		0.99	1.00		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	41	484	0	11	490	26	65	29	17	31	17	33
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	653	1276	0	653	1306	69	218	98	58	114	45	60
Arrive On Green	1.00	1.00	0.00	0.76	0.76	0.75	0.10	0.10	0.08	0.08	0.10	0.08
Sat Flow, veh/h	828	1680	0	724	1719	91	1000	999	585	431	455	609
Grp Volume(v), veh/h	41	484	0	11	0	516	65	0	46	81	0	0
Grp Sat Flow(s),veh/h/ln	828	1680	0	724	0	1810	1000	0	1584	1496	0	0
Q Serve(g_s), s	0.5	0.0	0.0	0.3	0.0	6.7	0.0	0.0	1.9	2.0	0.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	0.0	0.3	0.0	6.7	3.3	0.0	1.9	3.9	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.05	1.00		0.37	0.38		0.41
Lane Grp Cap(c), veh/h	653	1276	0	653	0	1376	218	0	156	197	0	0
V/C Ratio(X)	0.06	0.38	0.00	0.02	0.00	0.38	0.30	0.00	0.29	0.41	0.00	0.00
Avail Cap(c_a), veh/h	653	1276	0	653	0	1376	405	0	453	507	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(l)	0.94	0.94	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.5	0.0	0.0	2.0	0.0	2.8	29.9	0.0	29.5	30.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.8	0.0	0.0	0.0	0.8	0.8	0.0	1.0	1.4	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(95%),veh/ln	0.1	0.5	0.0	0.0	0.0	2.3	1.9	0.0	1.3	2.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.8	0.0	2.1	0.0	3.6	30.7	0.0	30.5	32.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	525			527			111			81		
Approach Delay, s/veh	0.8			3.6			30.6			32.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	58.1			11.9			58.1			11.9		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			5.9			8.7			5.3		
Green Ext Time (p_c), s	14.5			0.2			14.5			0.3		

Intersection Summary

HCM 6th Ctrl Delay 6.7
HCM 6th LOS A

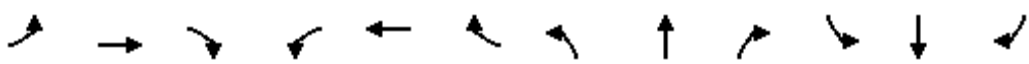
Notes

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

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↕	↗
Traffic Volume (vph)	0	0	0	394	0	90	565	153	0	0	211	57
Future Volume (vph)	0	0	0	394	0	90	565	153	0	0	211	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.442					
Satd. Flow (perm)	0	0	0	0	1546	1145	718	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	410	94	589	159	0	0	220	59
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.5	16.5	32.8	32.8			15.8	15.8
Actuated g/C Ratio					0.28	0.28	0.56	0.56			0.27	0.27
v/c Ratio					0.94	0.21	1.04	0.20			0.54	0.11
Control Delay					56.7	2.0	62.8	7.2			23.9	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					56.7	2.0	62.8	7.2			23.9	0.4
LOS					E	A	E	A			C	A
Approach Delay					46.5			51.0			18.9	
Approach LOS					D			D			B	
Queue Length 50th (ft)					145	0	~141	25			66	0
Queue Length 95th (ft)					#302	9	#406	50			125	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					434	439	569	824			441	550
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	0.21	1.04	0.19			0.50	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 43.7

Intersection LOS: D

Intersection Capacity Utilization 93.6%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	394	0	90	565	153	0	0	211	57
Future Volume (veh/h)	0	0	0	394	0	90	565	153	0	0	211	57
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				410	0	0	589	159	0	0	220	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				496	0		613	813	0	0	395	
Arrive On Green				0.26	0.00	0.00	0.22	0.55	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				410	0	0	589	159	0	0	220	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				11.8	0.0	0.0	12.0	3.0	0.0	0.0	6.4	0.0
Cycle Q Clear(g_c), s				11.8	0.0	0.0	12.0	3.0	0.0	0.0	6.4	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				496	0		613	813	0	0	395	
V/C Ratio(X)				0.83	0.00		0.96	0.20	0.00	0.00	0.56	
Avail Cap(c_a), veh/h				539	0		613	922	0	0	516	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.0	0.0	0.0	14.0	6.2	0.0	0.0	18.3	0.0
Incr Delay (d2), s/veh				9.6	0.0	0.0	26.8	0.4	0.0	0.0	4.4	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
%ile BackOfQ(95%),veh/ln				9.9	0.0	0.0	13.4	1.3	0.0	0.0	4.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				28.7	0.0	0.0	40.8	6.7	0.0	0.0	22.7	0.0
LnGrp LOS				C	A		D	A	A	A	C	
Approach Vol, veh/h					410			748			220	
Approach Delay, s/veh					28.7			33.6			22.7	
Approach LOS					C			C			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	35.0			17.0			18.0			19.7		
Change Period (Y+Rc), s	6.0			6.0			6.0			5.5		
Max Green Setting (Gmax), s	33.0			11.0			16.0			15.5		
Max Q Clear Time (g_c+I1), s	5.0			14.0			8.4			13.8		
Green Ext Time (p_c), s	3.4			0.0			2.1			0.4		
Intersection Summary												
HCM 6th Ctrl Delay	30.4											
HCM 6th LOS	C											

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2	289	0	0	0	0	686	623	109	488	0
Future Volume (vph)	32	2	289	0	0	0	0	686	623	109	488	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1629	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1629	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	307	0	0	0	0	1393	0	116	519	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	93.6%						ICU Level of Service F					
Analysis Period (min)	15											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2029 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	32	2	289	0	0	0	0	686	623	109	488	0
Future Vol, veh/h	32	2	289	0	0	0	0	686	623	109	488	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	34	2	307	0	0	0	0	730	663	116	519	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1481	1481	519	-	0	0	730	0	0
Stage 1	751	751	-	-	-	-	-	-	-
Stage 2	730	730	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	131	162	592	0	-	-	695	-	0
Stage 1	560	478	-	0	-	-	-	-	0
Stage 2	572	486	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	109	0	592	-	-	-	695	-	-
Mov Cap-2 Maneuver	109	0	-	-	-	-	-	-	-
Stage 1	560	0	-	-	-	-	-	-	-
Stage 2	476	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.3	0	2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	109	592	695	-
HCM Lane V/C Ratio	-	-	0.332	0.519	0.167	-
HCM Control Delay (s)	-	-	53.6	17.5	11.2	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	1.3	3	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	25	0	1292	768	5
Future Volume (vph)	6	25	0	1292	768	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1622	0	0	1734	1652	0
Flt Permitted	0.990					
Satd. Flow (perm)	1622	0	0	1734	1652	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	1436	859	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	78.0%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	0	1292	768	5
Future Vol, veh/h	6	25	0	1292	768	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	28	0	1436	853	6

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2292	856	859	0	-	0
Stage 1	856	-	-	-	-	-
Stage 2	1436	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	46	376	663	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	46	376	663	-	-	-
Mov Cap-2 Maneuver	46	-	-	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	239	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34.3	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	663	-	157	-	-
HCM Lane V/C Ratio	-	-	0.219	-	-
HCM Control Delay (s)	0	-	34.3	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	20	106	8	13	76	42	870	8	10	643	153
Future Volume (vph)	345	20	106	8	13	76	42	870	8	10	643	153
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1570	0	1391	1564	0	1500	1616	0	1628	1580	0
Flt Permitted	0.694			0.668			0.132			0.101		
Satd. Flow (perm)	1172	1570	0	977	1564	0	208	1616	0	173	1580	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		118			84			1			28	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	383	140	0	9	98	0	47	976	0	11	884	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.15	0.26		0.03	0.19		0.40	1.07		0.11	0.98	
Control Delay	123.0	7.2		18.6	7.4		16.0	63.3		10.5	42.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	123.0	7.2		18.6	7.4		16.0	63.3		10.5	42.4	
LOS	F	A		B	A		B	E		B	D	
Approach Delay		92.0			8.4			61.1			42.0	
Approach LOS		F			A			E			D	
Queue Length 50th (ft)	~198	7		3	4		6	~481		2	329	
Queue Length 95th (ft)	#354	45		13	36		m11	#690		10	#605	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	334	532		279	506		117	912		97	903	
Starvation Cap Reductn	0	0		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	1.15	0.26		0.03	0.19		0.40	1.07		0.11	0.98	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 58.5

Intersection LOS: E

Intersection Capacity Utilization 84.4%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

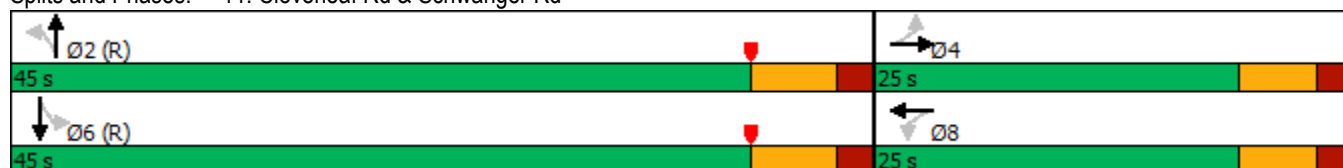
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2029 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	345	20	106	8	13	76	42	870	8	10	643	153
Future Volume (veh/h)	345	20	106	8	13	76	42	870	8	10	643	153
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	383	22	118	9	14	84	47	967	9	11	714	170
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	420	80	431	337	60	361	174	996	9	442	796	190
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1356	281	1509	1045	210	1263	604	1764	16	600	1411	336
Grp Volume(v), veh/h	383	0	140	9	0	98	47	0	976	11	0	884
Grp Sat Flow(s),veh/h/ln	1356	0	1791	1045	0	1473	604	0	1781	600	0	1746
Q Serve(g_s), s	16.4	0.0	4.3	0.5	0.0	3.6	5.0	0.0	0.0	0.6	0.0	31.3
Cycle Q Clear(g_c), s	20.0	0.0	4.3	4.8	0.0	3.6	36.3	0.0	0.0	0.6	0.0	31.3
Prop In Lane	1.00		0.84	1.00		0.86	1.00		0.01	1.00		0.19
Lane Grp Cap(c), veh/h	420	0	512	337	0	421	174	0	1005	442	0	985
V/C Ratio(X)	0.91	0.00	0.27	0.03	0.00	0.23	0.27	0.00	0.97	0.02	0.00	0.90
Avail Cap(c_a), veh/h	420	0	512	337	0	421	174	0	1005	442	0	985
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.63	0.00	0.63	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	19.7	21.2	0.0	19.5	14.4	0.0	0.0	6.8	0.0	13.5
Incr Delay (d2), s/veh	23.7	0.0	0.3	0.0	0.0	0.3	2.4	0.0	16.7	0.1	0.0	12.5
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(95%),veh/ln	13.9	0.0	3.1	0.2	0.0	2.1	1.1	0.0	7.5	0.1	0.0	18.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	0.0	20.0	21.3	0.0	19.8	16.8	0.0	16.7	6.9	0.0	26.1
LnGrp LOS	D	A	C	C	A	B	B	A	B	A	A	C
Approach Vol, veh/h	523			107			1023			895		
Approach Delay, s/veh	43.4			19.9			16.7			25.8		
Approach LOS	D			B			B			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			33.3			6.8		
Green Ext Time (p_c), s	30.9			0.0			4.8			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	25.5											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	9	2	884	7	25	710	7
Future Volume (vph)	36	0	17	17	1	9	2	884	7	25	710	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1686	0	0	1561	0	0	1614	1648
Flt Permitted		0.739			0.783			0.999			0.959	
Satd. Flow (perm)	0	1286	1581	0	1362	0	0	1560	0	0	1551	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		9			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	28	0	0	930	0	0	766	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.6			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.24	0.08		0.16			0.71			0.59	0.01
Control Delay		30.5	2.8		22.5			10.3			9.7	0.6
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		30.5	2.8		22.5			10.3			9.7	0.6
LOS		C	A		C			B			A	A
Approach Delay		21.6			22.5			10.3			9.6	
Approach LOS		C			C			B			A	
Queue Length 50th (ft)		15	0		7			193			252	0
Queue Length 95th (ft)		40	5		28			#566			m281	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		229	320		250			1301			1293	1380
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		0.17	0.06		0.11			0.71			0.59	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 10.6

Intersection LOS: B

Intersection Capacity Utilization 75.7%

ICU Level of Service D

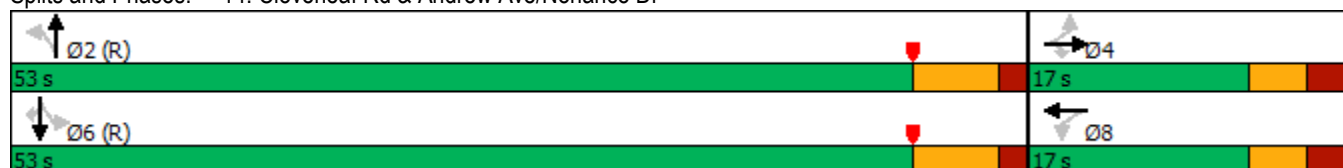
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	9	2	884	7	25	710	7
Future Volume (veh/h)	36	0	17	17	1	9	2	884	7	25	710	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	9	2	921	7	26	740	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	208	0	104	120	9	21	52	1295	10	73	1333	1319
Arrive On Green	0.05	0.00	0.07	0.05	0.07	0.05	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1599	0	1586	549	133	323	0	1621	12	25	1669	1652
Grp Volume(v), veh/h	38	0	18	28	0	0	930	0	0	766	0	7
Grp Sat Flow(s),veh/h/ln	1599	0	1586	1004	0	0	1634	0	0	1694	0	1652
Q Serve(g_s), s	0.0	0.0	0.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.8	2.4	0.0	0.0	19.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.64		0.32	0.00		0.01	0.03		1.00
Lane Grp Cap(c), veh/h	185	0	104	136	0	0	1333	0	0	1382	0	1319
V/C Ratio(X)	0.21	0.00	0.17	0.21	0.00	0.00	0.70	0.00	0.00	0.55	0.00	0.01
Avail Cap(c_a), veh/h	338	0	283	302	0	0	1333	0	0	1382	0	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.16	0.00	0.16
Uniform Delay (d), s/veh	31.7	0.0	30.9	32.4	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	0.7	0.0	0.0	3.0	0.0	0.0	0.3	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(95%),veh/ln	1.2	0.0	0.5	0.9	0.0	0.0	5.3	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	0.0	31.7	33.1	0.0	0.0	6.4	0.0	0.0	0.3	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56			28			930			773		
Approach Delay, s/veh	32.1			33.1			6.4			0.3		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	60.9			9.1			60.9			9.1		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	47.0			11.5			47.0			11.5		
Max Q Clear Time (g_c+I1), s	21.1			3.5			2.0			4.4		
Green Ext Time (p_c), s	21.7			0.1			28.3			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	5.0											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	246	38	52	243	204	74	380	51	109	216	191
Future Volume (vph)	283	246	38	52	243	204	74	380	51	109	216	191
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1684	0	1500	1509	1388
Flt Permitted	0.312			0.597			0.561			0.206		
Satd. Flow (perm)	488	1660	1088	749	1649	1561	967	1684	0	325	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		8				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	301	262	40	55	259	217	79	458	0	116	230	203
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	30.9	30.9	30.9	15.8	15.8	15.8	27.8	21.7		27.9	21.8	21.8
Actuated g/C Ratio	0.41	0.41	0.41	0.21	0.21	0.21	0.37	0.29		0.37	0.29	0.29
v/c Ratio	0.92	0.38	0.07	0.35	0.75	0.42	0.19	0.93		0.48	0.53	0.36
Control Delay	55.0	18.3	0.3	33.5	43.4	5.8	14.2	56.0		20.4	29.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.0	18.3	0.3	33.5	43.4	5.8	14.2	56.0		20.4	29.3	4.4
LOS	E	B	A	C	D	A	B	E		C	C	A
Approach Delay		35.4			27.0			49.8			18.2	
Approach LOS		D			C			D			B	
Queue Length 50th (ft)	108	89	0	23	120	0	21	219		32	96	0
Queue Length 95th (ft)	#265	148	0	57	#219	43	47	#419		66	170	36

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	328	738	566	181	400	559	431	493		247	438	567
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.92	0.36	0.07	0.30	0.65	0.39	0.18	0.93		0.47	0.53	0.36

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 75

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 32.6

Intersection LOS: C

Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø5	 Ø6	 Ø7	 Ø8
38.5 s	14 s	27.5 s	

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	283	246	38	52	243	204	74	380	51	109	216	191
Future Volume (veh/h)	283	246	38	52	243	204	74	380	51	109	216	191
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	301	262	27	55	259	0	79	404	52	116	230	173
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	367	684	482	249	332		412	475	61	288	449	398
Arrive On Green	0.13	0.40	0.40	0.19	0.19	0.00	0.06	0.26	0.25	0.09	0.29	0.29
Sat Flow, veh/h	1641	1709	1206	775	1724	1532	1988	1794	231	1522	1528	1352
Grp Volume(v), veh/h	301	262	27	55	259	0	79	0	456	116	230	173
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	775	1724	1532	1988	0	2025	1522	1528	1352
Q Serve(g_s), s	9.5	7.9	1.0	4.5	10.3	0.0	2.0	0.0	15.5	3.8	9.0	7.5
Cycle Q Clear(g_c), s	9.5	7.9	1.0	4.5	10.3	0.0	2.0	0.0	15.5	3.8	9.0	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	367	684	482	249	332		412	0	536	288	449	398
V/C Ratio(X)	0.82	0.38	0.06	0.22	0.78		0.19	0.00	0.85	0.40	0.51	0.44
Avail Cap(c_a), veh/h	367	780	550	292	429		505	0	602	314	454	402
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	15.4	13.3	25.4	27.7	0.0	17.3	0.0	25.3	17.9	21.2	20.7
Incr Delay (d2), s/veh	13.8	0.1	0.0	0.2	4.9	0.0	0.2	0.0	10.2	0.9	0.9	0.8
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(95%),veh/ln	8.4	4.8	0.4	1.4	7.7	0.0	1.6	0.0	13.5	2.3	5.5	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	15.5	13.3	25.5	32.7	0.0	17.5	0.0	35.5	18.9	22.2	21.4
LnGrp LOS	C	B	B	C	C		B	A	D	B	C	C
Approach Vol, veh/h	590				314			535			519	
Approach Delay, s/veh	25.1				31.4			32.9			21.2	
Approach LOS	C				C			C			C	
Timer - Assigned Phs	1	2	3	4	6		7	8				
Phs Duration (G+Y+Rc), s	15.0	19.4	12.7	25.2	34.4		10.6	27.3				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5		7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5	32.0		7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	12.8	6.3	17.5	10.4		4.5	11.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.1		0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	155	0	786	15	183	516	0
Future Volume (vph)	0	0	0	0	0	155	0	786	15	183	516	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1726	1567	1787	1745	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1726	1567	1787	1745	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	172	0	873	17	203	573	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 75.2%

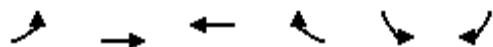
ICU Level of Service D

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2029 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↖	↗	↖	↗	
Traffic Vol, veh/h	0	0	0	0	0	155	0	786	15	183	516	0
Future Vol, veh/h	0	0	0	0	0	155	0	786	15	183	516	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	9	2	2	10	2
Mvmt Flow	0	0	0	0	0	172	0	873	17	203	573	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	573	-	-	873	573	0	0	890	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	0	519	0	0	349	1000	-	-	761	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	519	-	-	349	1000	-	-	761	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		25		0		3					
HCM LOS	A		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1000	-	-	-	349	761	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.493	0.267	-	-				
HCM Control Delay (s)	0	-	-	0	25	11.4	-	-				
HCM Lane LOS	A	-	-	A	D	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	2.6	1.1	-	-				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	113	294	399	51	65	141
Future Volume (vph)	113	294	399	51	65	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			225	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1805	1743	1810	1583	1664	0
Flt Permitted	0.950				0.985	
Satd. Flow (perm)	1805	1743	1810	1583	1664	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2697		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	9%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	126	327	443	57	229	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 49.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	113	294	399	51	65	141
Future Vol, veh/h	113	294	399	51	65	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	350	-	-	225	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	9	5	2	2	2
Mvmt Flow	126	327	443	57	72	157
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	500	0	-	0	1022	443
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	579	-
Critical Hdwy	4.5	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	785	-	-	-	288	650
Stage 1	-	-	-	-	737	-
Stage 2	-	-	-	-	633	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	785	-	-	-	242	650
Mov Cap-2 Maneuver	-	-	-	-	396	-
Stage 1	-	-	-	-	618	-
Stage 2	-	-	-	-	633	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.9	0		16.4		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	785	-	-	-	541	
HCM Lane V/C Ratio	0.16	-	-	-	0.423	
HCM Control Delay (s)	10.5	-	-	-	16.4	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0.6	-	-	-	2.1	

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2029 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	331	451	24	26	3
Future Volume (vph)	3	331	451	24	26	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1725	0	1554	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1725	0	1554	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	364	522	0	32	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.2% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	331	451	24	26	3
Future Vol, veh/h	3	331	451	24	26	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	364	496	26	29	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	522	0	0 879 509
Stage 1	-	-	- 509 -
Stage 2	-	-	- 370 -
Critical Hdwy	4.4	-	- 6.84 6.7
Critical Hdwy Stg 1	-	-	- 5.84 -
Critical Hdwy Stg 2	-	-	- 5.84 -
Follow-up Hdwy	3.3	-	- 3 3.4
Pot Cap-1 Maneuver	725	-	- 319 517
Stage 1	-	-	- 645 -
Stage 2	-	-	- 765 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	725	-	- 318 517
Mov Cap-2 Maneuver	-	-	- 462 -
Stage 1	-	-	- 642 -
Stage 2	-	-	- 765 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	725	-	-	-	467
HCM Lane V/C Ratio	0.005	-	-	-	0.068
HCM Control Delay (s)	10	-	-	-	13.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2029 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	23	34	6	44	123	47	345	9	32	193	79
Future Volume (vph)	71	23	34	6	44	123	47	345	9	32	193	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1300	0	0	1537	0	0	1665	0	0	1514	0
Flt Permitted		0.973			0.998			0.994			0.995	
Satd. Flow (perm)	0	1300	0	0	1537	0	0	1665	0	0	1514	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	180	0	0	417	0	0	316	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 56.6%

ICU Level of Service B

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	16.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	71	23	34	6	44	123	47	345	9	32	193	79
Future Vol, veh/h	71	23	34	6	44	123	47	345	9	32	193	79
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	74	24	35	6	46	128	49	359	9	33	201	82
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13	11.6	20	16
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	55%	3%	11%
Vol Thru, %	86%	18%	25%	63%
Vol Right, %	2%	27%	71%	26%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	401	128	173	304
LT Vol	47	71	6	32
Through Vol	345	23	44	193
RT Vol	9	34	123	79
Lane Flow Rate	418	133	180	317
Geometry Grp	1	1	1	1
Degree of Util (X)	0.67	0.27	0.302	0.533
Departure Headway (Hd)	5.777	7.302	6.041	6.159
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	618	495	598	589
Service Time	3.87	5.311	4.041	4.159
HCM Lane V/C Ratio	0.676	0.269	0.301	0.538
HCM Control Delay	20	13	11.6	16
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	5.1	1.1	1.3	3.1

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	721	88	212	556	126	141
Future Volume (vph)	721	88	212	556	126	141
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1801	0	1744	1958	1579	0
Flt Permitted			0.089		0.977	
Satd. Flow (perm)	1801	0	163	1958	1579	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	11					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	889	0	233	611	293	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	0.96		0.87	0.47	0.89	
Control Delay	42.6		39.5	7.3	60.5	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	42.6		39.5	7.3	60.5	
LOS	D		D	A	E	
Approach Delay	42.6			16.2	60.5	
Approach LOS	D			B	E	
Queue Length 50th (ft)	399		56	132	143	
Queue Length 95th (ft)	#672		m#105	m156	#283	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	923		268	1292	331	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.96		0.87	0.47	0.89	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 34.2	Intersection LOS: C
Intersection Capacity Utilization 86.6%	ICU Level of Service E
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	46 s	22 s
↖ Ø6 (R)		
58 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2029 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↰	↰	↰	
Traffic Volume (veh/h)	721	88	212	556	126	141
Future Volume (veh/h)	721	88	212	556	126	141
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	792	88	233	611	138	155
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	785	87	281	1383	162	182
Arrive On Green	0.51	0.50	0.20	1.00	0.21	0.20
Sat Flow, veh/h	1534	170	1914	2090	781	877
Grp Volume(v), veh/h	0	880	233	611	294	0
Grp Sat Flow(s),veh/h/ln	0	1704	1914	2090	1663	0
Q Serve(g_s), s	0.0	41.0	5.3	0.0	13.6	0.0
Cycle Q Clear(g_c), s	0.0	41.0	5.3	0.0	13.6	0.0
Prop In Lane		0.10	1.00		0.47	0.53
Lane Grp Cap(c), veh/h	0	873	281	1383	346	0
V/C Ratio(X)	0.00	1.01	0.83	0.44	0.85	0.00
Avail Cap(c_a), veh/h	0	873	281	1383	349	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	19.6	18.7	0.0	30.7	0.0
Incr Delay (d2), s/veh	0.0	32.6	18.2	1.0	20.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	29.6	5.9	0.7	11.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	52.2	36.9	1.0	51.6	0.0
LnGrp LOS	A	F	D	A	D	A
Approach Vol, veh/h	880			844	294	
Approach Delay, s/veh	52.2			10.9	51.6	
Approach LOS	D			B	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.0	46.2		21.8		58.2
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	7.3	43.0		15.6		2.0
Green Ext Time (p_c), s	0.0	0.0		0.0		19.8
Intersection Summary						
HCM 6th Ctrl Delay			34.8			
HCM 6th LOS			C			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	898	0	0	1049	95	1	0	2	36	0	49
Future Volume (vph)	28	898	0	0	1049	95	1	0	2	36	0	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	966	0	0	1230	0	0	3	0	39	53	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 72.9%

ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	898	0	0	1049	95	1	0	2	36	0	49
Future Vol, veh/h	28	898	0	0	1049	95	1	0	2	36	0	49
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	30	966	0	0	1128	102	1	0	2	39	0	53

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1230	0	0	966	0	0	2233	2256	966	2206	2205	1180
Stage 1	-	-	-	-	-	-	1026	1026	-	1179	1179	-
Stage 2	-	-	-	-	-	-	1207	1230	-	1027	1026	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	542	-	-	399	-	-	41	54	342	49	65	267
Stage 1	-	-	-	-	-	-	352	353	-	311	324	-
Stage 2	-	-	-	-	-	-	281	289	-	372	373	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	542	-	-	399	-	-	31	51	342	47	61	267
Mov Cap-2 Maneuver	-	-	-	-	-	-	31	51	-	47	61	-
Stage 1	-	-	-	-	-	-	333	334	-	294	324	-
Stage 2	-	-	-	-	-	-	225	289	-	349	352	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	52.5	103.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	79	542	-	-	399	-	-	47	267
HCM Lane V/C Ratio	0.041	0.056	-	-	-	-	-	0.824	0.197
HCM Control Delay (s)	52.5	12	-	-	0	-	-	215	21.8
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	3.3	0.7

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	702	38	155	849	18	275	3	119	24	8	17
Future Volume (vph)	15	702	38	155	849	18	275	3	119	24	8	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1742	0
Flt Permitted	0.246			0.131			0.740			0.676		
Satd. Flow (perm)	428	1766	1550	217	1697	1608	1314	1576	0	1253	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40			124			18
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	731	40	161	884	19	286	127	0	25	26	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.5	37.5	37.5	51.6	50.3	50.3	19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.64	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.08	0.88	0.05	0.57	0.83	0.02	0.92	0.27		0.08	0.06	
Control Delay	12.1	22.5	0.2	19.8	10.0	0.1	66.4	7.1		24.7	14.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	12.1	22.5	0.2	19.8	10.0	0.1	66.4	7.1		24.7	14.0	
LOS	B	C	A	B	B	A	E	A		C	B	
Approach Delay		21.2			11.3			48.2			19.2	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	3	156	0	12	27	0	140	1		10	3	
Queue Length 95th (ft)	m5	m220	m0	m54	#80	m0	#284	42		29	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	201	828	787	283	1066	1025	313	470		299	429	
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	0.08	0.88	0.05	0.57	0.83	0.02	0.91	0.27		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 21.4

Intersection LOS: C

Intersection Capacity Utilization 96.2%

ICU Level of Service F

Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	702	38	155	849	18	275	3	119	24	8	17
Future Volume (veh/h)	15	702	38	155	849	18	275	3	119	24	8	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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	16	731	25	161	884	16	286	3	84	25	8	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	425	997	856	541	1097	975	429	14	381	370	153	287
Arrive On Green	0.98	0.98	0.98	0.17	1.00	1.00	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	682	2032	1745	1666	1736	1542	1468	58	1627	1413	653	1224
Grp Volume(v), veh/h	16	731	25	161	884	16	286	0	87	25	0	23
Grp Sat Flow(s),veh/h/ln	682	2032	1745	1666	1736	1542	1468	0	1685	1413	0	1878
Q Serve(g_s), s	0.0	1.9	0.0	3.4	0.0	0.0	14.9	0.0	3.4	1.2	0.0	0.8
Cycle Q Clear(g_c), s	0.0	1.9	0.0	3.4	0.0	0.0	15.2	0.0	3.4	4.0	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.65
Lane Grp Cap(c), veh/h	425	997	856	541	1097	975	429	0	394	370	0	439
V/C Ratio(X)	0.04	0.73	0.03	0.30	0.81	0.02	0.67	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	425	997	856	576	1097	975	436	0	402	376	0	448
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(l)	1.00	1.00	1.00	0.63	0.63	0.63	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.4	0.4	0.4	6.3	0.0	0.0	29.4	0.0	25.2	26.2	0.0	24.0
Incr Delay (d2), s/veh	0.2	4.8	0.1	0.2	4.1	0.0	3.8	0.0	0.3	0.1	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(95%),veh/ln	0.0	2.8	0.0	1.6	2.2	0.0	9.4	0.0	2.5	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	5.2	0.4	6.5	4.1	0.0	33.2	0.0	25.4	26.3	0.0	24.1
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	772			1061			373			48		
Approach Delay, s/veh	4.9			4.4			31.4			25.2		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	11.3	45.1	23.6			56.4	23.6					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2	* 18					
Max Q Clear Time (g_c+I1), s	5.9	4.4	6.5			2.5	17.7					
Green Ext Time (p_c), s	0.1	0.9	0.1			1.1	0.1					

Intersection Summary

HCM 6th Ctrl Delay 9.5
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	526	1	10	854	75	9	2	1	43	3	115
Future Volume (vph)	87	526	1	10	854	75	9	2	1	43	3	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%				-1%
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.173			0.456				0.712		0.750		
Satd. Flow (perm)	305	1729	0	761	1818	1561	0	1347	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			121	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	555	0	11	899	79	0	12	0	45	124	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.9	64.1		55.3	55.3	55.3		9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.26	0.40		0.02	0.72	0.07		0.08		0.29	0.44	
Control Delay	3.8	6.8		4.3	12.9	0.4		29.9		36.2	12.1	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	3.8	6.8		4.3	13.1	0.4		29.9		36.2	12.1	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		6.4			12.0			29.9			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	9	161		1	357	0		5		21	1	
Queue Length 95th (ft)	m16	m253		m2	#608	m1		19		50	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	355	1384		525	1255	1112		226		227	352	
Starvation Cap Reductn	0	0		0	39	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	0.26	0.40		0.02	0.74	0.07		0.05		0.20	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 10.7

Intersection LOS: B

Intersection Capacity Utilization 72.5%

ICU Level of Service C

Analysis Period (min) 15

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.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary 10: Driveway/Market Sq Dr & SR 0230

2029 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	526	1	10	854	75	9	2	1	43	3	115
Future Volume (veh/h)	87	526	1	10	854	75	9	2	1	43	3	115
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	92	554	1	11	899	70	9	2	0	45	3	65
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	540	1338	2	658	1333	1138	113	19	0	210	5	115
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.07	0.08	0.00	0.08	0.08	0.07
Sat Flow, veh/h	1629	1679	3	825	1935	1652	396	245	0	1376	68	1476
Grp Volume(v), veh/h	92	0	555	11	899	70	11	0	0	45	0	68
Grp Sat Flow(s),veh/h/ln	1629	0	1682	825	1935	1652	641	0	0	1376	0	1544
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	2.0	0.0	3.4
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.96
Lane Grp Cap(c), veh/h	540	0	1341	658	1333	1138	124	0	0	210	0	120
V/C Ratio(X)	0.17	0.00	0.41	0.02	0.67	0.06	0.09	0.00	0.00	0.21	0.00	0.57
Avail Cap(c_a), veh/h	588	0	1341	658	1333	1138	249	0	0	334	0	259
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)	0.40	0.00	0.40	0.66	0.66	0.66	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.7	0.0	0.0	34.9	0.0	36.0
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.8	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.2	0.0	0.4	0.0	0.0	1.5	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.0	0.4	0.0	1.8	0.1	35.0	0.0	0.0	35.4	0.0	40.2
LnGrp LOS	A	A	A	A	A	A	C	A	A	D	A	D
Approach Vol, veh/h	647			980			11			113		
Approach Delay, s/veh	0.6			1.7			35.0			38.3		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.7	60.5		10.8		69.2		10.8				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.6	2.5		5.4		2.5		5.4				
Green Ext Time (p_c), s	0.0	1.3		0.2		0.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				3.9								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	473	22	42	740	33	94	36	30	34	45	96
Future Volume (vph)	63	473	22	42	740	33	94	36	30	34	45	96
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1710	0	1573	1679	0	1572	1603	0	0	1801	0
Flt Permitted	0.263			0.430			0.514				0.921	
Satd. Flow (perm)	457	1710	0	712	1679	0	850	1603	0	0	1675	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			4			32			83	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	521	0	44	814	0	99	70	0	0	184	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	56.0	56.0		56.0	56.0		14.1	14.1			14.1	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.18	0.18			0.18	
v/c Ratio	0.21	0.43		0.09	0.69		0.66	0.23			0.51	
Control Delay	2.0	1.7		5.7	12.4		50.5	17.8			20.4	
Queue Delay	0.0	0.0		0.0	0.2		0.0	0.0			0.0	
Total Delay	2.0	1.7		5.7	12.6		50.5	17.8			20.4	
LOS	A	A		A	B		D	B			C	
Approach Delay		1.7			12.2			37.0			20.4	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	1	8		6	196		47	16			45	
Queue Length 95th (ft)	2	10		21	438		89	45			94	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	319	1198		498	1176		286	562			620	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	48		0	0			2	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.21	0.43		0.09	0.72		0.35	0.12			0.30	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 12.0

Intersection LOS: B

Intersection Capacity Utilization 83.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)		 Ø4
48 s		32 s
 Ø6 (R)		 Ø8
48 s		32 s

HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2029 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	473	22	42	740	33	94	36	30	34	45	96
Future Volume (veh/h)	63	473	22	42	740	33	94	36	30	34	45	96
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	66	498	22	44	779	33	99	38	14	36	47	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	424	1198	53	740	1334	57	235	164	60	93	84	118
Arrive On Green	1.00	1.00	1.00	0.74	0.74	0.73	0.14	0.14	0.13	0.13	0.14	0.13
Sat Flow, veh/h	619	1623	72	881	1807	77	1180	1189	438	272	611	851
Grp Volume(v), veh/h	66	0	520	44	0	812	99	0	52	163	0	0
Grp Sat Flow(s),veh/h/ln	619	0	1695	881	0	1884	1180	0	1627	1735	0	0
Q Serve(g_s), s	2.7	0.0	0.0	1.1	0.0	15.9	0.4	0.0	2.3	4.4	0.0	0.0
Cycle Q Clear(g_c), s	18.6	0.0	0.0	1.1	0.0	15.9	7.6	0.0	2.3	7.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.04	1.00		0.27	0.22		0.49
Lane Grp Cap(c), veh/h	424	0	1251	740	0	1390	235	0	225	273	0	0
V/C Ratio(X)	0.16	0.00	0.42	0.06	0.00	0.58	0.42	0.00	0.23	0.60	0.00	0.00
Avail Cap(c_a), veh/h	424	0	1251	740	0	1390	471	0	549	611	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(l)	0.93	0.00	0.93	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.5	0.0	0.0	2.9	0.0	4.8	33.0	0.0	30.8	33.1	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.9	0.2	0.0	1.8	1.2	0.0	0.5	2.1	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(95%),veh/ln	0.4	0.0	0.6	0.3	0.0	7.6	3.3	0.0	1.6	5.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.2	0.0	0.9	3.0	0.0	6.6	34.2	0.0	31.3	35.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	586			856			151			163		
Approach Delay, s/veh	1.2			6.4			33.2			35.2		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	64.0			16.0			64.0			16.0		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			9.2			17.9			9.6		
Green Ext Time (p_c), s	16.1			0.5			18.8			0.4		

Intersection Summary

HCM 6th Ctrl Delay 9.7
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	650	0	125	335	168	0	0	252	48
Future Volume (vph)	0	0	0	650	0	125	335	168	0	0	252	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.362					
Satd. Flow (perm)	0	0	0	0	1653	1414	605	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	684	132	353	177	0	0	265	51
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.5	25.5	29.1	29.1			16.1	16.1
Actuated g/C Ratio					0.40	0.40	0.45	0.45			0.25	0.25
v/c Ratio					1.04	0.20	0.89	0.26			0.64	0.10
Control Delay					69.5	3.0	41.6	12.0			29.2	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					69.5	3.0	41.6	12.0			29.2	0.4
LOS					E	A	D	B			C	A
Approach Delay					58.7			31.7			24.6	
Approach LOS					E			C			C	
Queue Length 50th (ft)					~305	0	92	40			92	0
Queue Length 95th (ft)					#492	24	#228	77			163	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					657	653	397	707			439	539
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					1.04	0.20	0.89	0.25			0.60	0.09

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 64.1

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 43.6

Intersection LOS: D

Intersection Capacity Utilization 141.7%

ICU Level of Service H

Analysis Period (min) 15

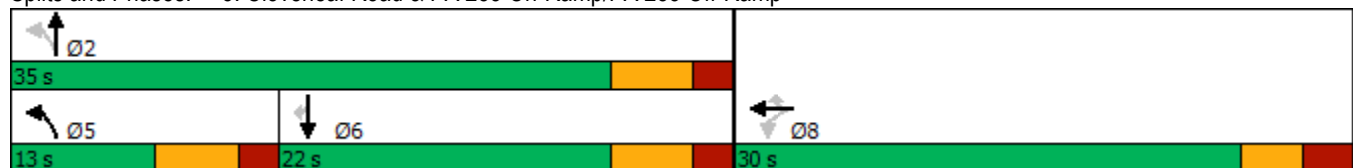
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	650	0	125	335	168	0	0	252	48
Future Volume (veh/h)	0	0	0	650	0	125	335	168	0	0	252	48
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				684	0	0	353	177	0	0	265	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				741	0		418	679	0	0	388	
Arrive On Green				0.40	0.00	0.00	0.13	0.43	0.00	0.00	0.22	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				684	0	0	353	177	0	0	265	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				22.3	0.0	0.0	8.0	4.4	0.0	0.0	8.3	0.0
Cycle Q Clear(g_c), s				22.3	0.0	0.0	8.0	4.4	0.0	0.0	8.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				741	0		418	679	0	0	388	
V/C Ratio(X)				0.92	0.00		0.85	0.26	0.00	0.00	0.68	
Avail Cap(c_a), veh/h				744	0		418	775	0	0	497	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.5	0.0	0.0	18.2	11.2	0.0	0.0	22.0	0.0
Incr Delay (d2), s/veh				17.1	0.0	0.0	14.7	0.7	0.0	0.0	7.6	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
%ile BackOfQ(95%),veh/ln				17.4	0.0	0.0	8.6	2.5	0.0	0.0	7.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				34.5	0.0	0.0	32.9	11.9	0.0	0.0	29.6	0.0
LnGrp LOS				C	A		C	B	A	A	C	
Approach Vol, veh/h					684			530			265	
Approach Delay, s/veh					34.5			25.9			29.6	
Approach LOS					C			C			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	31.3			13.0			18.3			29.9		
Change Period (Y+Rc), s	6.0			6.0			6.0			5.5		
Max Green Setting (Gmax), s	29.0			7.0			16.0			24.5		
Max Q Clear Time (g_c+I1), s	6.4			10.0			10.3			24.3		
Green Ext Time (p_c), s	3.5			0.0			2.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay			30.5									
HCM 6th LOS			C									
Notes												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	3	557	0	0	0	0	463	521	100	810	0
Future Volume (vph)	44	3	557	0	0	0	0	463	521	100	810	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1563	1569	0	0	0	0	1666	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1563	1569	0	0	0	0	1666	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	574	0	0	0	0	1014	0	103	835	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 141.7%

ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2029 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	49.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	44	3	557	0	0	0	0	463	521	100	810	0
Future Vol, veh/h	44	3	557	0	0	0	0	463	521	100	810	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	45	3	574	0	0	0	0	477	537	103	835	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1518	1518	835	-	0	0	477	0	0
Stage 1	1041	1041	-	-	-	-	-	-	-
Stage 2	477	477	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	122	155 ~ 413		0	-	-	834	-	0
Stage 1	407	368	-	0	-	-	-	-	0
Stage 2	713	606	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	107	0 ~ 413		-	-	-	834	-	-
Mov Cap-2 Maneuver	107	0	-	-	-	-	-	-	-
Stage 1	407	0	-	-	-	-	-	-	-
Stage 2	625	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	204.4	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	107	413	834	-
HCM Lane V/C Ratio	-	-	0.453	1.39	0.124	-
HCM Control Delay (s)	-	-	63.9	216.3	9.9	-
HCM Lane LOS	-	-	F	F	A	-
HCM 95th %tile Q(veh)	-	-	2	27.9	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	969	1339	10
Future Volume (vph)	3	9	8	969	1339	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1801	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	1007	1390	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	81.1%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	969	1339	10
Future Vol, veh/h	3	9	8	969	1339	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	999	1380	10

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2400	1385	1390	0	-	0
Stage 1	1385	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	39	183	449	-	-	-
Stage 1	253	-	-	-	-	-
Stage 2	388	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	37	183	449	-	-	-
Mov Cap-2 Maneuver	37	-	-	-	-	-
Stage 1	243	-	-	-	-	-
Stage 2	388	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	50.1	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	449	-	92	-	-
HCM Lane V/C Ratio	0.018	-	0.134	-	-
HCM Control Delay (s)	13.2	0	50.1	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	34	97	9	42	36	79	723	14	50	975	327
Future Volume (vph)	224	34	97	9	42	36	79	723	14	50	975	327
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1670	0	1416	1704	0	1620	1694	0	1628	1678	0
Flt Permitted	0.704			0.669			0.107			0.257		
Satd. Flow (perm)	1200	1670	0	997	1704	0	182	1694	0	440	1678	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		102			38			3			54	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	236	138	0	9	82	0	83	776	0	53	1370	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	0.98	0.33		0.05	0.22		0.73	0.73		0.19	1.28	
Control Delay	83.8	10.4		20.2	14.4		44.5	15.5		6.9	151.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	83.8	10.4		20.2	14.4		44.5	15.5		6.9	151.0	
LOS	F	B		C	B		D	B		A	F	
Approach Delay		56.7			14.9			18.3			145.6	
Approach LOS		E			B			B			F	
Queue Length 50th (ft)	86	11		3	13		38	356		7	~650	
Queue Length 95th (ft)	#209	51		13	44		m#61	364		21	#882	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	415		199	371		113	1059		275	1069	
Starvation Cap Reductn	0	0		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	0.98	0.33		0.05	0.22		0.73	0.73		0.19	1.28	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.28

Intersection Signal Delay: 89.4

Intersection LOS: F

Intersection Capacity Utilization 103.7%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2029 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	34	97	9	42	36	79	723	14	50	975	327
Future Volume (veh/h)	224	34	97	9	42	36	79	723	14	50	975	327
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	236	36	78	9	44	24	83	761	14	53	1026	333
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	354	116	252	280	221	121	120	1135	21	293	868	282
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1406	581	1258	1091	1107	604	409	1815	33	725	1389	451
Grp Volume(v), veh/h	236	0	114	9	0	68	83	0	775	53	0	1359
Grp Sat Flow(s),veh/h/ln	1406	0	1839	1091	0	1711	409	0	1849	725	0	1839
Q Serve(g_s), s	10.0	0.0	3.2	0.4	0.0	2.0	0.0	0.0	23.2	3.6	0.0	37.5
Cycle Q Clear(g_c), s	12.0	0.0	3.2	3.6	0.0	2.0	37.5	0.0	23.2	26.8	0.0	37.5
Prop In Lane	1.00		0.68	1.00		0.35	1.00		0.02	1.00		0.25
Lane Grp Cap(c), veh/h	354	0	368	280	0	342	120	0	1156	293	0	1150
V/C Ratio(X)	0.67	0.00	0.31	0.03	0.00	0.20	0.69	0.00	0.67	0.18	0.00	1.18
Avail Cap(c_a), veh/h	354	0	368	280	0	342	120	0	1156	293	0	1150
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.0	0.0	20.8	22.0	0.0	20.1	42.6	0.0	18.1	18.8	0.0	11.4
Incr Delay (d2), s/veh	4.7	0.0	0.5	0.0	0.0	0.3	19.5	0.0	2.1	1.3	0.0	91.1
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(95%),veh/ln	6.3	0.0	2.4	0.2	0.0	1.4	3.5	0.0	16.1	1.2	0.0	55.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	0.0	21.2	22.1	0.0	20.4	62.0	0.0	20.2	20.1	0.0	102.5
LnGrp LOS	C	A	C	C	A	C	E	A	C	C	A	F
Approach Vol, veh/h	350			77			858			1412		
Approach Delay, s/veh	27.0			20.6			24.2			99.4		
Approach LOS	C			C			C			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	25.2			14.0			39.5			5.6		
Green Ext Time (p_c), s	9.3			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	63.8											
HCM 6th LOS	E											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	63	0	40	17	762	5	10	1036	35
Future Volume (vph)	15	0	18	63	0	40	17	762	5	10	1036	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1670	0	0	1639	0	0	1723	1648
Flt Permitted		0.762			0.804			0.970			0.992	
Satd. Flow (perm)	0	1326	1581	0	1384	0	0	1592	0	0	1709	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	108	0	0	825	0	0	1102	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.7			45.0			45.0	45.0
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.08	0.07		0.44			0.69			0.86	0.03
Control Delay		22.1	1.7		18.8			9.3			7.5	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		22.1	1.7		18.8			9.3			7.5	0.1
LOS		C	A		B			A			A	A
Approach Delay		11.0			18.8			9.3			7.3	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		17			161			24	0
Queue Length 95th (ft)		19	4		55			289			m30	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		232	322		287			1195			1283	1248
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		0.07	0.06		0.38			0.69			0.86	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 83.5%

ICU Level of Service E

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	63	0	40	17	762	5	10	1036	35
Future Volume (veh/h)	15	0	18	63	0	40	17	762	5	10	1036	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	66	0	27	18	802	5	11	1091	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	290	0	168	201	4	42	71	1211	7	64	1349	1216
Arrive On Green	0.09	0.00	0.11	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1607	0	1586	931	33	395	13	1646	10	5	1832	1652
Grp Volume(v), veh/h	16	0	11	93	0	0	825	0	0	1102	0	36
Grp Sat Flow(s),veh/h/ln	1607	0	1586	1360	0	0	1669	0	0	1837	0	1652
Q Serve(g_s), s	0.0	0.0	0.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.4	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.71		0.29	0.02		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	263	0	168	223	0	0	1262	0	0	1382	0	1216
V/C Ratio(X)	0.06	0.00	0.07	0.42	0.00	0.00	0.65	0.00	0.00	0.80	0.00	0.03
Avail Cap(c_a), veh/h	355	0	278	324	0	0	1262	0	0	1382	0	1216
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	24.7	0.0	24.2	26.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.2	0.0	0.0	2.6	0.0	0.0	0.5	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(95%),veh/ln	0.4	0.0	0.3	2.4	0.0	0.0	1.7	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	24.3	27.7	0.0	0.0	2.6	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	27			93			825			1138		
Approach Delay, s/veh	24.6			27.7			2.6			0.4		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.2			10.8			49.2			10.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.5			2.0			6.1		
Green Ext Time (p_c), s	26.5			0.0			33.5			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	2.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	237	348	60	135	458	136	96	297	61	223	303	222
Future Volume (vph)	237	348	60	135	458	136	96	297	61	223	303	222
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1781	0	1604	1640	1442
Flt Permitted	0.140			0.547			0.451			0.202		
Satd. Flow (perm)	234	1791	1435	871	1697	1577	723	1781	0	341	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159			8			229
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	244	359	62	139	472	140	99	369	0	230	312	229
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	58.1	58.1	58.1	36.1	36.1	36.1	39.1	30.4		49.6	35.7	35.7
Actuated g/C Ratio	0.48	0.48	0.48	0.30	0.30	0.30	0.33	0.25		0.41	0.30	0.30
v/c Ratio	0.82	0.41	0.08	0.53	0.93	0.24	0.34	0.81		0.80	0.64	0.39
Control Delay	44.9	20.9	1.0	42.3	65.9	4.1	27.4	57.4		37.6	36.1	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	44.9	20.9	1.0	42.3	65.9	4.1	27.4	57.4		37.6	36.1	7.1
LOS	D	C	A	D	E	A	C	E		D	D	A
Approach Delay		27.9			50.0			51.0			27.9	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	109	164	0	87	343	0	49	275		108	192	27
Queue Length 95th (ft)	#230	233	7	153	#519	34	90	#468		m146	m252	m41
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	310	932	795	286	558	625	297	457		288	487	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.79	0.39	0.08	0.49	0.85	0.22	0.33	0.81		0.80	0.64	0.39

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 38.2

Intersection LOS: D

Intersection Capacity Utilization 91.9%

ICU Level of Service F

Analysis Period (min) 15

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4 (R)
23 s	45 s	20 s	32 s
 Ø6	 Ø7	 Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	348	60	135	458	136	96	297	61	223	303	222
Future Volume (veh/h)	237	348	60	135	458	136	96	297	61	223	303	222
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	244	359	32	139	472	0	99	306	62	230	312	158
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	302	837	715	325	511		351	484	98	367	548	464
Arrive On Green	0.12	0.46	0.46	0.29	0.29	0.00	0.06	0.28	0.27	0.12	0.33	0.33
Sat Flow, veh/h	1736	1823	1557	915	1766	1544	1880	1740	353	1616	1655	1402
Grp Volume(v), veh/h	244	359	32	139	472	0	99	0	368	230	312	158
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	915	1766	1544	1880	0	2093	1616	1655	1402
Q Serve(g_s), s	11.1	15.9	1.4	15.3	31.1	0.0	4.4	0.0	18.5	11.6	18.7	10.2
Cycle Q Clear(g_c), s	11.1	15.9	1.4	15.3	31.1	0.0	4.4	0.0	18.5	11.6	18.7	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	302	837	715	325	511		351	0	583	367	548	464
V/C Ratio(X)	0.81	0.43	0.04	0.43	0.92		0.28	0.00	0.63	0.63	0.57	0.34
Avail Cap(c_a), veh/h	340	950	811	361	581		372	0	583	367	548	464
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.9	21.9	17.9	35.7	41.4	0.0	28.1	0.0	38.0	26.2	33.1	30.2
Incr Delay (d2), s/veh	12.2	0.1	0.0	0.3	18.2	0.0	0.4	0.0	5.1	3.4	4.3	2.0
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(95%),veh/ln	9.1	10.7	0.9	6.0	22.0	0.0	3.7	0.0	15.7	8.2	12.6	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.1	22.0	17.9	36.1	59.6	0.0	28.5	0.0	43.1	29.6	37.3	32.2
LnGrp LOS	D	C	B	D	E		C	A	D	C	D	C
Approach Vol, veh/h	635			611			467			700		
Approach Delay, s/veh	28.7			54.2			40.0			33.6		
Approach LOS	C			D			D			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.4	40.2	20.0	39.4		60.6	13.7	45.7				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	13.6	33.6	14.1	20.5		18.4	6.9	21.2				
Green Ext Time (p_c), s	0.3	0.1	0.0	0.7		0.1	0.0	1.7				

Intersection Summary

HCM 6th Ctrl Delay	38.8
HCM 6th LOS	D

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	256	0	566	71	282	755	0
Future Volume (vph)	0	0	0	0	0	256	0	566	71	282	755	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1809	1567	1787	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1809	1567	1787	1863	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	278	0	615	77	307	821	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 76.2%

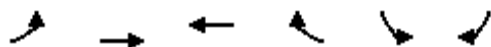
ICU Level of Service D

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2029 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↖	↗	↖	↗	
Traffic Vol, veh/h	0	0	0	0	0	256	0	566	71	282	755	0
Future Vol, veh/h	0	0	0	0	0	256	0	566	71	282	755	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	4	2	2	3	2
Mvmt Flow	0	0	0	0	0	278	0	615	77	307	821	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	821	-	-	615	821	0	0	692	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	374	0	0	517	808	-	-	746	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	374	-	-	517	808	-	-	746	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		19.8		0		3.6					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	808	-	-	-	517	746	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.538	0.411	-	-				
HCM Control Delay (s)	0	-	-	0	19.8	13.2	-	-				
HCM Lane LOS	A	-	-	A	C	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	3.2	2	-	-				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	169	462	461	77	150	326
Future Volume (vph)	169	462	461	77	150	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			225	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	1881	1845	1583	1664	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1770	1881	1845	1583	1664	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	3%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	513	512	86	529	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 72.0% ICU Level of Service C

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	44.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	169	462	461	77	150	326
Future Vol, veh/h	169	462	461	77	150	326
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	350	-	-	225	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	1	3	2	2	2
Mvmt Flow	188	513	512	86	167	362
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	598	0	-	0	1401	512
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	889	-
Critical Hdwy	4.5	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	722	-	-	-	167	593
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	446	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	722	-	-	- ~	124	593
Mov Cap-2 Maneuver	-	-	-	-	272	-
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	446	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.1	0		148.3		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	722	-	-	-	432	
HCM Lane V/C Ratio	0.26	-	-	-	1.224	
HCM Control Delay (s)	11.7	-	-	-	148.3	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	1	-	-	-	21.4	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2029 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	566	492	57	39	1
Future Volume (vph)	6	566	492	57	39	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1767	0	1668	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1767	0	1668	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	590	572	0	42	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 39.8% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	566	492	57	39	1
Future Vol, veh/h	6	566	492	57	39	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	590	513	59	41	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	572	0	-	0	1145	543
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	602	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	786	-	-	-	214	554
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	786	-	-	-	212	554
Mov Cap-2 Maneuver	-	-	-	-	369	-
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	579	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		15.9		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	786	-	-	-	372	
HCM Lane V/C Ratio	0.008	-	-	-	0.112	
HCM Control Delay (s)	9.6	-	-	-	15.9	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2029 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	83	78	4	52	66	33	301	6	98	358	55
Future Volume (vph)	86	83	78	4	52	66	33	301	6	98	358	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1388	0	0	1568	0	0	1670	0	0	1572	0
Flt Permitted		0.983			0.998			0.995			0.991	
Satd. Flow (perm)	0	1388	0	0	1568	0	0	1670	0	0	1572	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	257	0	0	127	0	0	354	0	0	532	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	74.4%											
Analysis Period (min)	15											
ICU Level of Service D												

Intersection	
Intersection Delay, s/veh	40.3
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	86	83	78	4	52	66	33	301	6	98	358	55
Future Vol, veh/h	86	83	78	4	52	66	33	301	6	98	358	55
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	90	86	81	4	54	69	34	314	6	102	373	57
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	21.1	13.4	24.1	66.8
HCM LOS	C	B	C	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	35%	3%	19%
Vol Thru, %	89%	34%	43%	70%
Vol Right, %	2%	32%	54%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	340	247	122	511
LT Vol	33	86	4	98
Through Vol	301	83	52	358
RT Vol	6	78	66	55
Lane Flow Rate	354	257	127	532
Geometry Grp	1	1	1	1
Degree of Util (X)	0.685	0.568	0.266	1.005
Departure Headway (Hd)	7.067	8.049	7.674	6.794
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	514	450	471	532
Service Time	5.067	6.049	5.674	4.879
HCM Lane V/C Ratio	0.689	0.571	0.27	1
HCM Control Delay	24.1	21.1	13.4	66.8
HCM Lane LOS	C	C	B	F
HCM 95th-tile Q	5.2	3.5	1.1	14.2

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 Build
SAT Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	691	84	150	596	91	146
Future Volume (vph)	691	84	150	596	91	146
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1837	0	1761	1958	1571	0
Flt Permitted			0.162		0.981	
Satd. Flow (perm)	1837	0	300	1958	1571	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	7					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	783	0	152	602	239	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	60.9		75.0	73.8	25.8	
Actuated g/C Ratio	0.55		0.68	0.67	0.23	
v/c Ratio	0.77		0.47	0.46	0.65	
Control Delay	26.7		10.3	10.8	45.7	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	26.7		10.3	10.8	45.7	
LOS	C		B	B	D	
Approach Delay	26.7			10.7	45.7	
Approach LOS	C			B	D	
Queue Length 50th (ft)	406		36	210	153	
Queue Length 95th (ft)	#729		m62	m320	217	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2029 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1020		324	1312	568	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.77		0.47	0.46	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 22.5

Intersection LOS: C

Intersection Capacity Utilization 79.3%

ICU Level of Service D

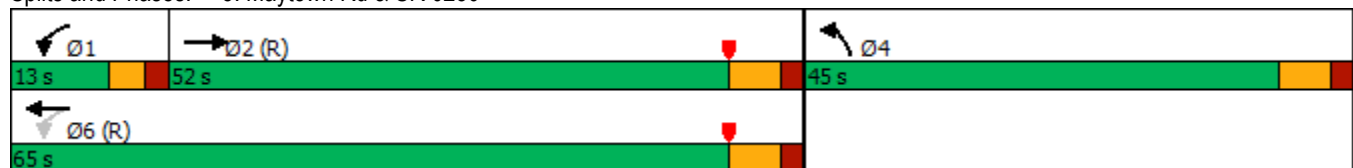
Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary 3: Maytown Rd & SR 0230

2029 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	691	84	150	596	91	146
Future Volume (veh/h)	691	84	150	596	91	146
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	698	83	152	602	92	147
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	971	115	410	1501	119	191
Arrive On Green	0.63	0.62	0.04	0.48	0.19	0.18
Sat Flow, veh/h	1547	184	1927	2090	636	1017
Grp Volume(v), veh/h	0	781	152	602	240	0
Grp Sat Flow(s),veh/h/ln	0	1731	1927	2090	1660	0
Q Serve(g_s), s	0.0	33.7	2.8	20.4	15.1	0.0
Cycle Q Clear(g_c), s	0.0	33.7	2.8	20.4	15.1	0.0
Prop In Lane		0.11	1.00		0.38	0.61
Lane Grp Cap(c), veh/h	0	1087	410	1501	311	0
V/C Ratio(X)	0.00	0.72	0.37	0.40	0.77	0.00
Avail Cap(c_a), veh/h	0	1087	464	1501	601	0
HCM Platoon Ratio	1.00	1.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.9	12.9	13.3	42.8	0.0
Incr Delay (d2), s/veh	0.0	4.1	0.6	0.8	13.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	19.0	2.5	16.0	11.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.0	13.5	14.1	56.3	0.0
LnGrp LOS	A	B	B	B	E	A
Approach Vol, veh/h	781			754	240	
Approach Delay, s/veh	18.0			14.0	56.3	
Approach LOS	B			B	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.0	74.2		25.8		84.2
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	4.8	35.7		17.1		22.4
Green Ext Time (p_c), s	0.1	8.0		2.5		16.6
Intersection Summary						
HCM 6th Ctrl Delay			21.5			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	898	0	1	914	112	0	0	1	58	0	36
Future Volume (vph)	17	898	0	1	914	112	0	0	1	58	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	935	0	1	1069	0	0	1	0	60	38	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 71.4% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	898	0	1	914	112	0	0	1	58	0	36
Future Vol, veh/h	17	898	0	1	914	112	0	0	1	58	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	935	0	1	952	117	0	0	1	60	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1069	0	0	935	0	0	2003	2042	935	1985	1984	1011
Stage 1	-	-	-	-	-	-	971	971	-	1013	1013	-
Stage 2	-	-	-	-	-	-	1032	1071	-	972	971	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	604	-	-	414	-	-	59	72	356	68	86	332
Stage 1	-	-	-	-	-	-	376	372	-	378	378	-
Stage 2	-	-	-	-	-	-	349	338	-	397	392	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	604	-	-	414	-	-	51	70	356	66	83	332
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	70	-	66	83	-
Stage 1	-	-	-	-	-	-	365	361	-	367	377	-
Stage 2	-	-	-	-	-	-	309	337	-	384	380	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	15.1	124.8
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	356	604	-	-	414	-	-	66	332
HCM Lane V/C Ratio	0.003	0.029	-	-	0.003	-	-	0.915	0.113
HCM Control Delay (s)	15.1	11.1	-	-	13.7	-	-	191.6	17.2
HCM Lane LOS	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	4.4	0.4

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	666	50	156	759	16	262	3	164	35	4	15
Future Volume (vph)	22	666	50	156	759	16	262	3	164	35	4	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1740	0
Flt Permitted	0.318			0.200			0.744			0.536		
Satd. Flow (perm)	553	1783	1584	331	1697	1573	1327	1574	0	994	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			173			16
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	701	53	164	799	17	276	176	0	37	20	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	58.6	58.6	58.6	75.4	74.1	74.1	25.2	25.2		25.2	25.2	
Actuated g/C Ratio	0.53	0.53	0.53	0.69	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.08	0.74	0.06	0.47	0.70	0.02	0.91	0.36		0.16	0.05	
Control Delay	16.1	21.7	2.9	12.3	11.3	1.8	75.1	7.6		35.6	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	16.1	21.7	2.9	12.3	11.3	1.8	75.1	7.6		35.6	16.9	
LOS	B	C	A	B	B	A	E	A		D	B	
Approach Delay		20.3			11.3			48.8			29.0	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	6	202	0	27	174	0	189	2		21	2	
Queue Length 95th (ft)	m15	376	m5	m87	297	m1	#341	57		50	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	294	949	882	424	1143	1068	314	505		235	425	
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	0.08	0.74	0.06	0.39	0.70	0.02	0.88	0.35		0.16	0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 22.3

Intersection LOS: C

Intersection Capacity Utilization 91.2%

ICU Level of Service F

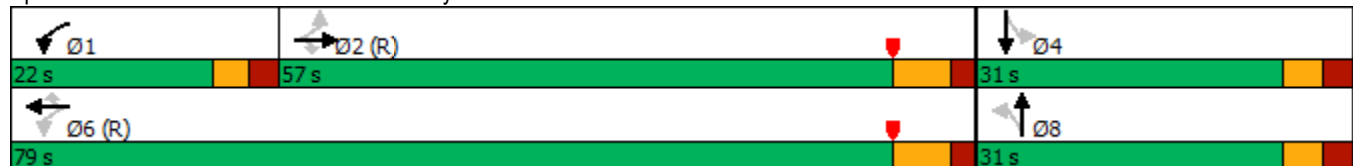
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2029 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	666	50	156	759	16	262	3	164	35	4	15
Future Volume (veh/h)	22	666	50	156	759	16	262	3	164	35	4	15
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	701	31	164	799	12	276	3	108	37	4	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	491	1176	1002	574	1193	1058	385	10	354	294	124	279
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.22	0.22	0.21	0.22	0.22	0.21
Sat Flow, veh/h	741	2047	1743	1666	1736	1540	1488	46	1645	1387	576	1296
Grp Volume(v), veh/h	23	701	31	164	799	12	276	0	111	37	0	13
Grp Sat Flow(s),veh/h/ln	741	2047	1743	1666	1736	1540	1488	0	1690	1387	0	1871
Q Serve(g_s), s	0.0	0.0	0.0	4.1	0.0	0.0	19.7	0.0	6.1	2.5	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.1	0.0	0.0	19.8	0.0	6.1	8.1	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.69
Lane Grp Cap(c), veh/h	491	1176	1002	574	1193	1058	385	0	364	294	0	403
V/C Ratio(X)	0.05	0.60	0.03	0.29	0.67	0.01	0.72	0.00	0.30	0.13	0.00	0.03
Avail Cap(c_a), veh/h	491	1176	1002	720	1193	1058	417	0	401	324	0	444
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)	1.00	1.00	1.00	0.72	0.72	0.72	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.2	0.0	0.0	41.7	0.0	36.7	39.4	0.0	34.4
Incr Delay (d2), s/veh	0.2	2.2	0.1	0.2	2.2	0.0	5.4	0.0	0.5	0.2	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(95%),veh/ln	0.0	1.3	0.0	2.1	1.3	0.0	12.4	0.0	4.7	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	2.2	0.1	6.4	2.2	0.0	47.0	0.0	37.1	39.6	0.0	34.4
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	755			975			387			50		
Approach Delay, s/veh	2.1			2.9			44.2			38.3		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	12.4	69.0	28.6		81.4		28.6					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25		72.2		* 25					
Max Q Clear Time (g_c+I1), s	6.6	2.5	10.6		2.5		22.3					
Green Ext Time (p_c), s	0.3	0.9	0.1		1.0		0.4					

Intersection Summary

HCM 6th Ctrl Delay 10.8
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	611	13	4	741	68	9	3	10	63	40	130
Future Volume (vph)	109	611	13	4	741	68	9	3	10	63	40	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1742	0	1744	1818	1561	0	1765	0	1719	1574	0
Flt Permitted	0.242			0.410				0.601		0.742		
Satd. Flow (perm)	427	1742	0	753	1818	1561	0	1082	0	1342	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				80		11			135	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	671	0	4	797	73	0	24	0	68	183	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.7	87.8		75.2	75.2	75.2		12.2		12.2	12.2	
Actuated g/C Ratio	0.81	0.80		0.68	0.68	0.68		0.11		0.11	0.11	
v/c Ratio	0.27	0.48		0.01	0.64	0.07		0.19		0.46	0.62	
Control Delay	4.9	6.3		6.0	14.1	1.4		31.7		54.7	23.6	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.9	6.3		6.0	14.3	1.4		31.7		54.7	23.6	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		6.1			13.1			31.7			32.0	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	20	147		1	343	2		8		46	32	
Queue Length 95th (ft)	m36	254		m2	558	7		33		87	98	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	452	1391		514	1242	1091		238		285	441	
Starvation Cap Reductn	0	0		0	59	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	0.26	0.48		0.01	0.67	0.07		0.10		0.24	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 12.9

Intersection LOS: B

Intersection Capacity Utilization 70.9%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2029 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	611	13	4	741	68	9	3	10	63	40	130
Future Volume (veh/h)	109	611	13	4	741	68	9	3	10	63	40	130
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	117	657	12	4	797	60	10	3	7	68	43	69
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	570	1348	25	644	1399	1194	67	27	24	192	62	99
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09
Sat Flow, veh/h	1629	1661	30	800	1935	1652	182	282	250	1375	633	1015
Grp Volume(v), veh/h	117	0	669	4	797	60	20	0	0	68	0	112
Grp Sat Flow(s),veh/h/ln	1629	0	1691	800	1935	1652	713	0	0	1375	0	1648
Q Serve(g_s), s	1.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.3
Cycle Q Clear(g_c), s	1.8	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	5.7	0.0	7.3
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.35	1.00		0.62
Lane Grp Cap(c), veh/h	570	0	1373	644	1399	1194	112	0	0	192	0	160
V/C Ratio(X)	0.21	0.00	0.49	0.01	0.57	0.05	0.18	0.00	0.00	0.35	0.00	0.70
Avail Cap(c_a), veh/h	632	0	1373	644	1399	1194	279	0	0	350	0	351
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(l)	0.64	0.00	0.64	0.84	0.84	0.84	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.4	0.0	0.0	0.0	0.0	0.0	45.9	0.0	0.0	47.4	0.0	48.4
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.0	1.4	0.1	0.8	0.0	0.0	1.1	0.0	5.4
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(95%),veh/ln	0.7	0.0	0.5	0.0	1.0	0.0	1.0	0.0	0.0	3.3	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.5	0.0	0.8	0.0	1.4	0.1	46.6	0.0	0.0	48.5	0.0	53.8
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h		786			861			20			180	
Approach Delay, s/veh		1.1			1.3			46.6			51.8	
Approach LOS		A			A			D			D	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.8	84.9		15.3		94.7		15.3				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	8.5	61.6		22.4		75.6		22.4				
Max Q Clear Time (g_c+I1), s	4.3	2.5		9.3		2.5		9.3				
Green Ext Time (p_c), s	0.1	1.1		0.5		0.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			6.6									
HCM 6th LOS			A									

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	588	24	21	621	14	68	24	18	16	21	76
Future Volume (vph)	55	588	24	21	621	14	68	24	18	16	21	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1746	0	1620	1700	0	1541	1658	0	0	1823	0
Flt Permitted	0.368			0.380			0.531				0.950	
Satd. Flow (perm)	640	1746	0	648	1700	0	861	1658	0	0	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			19			80	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	644	0	22	669	0	72	44	0	0	119	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.4	86.4		86.4	86.4		13.7	13.7			13.7	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.12	0.47		0.04	0.50		0.67	0.20			0.41	
Control Delay	5.7	7.3		3.8	6.3		74.1	28.6			20.6	
Queue Delay	0.0	0.1		0.0	0.1		0.0	0.0			0.0	
Total Delay	5.7	7.4		3.8	6.4		74.1	28.6			20.6	
LOS	A	A		A	A		E	C			C	
Approach Delay		7.3			6.3			56.9			20.6	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	11	169		3	135		49	16			25	
Queue Length 95th (ft)	29	226		11	263		95	47			75	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	502	1371		508	1335		320	629			700	
Starvation Cap Reductn	0	107		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	69		0	0			3	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.12	0.51		0.04	0.53		0.23	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.4

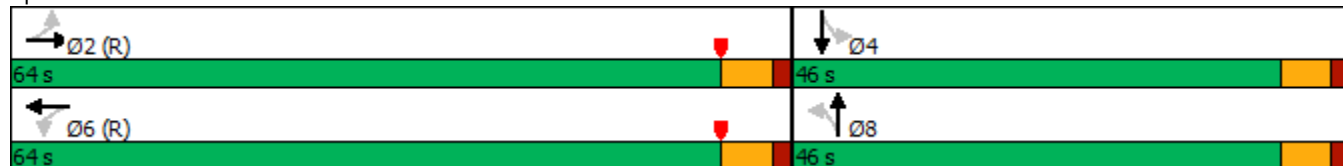
Intersection LOS: B

Intersection Capacity Utilization 70.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2029 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	588	24	21	621	14	68	24	18	16	21	76
Future Volume (veh/h)	55	588	24	21	621	14	68	24	18	16	21	76
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	58	619	20	22	654	14	72	25	7	17	22	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	589	1390	45	737	1551	33	173	103	29	63	53	64
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	708	1672	54	807	1865	40	1242	1315	368	286	677	815
Grp Volume(v), veh/h	58	0	639	22	0	668	72	0	32	72	0	0
Grp Sat Flow(s),veh/h/ln	708	0	1726	807	0	1905	1242	0	1683	1778	0	0
Q Serve(g_s), s	1.1	0.0	0.0	0.5	0.0	10.0	1.1	0.0	2.0	1.9	0.0	0.0
Cycle Q Clear(g_c), s	11.1	0.0	0.0	0.5	0.0	10.0	5.3	0.0	2.0	4.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.22	0.24		0.46
Lane Grp Cap(c), veh/h	589	0	1435	737	0	1584	173	0	132	164	0	0
V/C Ratio(X)	0.10	0.00	0.45	0.03	0.00	0.42	0.42	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	589	0	1435	737	0	1584	538	0	627	675	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)	0.87	0.00	0.87	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.6	0.0	0.0	1.6	0.0	2.4	49.1	0.0	47.7	49.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.9	0.1	0.0	0.8	1.6	0.0	0.9	1.9	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(95%),veh/ln	0.1	0.0	0.6	0.1	0.0	4.0	3.6	0.0	1.5	3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.9	0.0	0.9	1.7	0.0	3.2	50.7	0.0	48.7	50.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	697			690			104			72		
Approach Delay, s/veh	0.9			3.2			50.1			50.8		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.4			13.6			96.4			13.6		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.2			12.0			7.3		
Green Ext Time (p_c), s	25.2			0.2			24.8			0.3		

Intersection Summary

HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	436	1	60	272	142	0	0	157	28
Future Volume (vph)	0	0	0	436	1	60	272	142	0	0	157	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1640	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.952		0.489					
Satd. Flow (perm)	0	0	0	0	1640	1442	810	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	455	63	283	148	0	0	164	29
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					19.0	19.0	27.9	27.9			14.8	14.8
Actuated g/C Ratio					0.34	0.34	0.49	0.49			0.26	0.26
v/c Ratio					0.82	0.11	0.56	0.18			0.36	0.05
Control Delay					32.7	0.4	14.1	9.1			19.9	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					32.7	0.4	14.1	9.1			19.9	0.2
LOS					C	A	B	A			B	A
Approach Delay					28.8			12.4			17.0	
Approach LOS					C			B			B	
Queue Length 50th (ft)					135	0	57	27			47	0
Queue Length 95th (ft)					#291	0	104	55			91	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					598	630	508	876			526	585
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					0.76	0.10	0.56	0.17			0.31	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 56.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 20.6

Intersection LOS: C

Intersection Capacity Utilization 98.7%

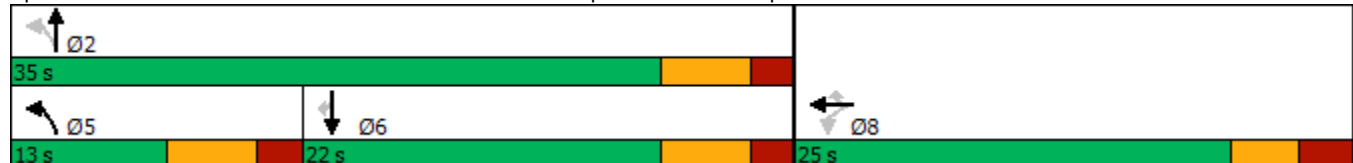
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2029 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	436	1	60	272	142	0	0	157	28
Future Volume (veh/h)	0	0	0	436	1	60	272	142	0	0	157	28
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				454	1	0	283	148	0	0	164	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				562	1		592	856	0	0	466	
Arrive On Green				0.30	0.32	0.00	0.15	0.50	0.00	0.00	0.25	0.00
Sat Flow, veh/h				1782	4	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				455	0	0	283	148	0	0	164	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				12.2	0.0	0.0	6.0	2.5	0.0	0.0	3.8	0.0
Cycle Q Clear(g_c), s				12.2	0.0	0.0	6.0	2.5	0.0	0.0	3.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				563	0		592	856	0	0	466	
V/C Ratio(X)				0.81	0.00		0.48	0.17	0.00	0.00	0.35	
Avail Cap(c_a), veh/h				706	0		592	988	0	0	610	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.8	0.0	0.0	10.1	7.1	0.0	0.0	16.0	0.0
Incr Delay (d2), s/veh				5.6	0.0	0.0	0.6	0.3	0.0	0.0	1.6	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
%ile BackOfQ(95%),veh/ln				9.2	0.0	0.0	3.1	1.3	0.0	0.0	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.4	0.0	0.0	10.7	7.4	0.0	0.0	17.6	0.0
LnGrp LOS				C	A		B	A	A	A	B	
Approach Vol, veh/h					455			431			164	
Approach Delay, s/veh					22.4			9.6			17.6	
Approach LOS					C			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		20.9				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		4.5			8.0	5.8		14.2				
Green Ext Time (p_c), s		2.9			0.0	1.8		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				16.4								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	276	0	0	0	0	381	442	89	507	0
Future Volume (vph)	24	0	276	0	0	0	0	381	442	89	507	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1673	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1673	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	297	0	0	0	0	885	0	96	545	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 98.7%

ICU Level of Service F

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2029 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	24	0	276	0	0	0	0	381	442	89	507	0
Future Vol, veh/h	24	0	276	0	0	0	0	381	442	89	507	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	26	0	297	0	0	0	0	410	475	96	545	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1147	1147	545	-	0	0	410	0	0
Stage 1	737	737	-	-	-	-	-	-	-
Stage 2	410	410	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	223	243	594	0	-	-	909	-	0
Stage 1	572	483	-	0	-	-	-	-	0
Stage 2	786	641	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	199	0	594	-	-	-	909	-	-
Mov Cap-2 Maneuver	199	0	-	-	-	-	-	-	-
Stage 1	572	0	-	-	-	-	-	-	-
Stage 2	703	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.7	0	1.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	199	594	909	-
HCM Lane V/C Ratio	-	-	0.13	0.5	0.105	-
HCM Control Delay (s)	-	-	25.8	17	9.4	-
HCM Lane LOS	-	-	D	C	A	-
HCM 95th %tile Q(veh)	-	-	0.4	2.8	0.4	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2029 Build
SAT Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	14	795	798	3
Future Volume (vph)	6	11	14	795	798	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1798	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1798	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	861	852	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 63.1% ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	14	795	798	3
Future Vol, veh/h	6	11	14	795	798	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	15	846	849	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1727	851	852	0	-	0
Stage 1	851	-	-	-	-	-
Stage 2	876	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	94	378	666	-	-	-
Stage 1	430	-	-	-	-	-
Stage 2	418	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	90	378	666	-	-	-
Mov Cap-2 Maneuver	90	-	-	-	-	-
Stage 1	412	-	-	-	-	-
Stage 2	418	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	27.5	0.2		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	666	-	178	-	-	
HCM Lane V/C Ratio	0.022	-	0.102	-	-	
HCM Control Delay (s)	10.5	0	27.5	-	-	
HCM Lane LOS	B	A	D	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	24	76	11	22	33	51	633	8	20	616	185
Future Volume (vph)	155	24	76	11	22	33	51	633	8	20	616	185
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1664	0	1572	1636	0	1620	1712	0	1550	1700	0
Flt Permitted	0.719			0.689			0.223			0.327		
Satd. Flow (perm)	1226	1664	0	1140	1636	0	380	1712	0	534	1700	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		80			35			2			42	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	105	0	12	58	0	54	674	0	21	843	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.8	12.8		12.5	12.5		40.4	40.4		40.4	40.4	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.67	0.67		0.67	0.67	
v/c Ratio	0.62	0.25		0.05	0.16		0.21	0.58		0.06	0.73	
Control Delay	32.0	9.0		17.9	11.1		7.3	10.0		6.2	14.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	32.0	9.0		17.9	11.1		7.3	10.0		6.2	14.5	
LOS	C	A		B	B		A	B		A	B	
Approach Delay		23.0			12.2			9.8			14.3	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)	52	7		3	7		8	143		3	202	
Queue Length 95th (ft)	104	39		14	30		m18	336		11	#458	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	476		285	435		256	1154		360	1159	
Starvation Cap Reductn	0	0		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	0.53	0.22		0.04	0.13		0.21	0.58		0.06	0.73	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 13.7

Intersection LOS: B

Intersection Capacity Utilization 70.6%

ICU Level of Service C

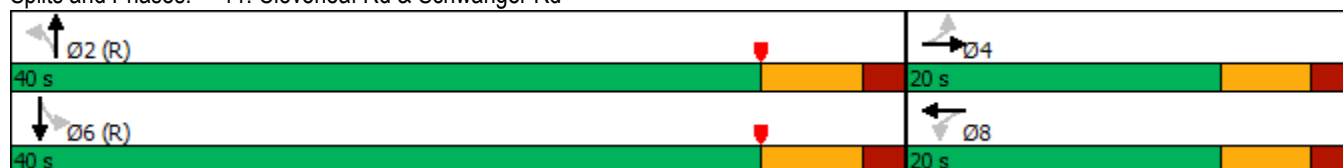
Analysis Period (min) 15

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2029 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	24	76	11	22	33	51	633	8	20	616	185
Future Volume (veh/h)	155	24	76	11	22	33	51	633	8	20	616	185
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	163	25	53	12	23	21	54	666	7	21	648	161
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	352	108	229	301	161	147	372	1185	12	365	960	239
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.21	0.21	0.21	0.64	0.64	0.62
Sat Flow, veh/h	1436	590	1251	1236	876	800	689	1846	19	768	1496	372
Grp Volume(v), veh/h	163	0	78	12	0	44	54	0	673	21	0	809
Grp Sat Flow(s),veh/h/ln	1436	0	1841	1236	0	1676	689	0	1866	768	0	1868
Q Serve(g_s), s	6.4	0.0	2.2	0.5	0.0	1.3	4.2	0.0	19.4	1.1	0.0	16.5
Cycle Q Clear(g_c), s	7.8	0.0	2.2	2.7	0.0	1.3	20.8	0.0	19.4	20.5	0.0	16.5
Prop In Lane	1.00		0.68	1.00		0.48	1.00		0.01	1.00		0.20
Lane Grp Cap(c), veh/h	352	0	338	301	0	307	372	0	1197	365	0	1198
V/C Ratio(X)	0.46	0.00	0.23	0.04	0.00	0.14	0.15	0.00	0.56	0.06	0.00	0.68
Avail Cap(c_a), veh/h	447	0	460	384	0	419	372	0	1197	365	0	1198
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.85	0.00	0.85	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	21.2	22.1	0.0	20.8	24.1	0.0	16.1	14.3	0.0	6.9
Incr Delay (d2), s/veh	1.0	0.0	0.3	0.1	0.0	0.2	0.7	0.0	1.6	0.3	0.0	3.1
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(95%),veh/ln	3.8	0.0	1.6	0.2	0.0	0.9	1.5	0.0	14.5	0.4	0.0	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	21.5	22.1	0.0	21.0	24.8	0.0	17.7	14.6	0.0	9.9
LnGrp LOS	C	A	C	C	A	C	C	A	B	B	A	A
Approach Vol, veh/h	241			56			727			830		
Approach Delay, s/veh	23.7			21.2			18.3			10.0		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.0			16.0			44.0			16.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	21.4			9.8			18.5			4.7		
Green Ext Time (p_c), s	9.0			0.3			12.4			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	15.4											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	13	24	0	7	16	683	7	11	709	7
Future Volume (vph)	5	1	13	24	0	7	16	683	7	11	709	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1696	0	0	1671	0	0	1722	1648
Flt Permitted					0.990			0.981			0.989	
Satd. Flow (perm)	0	1740	1581	0	1746	0	0	1641	0	0	1705	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	14	0	32	0	0	743	0	0	758	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.13			0.51			0.50	0.00
Control Delay		23.5	0.5		5.2			4.2			2.3	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.5		5.2			4.2			2.3	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.4			5.2			4.2			2.3	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		13			194			14	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		379			1454			1511	1466
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		0.02	0.04		0.08			0.51			0.50	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 3.3

Intersection LOS: A

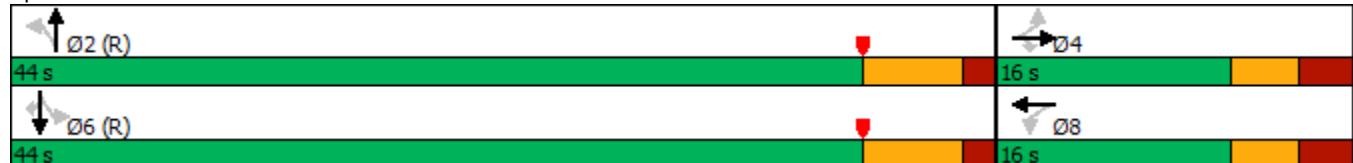
Intersection Capacity Utilization 68.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2029 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	13	24	0	7	16	683	7	11	709	7
Future Volume (veh/h)	5	1	13	24	0	7	16	683	7	11	709	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	7	25	0	3	17	719	7	12	746	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	172	12	71	164	0	6	72	1339	13	67	1455	1317
Arrive On Green	0.03	0.04	0.04	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1393	279	1586	1121	0	134	14	1680	16	8	1825	1652
Grp Volume(v), veh/h	6	0	7	28	0	0	743	0	0	758	0	7
Grp Sat Flow(s),veh/h/ln	1672	0	1586	1255	0	0	1710	0	0	1833	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.3	1.4	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.89		0.11	0.02		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	157	0	71	149	0	0	1396	0	0	1492	0	1317
V/C Ratio(X)	0.04	0.00	0.10	0.19	0.00	0.00	0.53	0.00	0.00	0.51	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1396	0	0	1492	0	1317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.63	0.00	0.63
Uniform Delay (d), s/veh	27.9	0.0	27.5	28.6	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.6	0.0	0.0	1.5	0.0	0.0	0.8	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(95%),veh/ln	0.2	0.0	0.2	0.8	0.0	0.0	1.8	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	28.1	29.2	0.0	0.0	3.6	0.0	0.0	0.8	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	13		28				743				765	
Approach Delay, s/veh	28.0		29.2				3.6				0.8	
Approach LOS	C		C				A				A	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	52.8		7.2		52.8		7.2					
Change Period (Y+Rc), s	6.0		5.5		6.0		5.5					
Max Green Setting (Gmax), s	38.0		10.5		38.0		10.5					
Max Q Clear Time (g_c+I1), s	11.3		2.3		2.0		3.4					
Green Ext Time (p_c), s	18.5		0.0		23.7		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	2.9											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	367	56	126	451	139	72	181	68	129	143	139
Future Volume (vph)	226	367	56	126	451	139	72	181	68	129	143	139
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1807	0	1558	1624	1499
Flt Permitted	0.163			0.539			0.664			0.461		
Satd. Flow (perm)	270	1809	1435	866	1731	1592	1213	1807	0	756	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		23				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	374	57	129	460	142	73	254	0	132	146	142
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	32.6	32.6	32.6	18.9	18.9	18.9	20.2	14.3		20.4	14.4	14.4
Actuated g/C Ratio	0.47	0.47	0.47	0.27	0.27	0.27	0.29	0.21		0.29	0.21	0.21
v/c Ratio	0.82	0.44	0.07	0.55	0.98	0.23	0.18	0.65		0.42	0.43	0.28
Control Delay	42.5	16.3	0.2	35.4	66.9	0.9	14.8	31.9		18.8	29.1	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	42.5	16.3	0.2	35.4	66.9	0.9	14.8	31.9		18.8	29.1	1.4
LOS	D	B	A	D	E	A	B	C		B	C	A
Approach Delay		24.0			48.5			28.1			16.5	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	66	115	0	51	~231	0	20	95		38	57	0
Queue Length 95th (ft)	#192	195	0	#124	#415	0	44	167		73	109	1
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	280	852	760	235	471	619	418	482		317	418	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.82	0.44	0.07	0.55	0.98	0.23	0.17	0.53		0.42	0.35	0.25

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 69.2

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 31.5

Intersection LOS: C

Intersection Capacity Utilization 79.4%

ICU Level of Service D

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2029 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	367	56	126	451	139	72	181	68	129	143	139
Future Volume (veh/h)	226	367	56	126	451	139	72	181	68	129	143	139
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	231	374	51	129	460	0	73	185	66	132	146	60
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	324	860	729	347	486		422	256	91	337	348	307
Arrive On Green	0.12	0.47	0.47	0.27	0.27	0.00	0.06	0.17	0.15	0.11	0.21	0.21
Sat Flow, veh/h	1723	1837	1557	894	1794	1557	2069	1538	549	1576	1641	1450
Grp Volume(v), veh/h	231	374	51	129	460	0	73	0	251	132	146	60
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	894	1794	1557	2069	0	2087	1576	1641	1450
Q Serve(g_s), s	6.1	9.3	1.2	8.4	17.2	0.0	1.9	0.0	7.8	4.5	5.3	2.3
Cycle Q Clear(g_c), s	6.1	9.3	1.2	8.4	17.2	0.0	1.9	0.0	7.8	4.5	5.3	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	324	860	729	347	486		422	0	348	337	348	307
V/C Ratio(X)	0.71	0.43	0.07	0.37	0.95		0.17	0.00	0.72	0.39	0.42	0.20
Avail Cap(c_a), veh/h	324	860	729	347	486		532	0	534	350	420	371
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	12.1	10.0	21.2	24.4	0.0	21.0	0.0	27.1	20.0	23.3	22.1
Incr Delay (d2), s/veh	7.1	0.1	0.0	0.2	27.7	0.0	0.2	0.0	2.8	0.7	0.8	0.3
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(95%),veh/ln	4.7	5.6	0.6	2.8	15.3	0.0	1.7	0.0	7.3	2.8	3.5	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	12.3	10.0	21.5	52.1	0.0	21.2	0.0	29.9	20.8	24.1	22.4
LnGrp LOS	C	B	B	C	D		C	A	C	C	C	C
Approach Vol, veh/h	656			589			324			338		
Approach Delay, s/veh	16.0			45.4			28.0			22.5		
Approach LOS	B			D			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	24.0	13.5	17.4		37.5	10.3	20.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	8.6	19.7	7.0	9.8		11.8	4.4	7.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.6		0.1	0.0	0.6				

Intersection Summary

HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	268	0	440	71	281	411	0
Future Volume (vph)	0	0	0	0	0	268	0	440	71	281	411	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1844	1567	1787	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1844	1567	1787	1863	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	298	0	489	79	312	457	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 51.5%

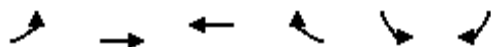
ICU Level of Service A

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2029 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↖	↗	↖	↗	
Traffic Vol, veh/h	0	0	0	0	0	268	0	440	71	281	411	0
Future Vol, veh/h	0	0	0	0	0	268	0	440	71	281	411	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	0	0	0	298	0	489	79	312	457	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	457	-	-	489	457	0	0	568	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	604	0	0	611	1104	-	-	814	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	604	-	-	611	1104	-	-	814	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		16.4		0		4.9					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1104	-	-	-	611	814	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.487	0.384	-	-				
HCM Control Delay (s)	0	-	-	0	16.4	12.1	-	-				
HCM Lane LOS	A	-	-	A	C	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	2.7	1.8	-	-				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	188	376	479	94	150	300
Future Volume (vph)	188	376	479	94	150	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350			225	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	1881	1881	1583	1668	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1770	1881	1881	1583	1668	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	209	418	532	104	500	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 72.4% ICU Level of Service C

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	40.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	188	376	479	94	150	300
Future Vol, veh/h	188	376	479	94	150	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	350	-	-	225	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	1	1	2	2	2
Mvmt Flow	209	418	532	104	167	333
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	636	0	-	0	1368	532
Stage 1	-	-	-	-	532	-
Stage 2	-	-	-	-	836	-
Critical Hdwy	4.5	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	698	-	-	-	175	577
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	473	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	698	-	-	- ~	123	577
Mov Cap-2 Maneuver	-	-	-	-	271	-
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	473	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.1	0		137.7		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	698	-	-	-	419	
HCM Lane V/C Ratio	0.299	-	-	-	1.193	
HCM Control Delay (s)	12.3	-	-	-	137.7	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	1.3	-	-	-	19.7	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2029 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	50	33	16	33	61	20	223	7	38	225	43
Future Volume (vph)	48	50	33	16	33	61	20	223	7	38	225	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1676	0	0	1623	0	0	1774	0	0	1848	0
Flt Permitted		0.982			0.993			0.996			0.994	
Satd. Flow (perm)	0	1676	0	0	1623	0	0	1774	0	0	1848	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	115	0	0	260	0	0	319	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	45.5%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

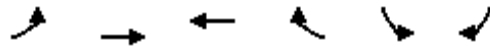
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	48	50	33	16	33	61	20	223	7	38	225	43
Future Vol, veh/h	48	50	33	16	33	61	20	223	7	38	225	43
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	50	52	34	17	34	64	21	232	7	40	234	45
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.2	9.4	11.2	11.7
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	37%	15%	12%
Vol Thru, %	89%	38%	30%	74%
Vol Right, %	3%	25%	55%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	131	110	306
LT Vol	20	48	16	38
Through Vol	223	50	33	225
RT Vol	7	33	61	43
Lane Flow Rate	260	136	115	319
Geometry Grp	1	1	1	1
Degree of Util (X)	0.371	0.213	0.169	0.438
Departure Headway (Hd)	5.133	5.623	5.312	4.947
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	701	639	675	733
Service Time	3.162	3.659	3.351	2.947
HCM Lane V/C Ratio	0.371	0.213	0.17	0.435
HCM Control Delay	11.2	10.2	9.4	11.7
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	1.7	0.8	0.6	2.2

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2029 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	485	523	34	32	3
Future Volume (vph)	3	485	523	34	32	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1796	0	1660	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1796	0	1660	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	505	580	0	36	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 39.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	485	523	34	32	3
Future Vol, veh/h	3	485	523	34	32	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	505	545	35	33	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	580	0	-	0	1074	563
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	511	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	782	-	-	-	239	539
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	647	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	782	-	-	-	238	539
Mov Cap-2 Maneuver	-	-	-	-	394	-
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	647	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		14.8		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	782	-	-	-	403	
HCM Lane V/C Ratio	0.004	-	-	-	0.09	
HCM Control Delay (s)	9.6	-	-	-	14.8	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

APPENDIX L7

2029 BUILD WITH IMPROVEMENTS CONDITION ANALYSES

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	23	34	6	44	123	47	345	9	32	193	79
Future Volume (vph)	71	23	34	6	44	123	47	345	9	32	193	79
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1232	0	0	1456	0	0	1577	0	0	1434	0
Flt Permitted		0.785			0.988			0.931			0.933	
Satd. Flow (perm)	0	994	0	0	1441	0	0	1477	0	0	1345	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		23			128			2			36	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	180	0	0	417	0	0	316	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		50.0	50.0		50.0	50.0	
Total Split (%)	37.5%	37.5%		37.5%	37.5%		62.5%	62.5%		62.5%	62.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		11.9			11.9			21.9			21.9	
Actuated g/C Ratio		0.27			0.27			0.50			0.50	
v/c Ratio		0.47			0.37			0.57			0.46	
Control Delay		17.9			8.0			12.3			9.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.9			8.0			12.3			9.8	
LOS		B			A			B			A	
Approach Delay		17.9			8.0			12.3			9.8	
Approach LOS		B			A			B			A	
Queue Length 50th (ft)		19			8			61			37	
Queue Length 95th (ft)		74			53			168			114	
Internal Link Dist (ft)		1077			1324			919			946	
Turn Bay Length (ft)												
Base Capacity (vph)		596			903			1393			1270	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.22			0.20			0.30			0.25	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 44.2

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 11.5

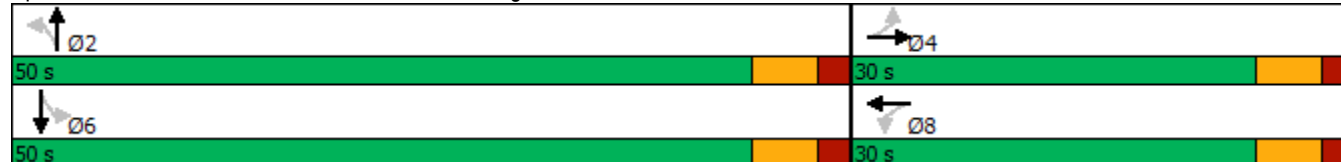
Intersection LOS: B

Intersection Capacity Utilization 61.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave



HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	23	34	6	44	123	47	345	9	32	193	79
Future Volume (veh/h)	71	23	34	6	44	123	47	345	9	32	193	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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	74	24	35	6	46	128	49	359	9	33	201	82
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	372	93	91	147	93	243	194	583	14	184	452	170
Arrive On Green	0.19	0.22	0.19	0.19	0.22	0.19	0.36	0.40	0.36	0.36	0.40	0.36
Sat Flow, veh/h	717	418	405	26	416	1089	104	1463	35	85	1135	427
Grp Volume(v), veh/h	133	0	0	180	0	0	417	0	0	316	0	0
Grp Sat Flow(s),veh/h/ln	1541	0	0	1531	0	0	1602	0	0	1647	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.5	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	2.8	0.0	0.0	5.6	0.0	0.0	3.8	0.0	0.0
Prop In Lane	0.56		0.26	0.03		0.71	0.12		0.02	0.10		0.26
Lane Grp Cap(c), veh/h	498	0	0	425	0	0	730	0	0	745	0	0
V/C Ratio(X)	0.27	0.00	0.00	0.42	0.00	0.00	0.57	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	1442	0	0	1524	0	0	2746	0	0	2779	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.0	0.0	0.0	9.4	0.0	0.0	6.5	0.0	0.0	6.1	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.0	0.0	0.7	0.0	0.0	0.4	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(95%),veh/ln	0.8	0.0	0.0	1.2	0.0	0.0	2.3	0.0	0.0	1.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	0.0	0.0	10.1	0.0	0.0	7.2	0.0	0.0	6.4	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		133			180			417			316	
Approach Delay, s/veh		9.3			10.1			7.2			6.4	
Approach LOS		A			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.5		10.9		15.5		10.9				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		44.0		24.0		44.0		24.0				
Max Q Clear Time (g_c+I1), s		7.6		3.8		5.8		4.8				
Green Ext Time (p_c), s		1.9		0.4		1.5		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				7.7								
HCM 6th LOS				A								

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	83	78	4	52	66	33	301	6	98	358	55
Future Volume (vph)	86	83	78	4	52	66	33	301	6	98	358	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1315	0	0	1486	0	0	1583	0	0	1489	0
Flt Permitted		0.853			0.987			0.927			0.863	
Satd. Flow (perm)	0	1141	0	0	1469	0	0	1474	0	0	1297	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		39			69			2			16	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	257	0	0	127	0	0	354	0	0	532	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.0	22.0		22.0	22.0	
Total Split (s)	22.0	22.0		22.0	22.0		38.0	38.0		38.0	38.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		14.7			14.7			28.0			28.0	
Actuated g/C Ratio		0.28			0.28			0.53			0.53	
v/c Ratio		0.74			0.28			0.45			0.77	
Control Delay		31.4			10.6			10.3			19.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		31.4			10.6			10.3			19.3	
LOS		C			B			B			B	
Approach Delay		31.4			10.6			10.3			19.3	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		61			13			67			127	
Queue Length 95th (ft)		#177			51			122			#269	
Internal Link Dist (ft)		1066			1154			917			948	
Turn Bay Length (ft)												
Base Capacity (vph)		399			526			936			828	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.64			0.24			0.38			0.64	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 52.9

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 18.4

Intersection LOS: B

Intersection Capacity Utilization 79.4%

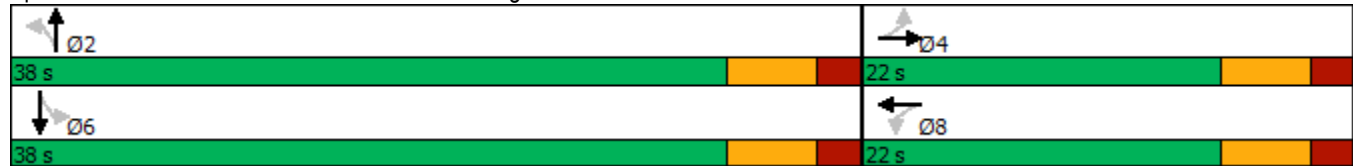
ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave



HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	83	78	4	52	66	33	301	6	98	358	55
Future Volume (veh/h)	86	83	78	4	52	66	33	301	6	98	358	55
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	90	86	81	4	54	69	34	314	6	102	373	57
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	252	160	122	116	180	220	151	679	12	222	542	76
Arrive On Green	0.23	0.26	0.23	0.23	0.26	0.23	0.41	0.44	0.41	0.41	0.44	0.41
Sat Flow, veh/h	415	624	478	18	704	860	74	1529	28	210	1221	172
Grp Volume(v), veh/h	257	0	0	127	0	0	354	0	0	532	0	0
Grp Sat Flow(s),veh/h/ln	1518	0	0	1582	0	0	1630	0	0	1602	0	0
Q Serve(g_s), s	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0
Cycle Q Clear(g_c), s	5.1	0.0	0.0	2.2	0.0	0.0	5.1	0.0	0.0	9.2	0.0	0.0
Prop In Lane	0.35		0.32	0.03		0.54	0.10		0.02	0.19		0.11
Lane Grp Cap(c), veh/h	489	0	0	469	0	0	793	0	0	792	0	0
V/C Ratio(X)	0.53	0.00	0.00	0.27	0.00	0.00	0.45	0.00	0.00	0.67	0.00	0.00
Avail Cap(c_a), veh/h	857	0	0	866	0	0	1634	0	0	1624	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.3	0.0	0.0	10.3	0.0	0.0	6.6	0.0	0.0	7.7	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	1.0	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(95%),veh/ln	2.5	0.0	0.0	1.1	0.0	0.0	2.4	0.0	0.0	4.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.2	0.0	0.0	10.6	0.0	0.0	7.0	0.0	0.0	8.7	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		257			127			354			532	
Approach Delay, s/veh		12.2			10.6			7.0			8.7	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		19.8		13.5		19.8		13.5				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		32.0		16.0		32.0		16.0				
Max Q Clear Time (g_c+I1), s		7.1		7.1		11.2		4.2				
Green Ext Time (p_c), s		1.5		0.6		2.5		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				9.1								
HCM 6th LOS				A								

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	50	33	16	33	61	20	223	7	38	225	43
Future Volume (vph)	48	50	33	16	33	61	20	223	7	38	225	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1588	0	0	1537	0	0	1681	0	0	1751	0
Flt Permitted		0.831			0.923			0.958			0.935	
Satd. Flow (perm)	0	1344	0	0	1429	0	0	1617	0	0	1647	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			64			3			17	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	115	0	0	260	0	0	319	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		45.0	45.0		45.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		9.4			9.4			18.0			18.0	
Actuated g/C Ratio		0.28			0.28			0.54			0.54	
v/c Ratio		0.35			0.26			0.30			0.36	
Control Delay		11.4			7.1			8.1			8.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		11.4			7.1			8.1			8.2	
LOS		B			A			A			A	
Approach Delay		11.4			7.1			8.1			8.2	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		14			6			28			34	
Queue Length 95th (ft)		50			34			75			90	
Internal Link Dist (ft)		930			1052			920			945	
Turn Bay Length (ft)												
Base Capacity (vph)		1025			1099			1605			1635	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.13			0.10			0.16			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 33.6

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 8.6

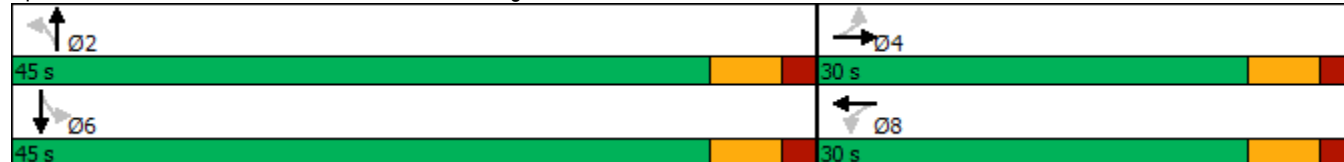
Intersection LOS: A

Intersection Capacity Utilization 49.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 29: Colebrook Rd & Harrisburg Ave



HCM 6th Signalized Intersection Summary
29: Colebrook Rd & Harrisburg Ave

2029 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	50	33	16	33	61	20	223	7	38	225	43
Future Volume (veh/h)	48	50	33	16	33	61	20	223	7	38	225	43
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	1724	1780	1837	1837	1795	1837	1724	1766	1794	1986	1958	1858
Adj Flow Rate, veh/h	50	52	34	17	34	64	21	232	7	40	234	45
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	8	4	0	0	3	0	5	2	0	0	2	9
Cap, veh/h	338	119	76	231	101	175	205	547	16	235	492	88
Arrive On Green	0.14	0.19	0.14	0.14	0.19	0.14	0.30	0.34	0.30	0.30	0.34	0.30
Sat Flow, veh/h	567	624	397	200	526	912	70	1593	46	135	1433	258
Grp Volume(v), veh/h	136	0	0	115	0	0	260	0	0	319	0	0
Grp Sat Flow(s),veh/h/ln	1588	0	0	1638	0	0	1709	0	0	1826	0	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Cycle Q Clear(g_c), s	1.6	0.0	0.0	1.3	0.0	0.0	2.5	0.0	0.0	3.0	0.0	0.0
Prop In Lane	0.37		0.25	0.15		0.56	0.08		0.03	0.13		0.14
Lane Grp Cap(c), veh/h	459	0	0	430	0	0	688	0	0	730	0	0
V/C Ratio(X)	0.30	0.00	0.00	0.27	0.00	0.00	0.38	0.00	0.00	0.44	0.00	0.00
Avail Cap(c_a), veh/h	1893	0	0	1930	0	0	3215	0	0	3420	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.9	0.0	0.0	7.9	0.0	0.0	5.5	0.0	0.0	5.7	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.4	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(95%),veh/ln	0.6	0.0	0.0	0.5	0.0	0.0	1.0	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.3	0.0	0.0	8.2	0.0	0.0	5.9	0.0	0.0	6.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		136			115			260			319	
Approach Delay, s/veh		8.3			8.2			5.9			6.1	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		12.4		9.1		12.4		9.1				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		39.0		24.0		39.0		24.0				
Max Q Clear Time (g_c+I1), s		4.5		3.6		5.0		3.3				
Green Ext Time (p_c), s		1.1		0.4		1.4		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				6.7								
HCM 6th LOS				A								

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	34	97	9	42	36	79	723	14	50	975	327
Future Volume (vph)	224	34	97	9	42	36	79	723	14	50	975	327
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1670	0	1416	1704	0	1620	1694	0	1628	1678	0
Flt Permitted	0.704			0.669			0.096			0.295		
Satd. Flow (perm)	1200	1670	0	997	1704	0	164	1694	0	506	1678	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		102			38			4			65	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	236	138	0	9	82	0	83	776	0	53	1370	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	13.0	13.0		13.0	13.0		47.0	47.0		47.0	47.0	
Total Split (%)	21.7%	21.7%		21.7%	21.7%		78.3%	78.3%		78.3%	78.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	8.0	8.0		8.0	8.0		41.5	41.5		41.5	41.5	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.69	0.69		0.69	0.69	
v/c Ratio	1.48	0.44		0.07	0.32		0.73	0.66		0.15	1.16	
Control Delay	270.8	14.2		24.2	18.4		42.5	10.8		4.4	96.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	270.8	14.2		24.2	18.4		42.5	10.8		4.4	96.6	
LOS	F	B		C	B		D	B		A	F	
Approach Delay		176.1			19.0			13.9			93.2	
Approach LOS		F			B			B			F	
Queue Length 50th (ft)	~121	12		3	14		37	305		5	~604	
Queue Length 95th (ft)	#241	55		14	48		m#75	258		15	#836	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2029 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	160	311		132	260		113	1172		349	1180	
Starvation Cap Reductn	0	0		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	1.48	0.44		0.07	0.32		0.73	0.66		0.15	1.16	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.48

Intersection Signal Delay: 77.2

Intersection LOS: E

Intersection Capacity Utilization 103.7%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



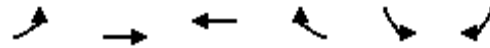
HCM 6th Signalized Intersection Summary 11: Cloverleaf Rd & Schwanger Rd

2029 Build w/ Improvements
PM Peak Hour

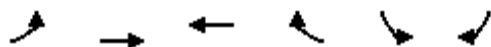
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	34	97	9	42	36	79	723	14	50	975	327
Future Volume (veh/h)	224	34	97	9	42	36	79	723	14	50	975	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	236	36	78	9	44	24	83	761	14	53	1026	333
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	257	77	168	202	148	81	120	1256	23	395	961	312
Arrive On Green	0.13	0.13	0.12	0.13	0.13	0.12	0.46	0.46	0.45	0.69	0.69	0.68
Sat Flow, veh/h	1406	581	1258	1091	1107	604	409	1815	33	725	1389	451
Grp Volume(v), veh/h	236	0	114	9	0	68	83	0	775	53	0	1359
Grp Sat Flow(s),veh/h/ln	1406	0	1839	1091	0	1711	409	0	1849	725	0	1839
Q Serve(g_s), s	5.8	0.0	3.5	0.5	0.0	2.2	0.0	0.0	18.8	2.9	0.0	41.5
Cycle Q Clear(g_c), s	8.0	0.0	3.5	3.9	0.0	2.2	41.5	0.0	18.8	21.7	0.0	41.5
Prop In Lane	1.00		0.68	1.00		0.35	1.00		0.02	1.00		0.25
Lane Grp Cap(c), veh/h	257	0	245	202	0	228	120	0	1279	395	0	1272
V/C Ratio(X)	0.92	0.00	0.46	0.04	0.00	0.30	0.69	0.00	0.61	0.13	0.00	1.07
Avail Cap(c_a), veh/h	257	0	245	202	0	228	120	0	1279	395	0	1272
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.3	0.0	24.3	25.8	0.0	23.6	36.8	0.0	10.0	12.5	0.0	9.4
Incr Delay (d2), s/veh	35.3	0.0	1.4	0.1	0.0	0.7	19.5	0.0	1.4	0.7	0.0	45.6
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(95%),veh/ln	9.6	0.0	2.7	0.2	0.0	1.5	3.3	0.0	11.4	0.9	0.0	33.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.6	0.0	25.7	25.9	0.0	24.4	56.3	0.0	11.4	13.2	0.0	55.0
LnGrp LOS	E	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	350			77			858			1412		
Approach Delay, s/veh	51.3			24.5			15.8			53.4		
Approach LOS	D			C			B			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	47.0			13.0			47.0			13.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	40.5			7.0			40.5			7.0		
Max Q Clear Time (g_c+I1), s	20.8			10.0			43.5			5.9		
Green Ext Time (p_c), s	15.1			0.0			0.0			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	40.3											
HCM 6th LOS	D											

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2029 Build w/ Improvements
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	113	294	399	51	65	141
Future Volume (vph)	113	294	399	51	65	141
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1710	1651	1714	1500	1676	1500
Flt Permitted	0.405				0.950	
Satd. Flow (perm)	729	1651	1714	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				57		157
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2697		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	9%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	126	327	443	57	72	157
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	22.0	22.0	22.0	22.0	13.0
Total Split (s)	13.0	57.0	44.0	44.0	23.0	13.0
Total Split (%)	16.3%	71.3%	55.0%	55.0%	28.8%	16.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	62.3	63.3	49.0	49.0	10.0	21.0
Actuated g/C Ratio	0.78	0.79	0.61	0.61	0.12	0.26
v/c Ratio	0.19	0.25	0.42	0.06	0.34	0.31
Control Delay	3.7	3.8	11.3	3.0	35.7	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.8	11.3	3.0	35.7	5.1
LOS	A	A	B	A	D	A
Approach Delay		3.8	10.4		14.8	
Approach LOS		A	B		B	
Queue Length 50th (ft)	13	40	113	0	33	0
Queue Length 95th (ft)	31	80	212	16	69	37
Internal Link Dist (ft)		730	2617		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	674	1307	1050	941	377	514



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.19	0.25	0.42	0.06	0.19	0.31

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 45.1%

ICU Level of Service A

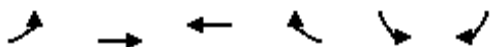
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

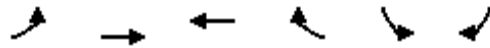
2029 Build w/ Improvements
AM Peak Hour



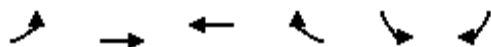
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	113	294	399	51	65	141
Future Volume (veh/h)	113	294	399	51	65	141
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1800	1674	1730	1772	1772	1772
Adj Flow Rate, veh/h	126	327	443	57	72	157
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	9	5	2	2	2
Cap, veh/h	610	1235	1066	925	231	295
Arrive On Green	0.06	0.74	0.62	0.62	0.14	0.14
Sat Flow, veh/h	1714	1674	1730	1502	1688	1502
Grp Volume(v), veh/h	126	327	443	57	72	157
Grp Sat Flow(s),veh/h/ln	1714	1674	1730	1502	1688	1502
Q Serve(g_s), s	1.9	5.1	10.6	1.2	3.1	7.5
Cycle Q Clear(g_c), s	1.9	5.1	10.6	1.2	3.1	7.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	610	1235	1066	925	231	295
V/C Ratio(X)	0.21	0.26	0.42	0.06	0.31	0.53
Avail Cap(c_a), veh/h	680	1235	1066	925	380	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.0	3.4	7.9	6.1	31.1	28.8
Incr Delay (d2), s/veh	0.2	0.5	1.2	0.1	0.8	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	2.0	6.0	0.6	2.3	5.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.2	3.9	9.1	6.3	31.9	30.3
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		453	500		229	
Approach Delay, s/veh		4.3	8.8		30.8	
Approach LOS		A	A		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.8	54.3			64.0	16.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	38.0			51.0	17.0
Max Q Clear Time (g_c+I1), s	3.9	12.6			7.1	9.5
Green Ext Time (p_c), s	0.1	1.8			1.2	0.5
Intersection Summary						
HCM 6th Ctrl Delay			11.3			
HCM 6th LOS			B			

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2029 Build w/ Improvements
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	169	462	461	77	150	326
Future Volume (vph)	169	462	461	77	150	326
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1748	1500	1676	1500
Flt Permitted	0.369				0.950	
Satd. Flow (perm)	651	1782	1748	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				83		197
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	3%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	513	512	86	167	362
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	22.0	22.0	22.0	22.0	13.0
Total Split (s)	16.0	68.0	52.0	52.0	52.0	16.0
Total Split (%)	13.3%	56.7%	43.3%	43.3%	43.3%	13.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	6.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	Min	None
Act Effect Green (s)	91.3	91.3	75.2	75.2	18.7	33.8
Actuated g/C Ratio	0.76	0.76	0.63	0.63	0.16	0.28
v/c Ratio	0.32	0.38	0.47	0.09	0.64	0.64
Control Delay	3.7	3.6	15.1	3.1	58.2	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.6	15.1	3.1	58.2	20.9
LOS	A	A	B	A	E	C
Approach Delay		3.6	13.4		32.7	
Approach LOS		A	B		C	
Queue Length 50th (ft)	18	57	190	1	123	112
Queue Length 95th (ft)	m31	m110	356	26	185	187
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	600	1356	1094	970	656	576



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.31	0.38	0.47	0.09	0.25	0.63

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 15.2

Intersection LOS: B

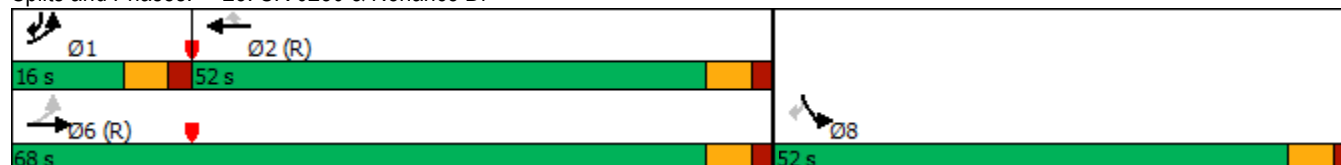
Intersection Capacity Utilization 56.8%

ICU Level of Service B

Analysis Period (min) 15

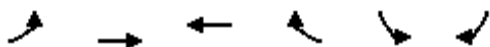
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2029 Build w/ Improvements
PM Peak Hour



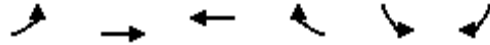
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	169	462	461	77	150	326
Future Volume (veh/h)	169	462	461	77	150	326
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1772	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	188	513	512	86	167	362
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	3	2	2	2
Cap, veh/h	459	1172	950	811	439	478
Arrive On Green	0.15	1.00	0.54	0.54	0.26	0.25
Sat Flow, veh/h	1688	1786	1758	1502	1688	1502
Grp Volume(v), veh/h	188	513	512	86	167	362
Grp Sat Flow(s),veh/h/ln	1688	1786	1758	1502	1688	1502
Q Serve(g_s), s	5.8	0.0	22.7	3.4	9.7	26.0
Cycle Q Clear(g_c), s	5.8	0.0	22.7	3.4	9.7	26.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	459	1172	950	811	439	478
V/C Ratio(X)	0.41	0.44	0.54	0.11	0.38	0.76
Avail Cap(c_a), veh/h	488	1172	950	811	661	675
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	0.0	17.9	13.5	36.4	36.8
Incr Delay (d2), s/veh	0.6	1.2	2.2	0.3	0.5	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.1	0.7	14.0	2.0	7.5	15.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.1	1.2	20.1	13.7	37.0	39.9
LnGrp LOS	B	A	C	B	D	D
Approach Vol, veh/h		701	598		529	
Approach Delay, s/veh		4.1	19.2		39.0	
Approach LOS		A	B		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.9	69.8			83.8	36.2
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	10.0	46.0			62.0	46.0
Max Q Clear Time (g_c+I1), s	7.8	24.7			2.0	28.0
Green Ext Time (p_c), s	0.1	2.2			2.0	2.3

Intersection Summary

HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

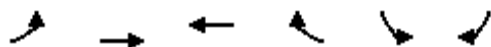
2029 Build w/ Improvements
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	188	376	479	94	150	300
Future Volume (vph)	188	376	479	94	150	300
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1782	1500	1676	1500
Flt Permitted	0.293				0.950	
Satd. Flow (perm)	517	1782	1782	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				104		236
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	209	418	532	104	167	333
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	13.0	20.0	20.0	20.0	10.0
Total Split (s)	14.0	53.0	39.0	39.0	22.0	14.0
Total Split (%)	18.7%	70.7%	52.0%	52.0%	29.3%	18.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	51.5	51.5	37.4	37.4	13.5	27.6
Actuated g/C Ratio	0.69	0.69	0.50	0.50	0.18	0.37
v/c Ratio	0.42	0.34	0.60	0.13	0.56	0.48
Control Delay	7.5	6.2	18.0	3.2	34.7	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	6.2	18.0	3.2	34.7	7.5
LOS	A	A	B	A	C	A
Approach Delay		6.7	15.6		16.6	
Approach LOS		A	B		B	
Queue Length 50th (ft)	30	68	173	0	71	29
Queue Length 95th (ft)	61	128	291	24	123	84
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	500	1224	888	799	379	706

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2029 Build w/ Improvements
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.42	0.34	0.60	0.13	0.44	0.47

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 33 (44%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 12.7

Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

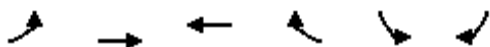
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2029 Build w/ Improvements
SAT Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	188	376	479	94	150	300
Future Volume (veh/h)	188	376	479	94	150	300
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	1772	1786	1786	1772	1772	1772
Adj Flow Rate, veh/h	209	418	532	104	167	333
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	1	2	2	2
Cap, veh/h	450	1143	851	715	383	486
Arrive On Green	0.10	0.64	0.48	0.48	0.23	0.23
Sat Flow, veh/h	1688	1786	1786	1502	1688	1502
Grp Volume(v), veh/h	209	418	532	104	167	333
Grp Sat Flow(s),veh/h/ln	1688	1786	1786	1502	1688	1502
Q Serve(g_s), s	4.2	8.3	16.7	2.9	6.4	14.5
Cycle Q Clear(g_c), s	4.2	8.3	16.7	2.9	6.4	14.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	450	1143	851	715	383	486
V/C Ratio(X)	0.46	0.37	0.63	0.15	0.44	0.69
Avail Cap(c_a), veh/h	489	1143	851	715	383	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	6.3	14.6	11.1	24.9	22.0
Incr Delay (d2), s/veh	0.7	0.9	3.5	0.4	0.8	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	4.4	10.5	1.6	4.6	9.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.8	7.3	18.1	11.5	25.7	26.0
LnGrp LOS	B	A	B	B	C	C
Approach Vol, veh/h		627	636		500	
Approach Delay, s/veh		8.4	17.0		25.9	
Approach LOS		A	B		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.3	40.7			53.0	22.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	8.0	33.0			47.0	16.0
Max Q Clear Time (g_c+I1), s	6.2	18.7			10.3	16.5
Green Ext Time (p_c), s	0.1	2.2			1.5	0.0

Intersection Summary

HCM 6th Ctrl Delay	16.5
HCM 6th LOS	B

APPENDIX L8

2026 NO BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 No Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	403	79	81	360	143	139
Future Volume (vph)	403	79	81	360	143	139
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1681	0	1662	1766	1535	0
Flt Permitted			0.257		0.975	
Satd. Flow (perm)	1681	0	450	1766	1535	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	17					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	536	0	90	400	313	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.7		42.4	41.2	18.4	
Actuated g/C Ratio	0.45		0.61	0.59	0.26	
v/c Ratio	0.70		0.22	0.38	0.78	
Control Delay	22.5		5.3	6.4	39.4	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	22.5		5.3	6.4	39.4	
LOS	C		A	A	D	
Approach Delay	22.5			6.2	39.4	
Approach LOS	C			A	D	
Queue Length 50th (ft)	185		12	56	124	
Queue Length 95th (ft)	#342		m22	79	#242	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	771		411	1040	412	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.70		0.22	0.38	0.76	

Intersection Summary

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 20.5	Intersection LOS: C
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

 Ø1 12 s	 Ø2 (R) 34 s	 Ø4 24 s
 Ø6 (R) 46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2026 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	👉		👈	👈	👉	
Traffic Volume (veh/h)	403	79	81	360	143	139
Future Volume (veh/h)	403	79	81	360	143	139
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	448	82	90	400	159	154
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	656	120	445	1184	195	189
Arrive On Green	0.48	0.47	0.15	1.00	0.24	0.22
Sat Flow, veh/h	1355	248	1846	1927	825	799
Grp Volume(v), veh/h	0	530	90	400	314	0
Grp Sat Flow(s),veh/h/ln	0	1603	1846	1927	1628	0
Q Serve(g_s), s	0.0	17.9	1.4	0.0	12.8	0.0
Cycle Q Clear(g_c), s	0.0	17.9	1.4	0.0	12.8	0.0
Prop In Lane		0.15	1.00		0.51	0.49
Lane Grp Cap(c), veh/h	0	776	445	1184	386	0
V/C Ratio(X)	0.00	0.68	0.20	0.34	0.81	0.00
Avail Cap(c_a), veh/h	0	776	521	1184	437	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	14.0	8.7	0.0	25.5	0.0
Incr Delay (d2), s/veh	0.0	4.8	0.2	0.8	15.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	10.8	0.8	0.5	10.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.8	8.9	0.8	40.7	0.0
LnGrp LOS	A	B	A	A	D	A
Approach Vol, veh/h	530			490	314	
Approach Delay, s/veh	18.8			2.3	40.7	
Approach LOS	B			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.1	39.1		21.8		48.2
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.4	19.9		14.8		2.0
Green Ext Time (p_c), s	0.1	4.8		0.8		10.3
Intersection Summary						
HCM 6th Ctrl Delay			17.9			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	571	1	0	535	41	0	0	2	41	0	35
Future Volume (vph)	26	571	1	0	535	41	0	0	2	41	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	643	0	0	647	0	0	2	0	46	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 46.4% ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	571	1	0	535	41	0	0	2	41	0	35
Future Vol, veh/h	26	571	1	0	535	41	0	0	2	41	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	29	642	1	0	601	46	0	0	2	46	0	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	647	0	0	643	0	0	1346	1348	644	1327	1325	625
Stage 1	-	-	-	-	-	-	701	701	-	624	624	-
Stage 2	-	-	-	-	-	-	645	647	-	703	701	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	751	-	-	580	-	-	163	177	424	181	196	480
Stage 1	-	-	-	-	-	-	522	480	-	593	534	-
Stage 2	-	-	-	-	-	-	559	505	-	542	499	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	751	-	-	580	-	-	145	170	424	175	188	480
Mov Cap-2 Maneuver	-	-	-	-	-	-	145	170	-	175	188	-
Stage 1	-	-	-	-	-	-	502	461	-	570	534	-
Stage 2	-	-	-	-	-	-	513	505	-	518	480	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	13.5	23.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	424	751	-	-	580	-	-	175	480
HCM Lane V/C Ratio	0.005	0.039	-	-	-	-	-	0.263	0.082
HCM Control Delay (s)	13.5	10	-	-	0	-	-	32.8	13.2
HCM Lane LOS	B	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	482	44	62	466	6	102	2	72	4	3	2
Future Volume (vph)	3	482	44	62	466	6	102	2	72	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.472			0.346			0.754			0.704		
Satd. Flow (perm)	821	1667	1552	561	1558	1608	1302	1516	0	1305	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45		80			2	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	536	49	69	518	7	113	82	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	44.6	44.6	44.6	52.3	52.1	52.1	10.8	10.8		10.6	10.6	
Actuated g/C Ratio	0.64	0.64	0.64	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.50	0.05	0.13	0.45	0.01	0.56	0.27		0.02	0.02	
Control Delay	6.7	7.9	0.1	1.5	3.0	0.0	38.5	9.8		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	7.9	0.1	1.5	3.0	0.0	38.5	9.8		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		7.2			2.8			26.4			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	82	0	7	59	0	45	1		1	1	
Queue Length 95th (ft)	m1	m116	m0	2	11	m0	92	34		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	523	1062	1036	537	1160	1208	225	328		225	320	
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	0.01	0.50	0.05	0.13	0.45	0.01	0.50	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.1

Intersection LOS: A

Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	482	44	62	466	6	102	2	72	4	3	2
Future Volume (veh/h)	3	482	44	62	466	6	102	2	72	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	536	33	69	518	6	113	2	42	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	694	1189	1052	660	1168	1119	280	9	195	257	143	95
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	968	1947	1722	1640	1609	1542	1460	77	1611	1469	1175	784
Grp Volume(v), veh/h	3	536	33	69	518	6	113	0	44	4	0	5
Grp Sat Flow(s),veh/h/ln	968	1947	1722	1640	1609	1542	1460	0	1687	1469	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	5.2	0.0	1.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.9	0.0	0.0	5.2	0.0	1.7	1.3	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.40
Lane Grp Cap(c), veh/h	694	1189	1052	660	1168	1119	280	0	205	257	0	238
V/C Ratio(X)	0.00	0.45	0.03	0.10	0.44	0.01	0.40	0.00	0.21	0.02	0.00	0.02
Avail Cap(c_a), veh/h	694	1189	1052	776	1168	1119	355	0	292	332	0	339
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(l)	1.00	1.00	1.00	0.93	0.93	0.93	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.2	0.0	0.0	29.3	0.0	28.2	28.1	0.0	27.3
Incr Delay (d2), s/veh	0.0	1.2	0.1	0.1	1.1	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.7	0.0	0.3	0.7	0.0	3.3	0.0	1.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.2	0.1	3.3	1.1	0.0	30.2	0.0	28.7	28.2	0.0	27.3
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	572			593			157			9		
Approach Delay, s/veh	1.2			1.4			29.8			27.7		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.1	48.5	13.4		56.6		13.4					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.4	2.5	3.8		2.5		7.7					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.8
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	408	13	5	501	12	9	0	14	6	0	8
Future Volume (vph)	26	408	13	5	501	12	9	0	14	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1659	0	1744	1654	1445	0	1729	0	1719	1501	0
Flt Permitted	0.391			0.501				0.866				
Satd. Flow (perm)	690	1659	0	920	1654	1415	0	1526	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				126		139			412	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	453	0	5	539	13	0	25	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.30		0.01	0.39	0.01		0.09		0.03	0.02	
Control Delay	0.9	2.3		3.8	5.1	0.0		0.7		28.5	0.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.9	2.3		3.8	5.1	0.0		0.7		28.5	0.0	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.2			5.0			0.7			11.4	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m2	64		m2	174	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	689	1492		769	1383	1204		325		242	558	
Starvation Cap Reductn	0	0		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	0.04	0.30		0.01	0.39	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 3.7

Intersection LOS: A

Intersection Capacity Utilization 44.3%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2026 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	408	13	5	501	12	9	0	14	6	0	8
Future Volume (veh/h)	26	408	13	5	501	12	9	0	14	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	28	439	14	5	539	13	10	0	14	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	722	1286	41	810	1297	1125	89	0	22	159	68	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1567	50	977	1793	1554	426	0	596	1361	1837	0
Grp Volume(v), veh/h	28	0	453	5	539	13	24	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1617	977	1793	1554	1021	0	0	1361	1837	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.42		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	722	0	1327	810	1297	1125	96	0	0	159	68	0
V/C Ratio(X)	0.04	0.00	0.34	0.01	0.42	0.01	0.25	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	820	0	1327	810	1297	1125	241	0	0	291	247	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)	0.86	0.00	0.86	0.93	0.93	0.93	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	0.0	0.0	0.0	0.0	0.0	34.0	0.0	0.0	32.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.0	0.9	0.0	1.3	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.4	0.0	0.6	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.6	0.0	0.9	0.0	35.3	0.0	0.0	32.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	481			557			24			6		
Approach Delay, s/veh	0.7			0.9			35.3			32.7		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.8	56.0	7.2		62.8		7.2					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.8	2.5	2.7		2.5		3.6					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.5		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				1.7								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	379	1	10	404	24	59	27	36	28	15	47
Future Volume (vph)	38	379	1	10	404	24	59	27	36	28	15	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1592	0	1248	1497	0	0	1792	0
Flt Permitted	0.479			0.513			0.766				0.871	
Satd. Flow (perm)	849	1685	0	673	1592	0	1006	1497	0	0	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			39			51	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	409	0	11	460	0	63	68	0	0	97	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.4	52.4		52.4	52.4		11.0	11.0			11.0	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.06	0.32		0.02	0.39		0.40	0.25			0.33	
Control Delay	1.1	1.6		4.4	5.9		32.9	15.4			16.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.6		4.4	5.9		32.9	15.4			16.7	
LOS	A	A		A	A		C	B			B	
Approach Delay		1.5			5.8			23.8			16.7	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	7		1	65		25	11			18	
Queue Length 95th (ft)	3	17		7	145		55	40			52	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	635	1261		503	1194		287	455			488	
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	0.06	0.32		0.02	0.39		0.22	0.15			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 7.1

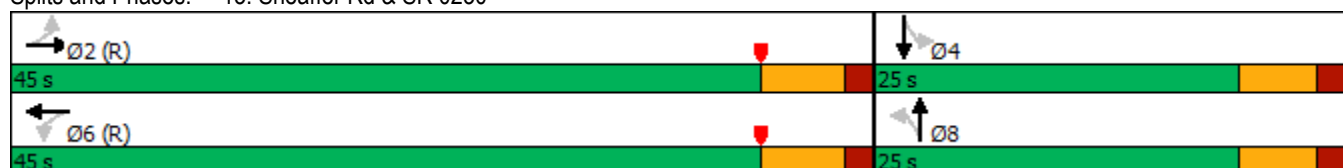
Intersection LOS: A

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2026 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	379	1	10	404	24	59	27	36	28	15	47
Future Volume (veh/h)	38	379	1	10	404	24	59	27	36	28	15	47
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		0.99	1.00		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	41	408	0	11	434	25	63	29	17	30	16	33
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	696	1278	0	694	1302	75	217	97	57	112	43	61
Arrive On Green	1.00	1.00	0.00	0.76	0.76	0.75	0.10	0.10	0.08	0.08	0.10	0.08
Sat Flow, veh/h	873	1680	0	776	1710	99	1001	999	585	424	443	622
Grp Volume(v), veh/h	41	408	0	11	0	459	63	0	46	79	0	0
Grp Sat Flow(s),veh/h/ln	873	1680	0	776	0	1809	1001	0	1584	1490	0	0
Q Serve(g_s), s	0.4	0.0	0.0	0.2	0.0	5.7	0.0	0.0	1.9	1.9	0.0	0.0
Cycle Q Clear(g_c), s	6.1	0.0	0.0	0.2	0.0	5.7	3.2	0.0	1.9	3.8	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.05	1.00		0.37	0.38		0.42
Lane Grp Cap(c), veh/h	696	1278	0	694	0	1377	217	0	154	195	0	0
V/C Ratio(X)	0.06	0.32	0.00	0.02	0.00	0.33	0.29	0.00	0.30	0.41	0.00	0.00
Avail Cap(c_a), veh/h	696	1278	0	694	0	1377	406	0	453	507	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(l)	0.96	0.96	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.3	0.0	0.0	2.0	0.0	2.7	29.9	0.0	29.5	30.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.6	0.0	0.0	0.0	0.7	0.7	0.0	1.1	1.4	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(95%),veh/ln	0.1	0.4	0.0	0.0	0.0	1.9	1.8	0.0	1.3	2.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	0.6	0.0	2.1	0.0	3.3	30.7	0.0	30.6	32.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	449			470			109			79		
Approach Delay, s/veh	0.6			3.3			30.6			32.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	58.2			11.8			58.2			11.8		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			5.8			7.7			5.2		
Green Ext Time (p_c), s	11.7			0.1			12.9			0.3		

Intersection Summary

HCM 6th Ctrl Delay	7.0
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	324	0	88	526	138	0	0	188	56
Future Volume (vph)	0	0	0	324	0	88	526	138	0	0	188	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.476					
Satd. Flow (perm)	0	0	0	0	1546	1145	774	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	338	92	548	144	0	0	196	58
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					15.7	15.7	32.6	32.6			15.6	15.6
Actuated g/C Ratio					0.27	0.27	0.56	0.56			0.27	0.27
v/c Ratio					0.81	0.21	0.92	0.18			0.48	0.11
Control Delay					37.8	1.9	35.0	7.0			22.4	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					37.8	1.9	35.0	7.0			22.4	0.4
LOS					D	A	C	A			C	A
Approach Delay					30.1			29.2			17.4	
Approach LOS					C			C			B	
Queue Length 50th (ft)					113	0	118	22			58	0
Queue Length 95th (ft)					#235	8	#326	46			111	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					442	444	597	839			450	558
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					0.76	0.21	0.92	0.17			0.44	0.10

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 57.8

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 27.3

Intersection LOS: C

Intersection Capacity Utilization 87.4%

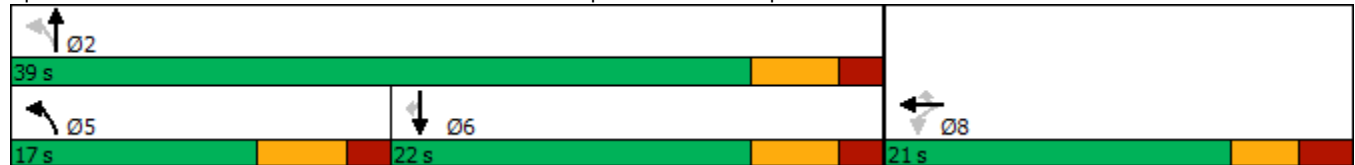
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶	↷			↷	↶
Traffic Volume (veh/h)	0	0	0	324	0	88	526	138	0	0	188	56
Future Volume (veh/h)	0	0	0	324	0	88	526	138	0	0	188	56
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				338	0	0	548	144	0	0	196	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				439	0		666	850	0	0	412	
Arrive On Green				0.23	0.00	0.00	0.23	0.57	0.00	0.00	0.25	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				338	0	0	548	144	0	0	196	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				9.3	0.0	0.0	12.0	2.4	0.0	0.0	5.3	0.0
Cycle Q Clear(g_c), s				9.3	0.0	0.0	12.0	2.4	0.0	0.0	5.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				439	0		666	850	0	0	412	
V/C Ratio(X)				0.77	0.00		0.82	0.17	0.00	0.00	0.48	
Avail Cap(c_a), veh/h				563	0		666	963	0	0	539	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.9	0.0	0.0	10.9	5.3	0.0	0.0	16.8	0.0
Incr Delay (d2), s/veh				4.9	0.0	0.0	8.2	0.3	0.0	0.0	3.1	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
%ile BackOfQ(50%),veh/ln				4.2	0.0	0.0	4.6	0.5	0.0	0.0	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.8	0.0	0.0	19.1	5.6	0.0	0.0	19.8	0.0
LnGrp LOS				C	A		B	A	A	A	B	
Approach Vol, veh/h					338			692			196	
Approach Delay, s/veh					23.8			16.3			19.8	
Approach LOS					C			B			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		17.4				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		4.4			14.0	7.3		11.3				
Green Ext Time (p_c), s		3.1			0.0	2.0		0.7				
Intersection Summary												
HCM 6th Ctrl Delay				18.9								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2	238	0	0	0	0	632	570	108	397	0
Future Volume (vph)	32	2	238	0	0	0	0	632	570	108	397	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	253	0	0	0	0	1278	0	115	422	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 87.4%

ICU Level of Service E

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2026 No Build
AM Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	32	2	238	0	0	0	0	632	570	108	397	0
Future Vol, veh/h	32	2	238	0	0	0	0	632	570	108	397	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	34	2	253	0	0	0	0	672	606	115	422	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1324	1324	422	-	0	0	672	0	0
Stage 1	652	652	-	-	-	-	-	-	-
Stage 2	672	672	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	166	196	669	0	-	-	725	-	0
Stage 1	618	521	-	0	-	-	-	-	0
Stage 2	606	512	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	140	0	669	-	-	-	725	-	-
Mov Cap-2 Maneuver	140	0	-	-	-	-	-	-	-
Stage 1	618	0	-	-	-	-	-	-	-
Stage 2	510	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	140	669	725	-
HCM Lane V/C Ratio	-	-	0.258	0.378	0.158	-
HCM Control Delay (s)	-	-	39.4	13.6	10.9	-
HCM Lane LOS	-	-	E	B	B	-
HCM 95th %tile Q(veh)	-	-	1	1.8	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 No Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	25	0	1184	627	5
Future Volume (vph)	6	25	0	1184	627	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1622	0	0	1734	1653	0
Flt Permitted	0.990					
Satd. Flow (perm)	1622	0	0	1734	1653	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	1316	703	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	72.3%			ICU Level of Service C		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 No Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	0	1184	627	5
Future Vol, veh/h	6	25	0	1184	627	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	28	0	1316	697	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2016	700	703	0	-	0
Stage 1	700	-	-	-	-	-
Stage 2	1316	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	69	463	740	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	274	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	69	463	740	-	-	-
Mov Cap-2 Maneuver	69	-	-	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	274	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	24.4	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	740	-	220	-	-	
HCM Lane V/C Ratio	-	-	0.157	-	-	
HCM Control Delay (s)	0	-	24.4	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0.5	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	340	19	89	8	12	75	32	770	8	10	504	150
Future Volume (vph)	340	19	89	8	12	75	32	770	8	10	504	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1575	0	1391	1563	0	1500	1615	0	1628	1575	0
Flt Permitted	0.695			0.680			0.240			0.145		
Satd. Flow (perm)	1173	1575	0	994	1563	0	379	1615	0	248	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		99			83			1			35	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	378	120	0	9	96	0	36	865	0	11	727	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.13	0.23		0.03	0.19		0.17	0.95		0.08	0.80	
Control Delay	116.5	7.5		18.6	7.4		7.9	31.9		8.7	20.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	116.5	7.5		18.6	7.4		7.9	31.9		8.7	20.5	
LOS	F	A		B	A		A	C		A	C	
Approach Delay		90.2			8.3			30.9			20.3	
Approach LOS		F			A			C			C	
Queue Length 50th (ft)	~193	7		3	4		4	327		2	216	
Queue Length 95th (ft)	#347	42		13	35		m9	#579		9	#442	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	335	520		284	505		213	911		139	904	
Starvation Cap Reductn	0	0		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	1.13	0.23		0.03	0.19		0.17	0.95		0.08	0.80	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 39.6

Intersection LOS: D

Intersection Capacity Utilization 78.6%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

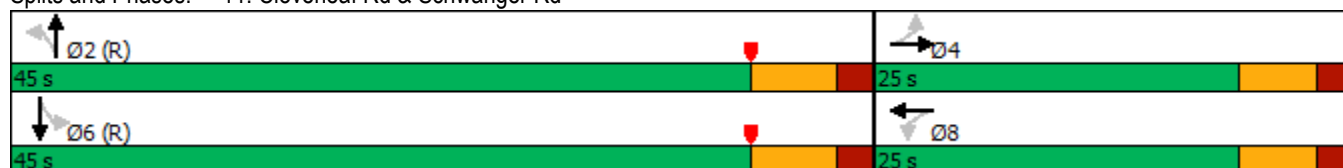
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2026 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	19	89	8	12	75	32	770	8	10	504	150
Future Volume (veh/h)	340	19	89	8	12	75	32	770	8	10	504	150
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	378	21	99	9	13	83	36	856	9	11	560	167
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	422	90	423	352	57	363	277	994	10	479	754	225
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1359	314	1482	1064	199	1272	699	1762	19	666	1337	399
Grp Volume(v), veh/h	378	0	120	9	0	96	36	0	865	11	0	727
Grp Sat Flow(s),veh/h/ln	1359	0	1796	1064	0	1471	699	0	1780	666	0	1735
Q Serve(g_s), s	16.5	0.0	3.6	0.5	0.0	3.5	2.2	0.0	0.0	0.5	0.0	22.1
Cycle Q Clear(g_c), s	20.0	0.0	3.6	4.1	0.0	3.5	24.3	0.0	0.0	0.5	0.0	22.1
Prop In Lane	1.00		0.82	1.00		0.86	1.00		0.01	1.00		0.23
Lane Grp Cap(c), veh/h	422	0	513	352	0	420	277	0	1005	479	0	979
V/C Ratio(X)	0.90	0.00	0.23	0.03	0.00	0.23	0.13	0.00	0.86	0.02	0.00	0.74
Avail Cap(c_a), veh/h	422	0	513	352	0	420	277	0	1005	479	0	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.74	0.00	0.74	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	19.5	20.7	0.0	19.5	6.8	0.0	0.0	6.8	0.0	11.5
Incr Delay (d2), s/veh	21.0	0.0	0.2	0.0	0.0	0.3	0.7	0.0	7.3	0.1	0.0	5.1
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	8.6	0.0	1.4	0.1	0.0	1.2	0.3	0.0	2.1	0.1	0.0	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.1	0.0	19.7	20.7	0.0	19.7	7.5	0.0	7.3	6.8	0.0	16.6
LnGrp LOS	D	A	B	C	A	B	A	A	A	A	A	B
Approach Vol, veh/h	498			105			901			738		
Approach Delay, s/veh	42.0			19.8			7.4			16.5		
Approach LOS	D			B			A			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			24.1			6.1		
Green Ext Time (p_c), s	28.0			0.0			11.3			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	18.6											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	16	16	1	9	2	773	7	25	554	7
Future Volume (vph)	35	0	16	16	1	9	2	773	7	25	554	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1682	0	0	1561	0	0	1615	1648
Flt Permitted		0.740			0.787			0.999			0.955	
Satd. Flow (perm)	0	1288	1581	0	1366	0	0	1559	0	0	1545	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		9			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	17	0	27	0	0	814	0	0	603	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		8.6	8.6		8.5			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.23	0.07		0.16			0.63			0.47	0.01
Control Delay		30.4	2.4		22.5			7.3			8.1	0.4
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		30.4	2.4		22.5			7.3			8.1	0.4
LOS		C	A		C			A			A	A
Approach Delay		21.5			22.5			7.3			8.0	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		14	0		7			141			165	0
Queue Length 95th (ft)		38	4		27			318			m260	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		230	320		251			1301			1289	1382
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		0.16	0.05		0.11			0.63			0.47	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 8.4

Intersection LOS: A

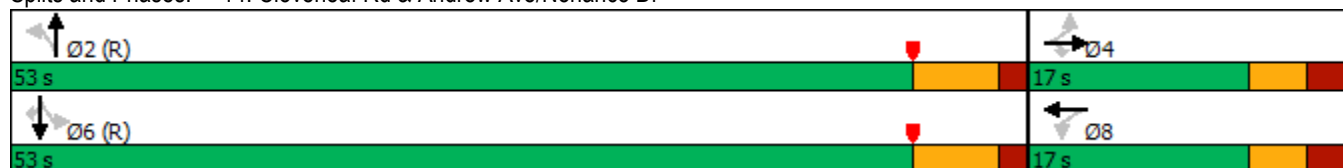
Intersection Capacity Utilization 68.9%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	16	16	1	9	2	773	7	25	554	7
Future Volume (veh/h)	35	0	16	16	1	9	2	773	7	25	554	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	36	0	17	17	1	9	2	805	7	26	577	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	205	0	101	119	8	21	52	1296	11	79	1327	1322
Arrive On Green	0.05	0.00	0.06	0.05	0.06	0.05	0.79	0.80	0.79	1.00	1.00	1.00
Sat Flow, veh/h	1601	0	1586	545	120	333	1	1619	14	32	1658	1652
Grp Volume(v), veh/h	36	0	17	27	0	0	814	0	0	603	0	7
Grp Sat Flow(s),veh/h/ln	1601	0	1586	998	0	0	1634	0	0	1690	0	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.7	2.4	0.0	0.0	14.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.63		0.33	0.00		0.01	0.04		1.00
Lane Grp Cap(c), veh/h	182	0	101	133	0	0	1336	0	0	1382	0	1322
V/C Ratio(X)	0.20	0.00	0.17	0.20	0.00	0.00	0.61	0.00	0.00	0.44	0.00	0.01
Avail Cap(c_a), veh/h	337	0	283	302	0	0	1336	0	0	1382	0	1322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.51	0.00	0.51
Uniform Delay (d), s/veh	31.8	0.0	31.0	32.5	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	0.7	0.0	0.0	2.1	0.0	0.0	0.5	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	0.6	0.0	0.3	0.5	0.0	0.0	2.1	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	0.0	31.8	33.3	0.0	0.0	4.9	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	53		27				814			610		
Approach Delay, s/veh	32.2		33.3				4.9			0.5		
Approach LOS	C		C				A			A		
Timer - Assigned Phs	2		4				6			8		
Phs Duration (G+Y+Rc), s	61.0		9.0				61.0			9.0		
Change Period (Y+Rc), s	6.0		5.5				6.0			5.5		
Max Green Setting (Gmax), s	47.0		11.5				47.0			11.5		
Max Q Clear Time (g_c+I1), s	16.1		3.4				2.0			4.4		
Green Ext Time (p_c), s	22.6		0.1				21.1			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	4.6											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	192	38	3	175	201	73	364	11	107	228	208
Future Volume (vph)	265	192	38	3	175	201	73	364	11	107	228	208
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1716	0	1500	1509	1388
Flt Permitted	0.423			0.630			0.540			0.284		
Satd. Flow (perm)	661	1660	1088	790	1649	1561	931	1716	0	448	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		2				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	282	204	40	3	186	214	78	399	0	114	243	221
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	29.8	29.8	29.8	14.5	14.5	14.5	26.2	20.2		26.3	20.3	20.3
Actuated g/C Ratio	0.41	0.41	0.41	0.20	0.20	0.20	0.36	0.28		0.36	0.28	0.28
v/c Ratio	0.74	0.30	0.07	0.02	0.56	0.42	0.19	0.83		0.41	0.57	0.40
Control Delay	31.9	17.4	0.3	25.0	35.2	5.8	13.5	42.5		17.5	29.9	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	31.9	17.4	0.3	25.0	35.2	5.8	13.5	42.5		17.5	29.9	5.5
LOS	C	B	A	C	D	A	B	D		B	C	A
Approach Delay		23.9			19.5			37.8			18.1	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	99	66	0	1	81	0	19	171		29	96	0
Queue Length 95th (ft)	#200	116	0	8	144	41	47	#346		65	181	46

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	383	772	586	200	418	574	417	521		281	459	583
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.74	0.26	0.07	0.01	0.44	0.37	0.19	0.77		0.41	0.53	0.38

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 24.7

Intersection LOS: C

Intersection Capacity Utilization 71.8%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	192	38	3	175	201	73	364	11	107	228	208
Future Volume (veh/h)	265	192	38	3	175	201	73	364	11	107	228	208
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	282	204	27	3	186	0	78	387	10	114	243	191
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	435	700	494	261	329		375	482	12	305	412	365
Arrive On Green	0.14	0.41	0.41	0.19	0.19	0.00	0.07	0.24	0.23	0.09	0.27	0.27
Sat Flow, veh/h	1641	1709	1206	817	1724	1532	1988	2006	52	1522	1528	1352
Grp Volume(v), veh/h	282	204	27	3	186	0	78	0	397	114	243	191
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	817	1724	1532	1988	0	2058	1522	1528	1352
Q Serve(g_s), s	9.0	5.5	0.9	0.2	6.7	0.0	1.9	0.0	12.5	3.7	9.5	8.2
Cycle Q Clear(g_c), s	9.0	5.5	0.9	0.2	6.7	0.0	1.9	0.0	12.5	3.7	9.5	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	435	700	494	261	329		375	0	494	305	412	365
V/C Ratio(X)	0.65	0.29	0.05	0.01	0.57		0.21	0.00	0.80	0.37	0.59	0.52
Avail Cap(c_a), veh/h	435	823	581	319	453		477	0	645	338	479	424
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.5	13.6	12.2	22.5	25.2	0.0	17.6	0.0	24.5	17.6	21.7	21.3
Incr Delay (d2), s/veh	3.3	0.1	0.0	0.0	0.6	0.0	0.3	0.0	5.6	0.8	1.4	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	3.3	1.8	0.2	0.0	2.5	0.0	0.9	0.0	6.6	1.2	3.2	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	13.6	12.2	22.5	25.7	0.0	17.9	0.0	30.1	18.3	23.1	22.4
LnGrp LOS	C	B	B	C	C		B	A	C	B	C	C
Approach Vol, veh/h	513			189			475			548		
Approach Delay, s/veh	17.5			25.7			28.1			21.9		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	12.5	22.5		33.6	10.5	24.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	11.5	9.2	6.2	14.5		8.0	4.4	12.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0		0.1	0.0	1.5				

Intersection Summary

HCM 6th Ctrl Delay	22.7
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2026 No Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	283	380	24	26	3
Future Volume (vph)	3	283	380	24	26	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1723	0	1554	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1723	0	1554	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	311	444	0	32	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 31.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	283	380	24	26	3
Future Vol, veh/h	3	283	380	24	26	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	311	418	26	29	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	444	0	0 748 431
Stage 1	-	-	- 431 -
Stage 2	-	-	- 317 -
Critical Hdwy	4.4	-	- 6.84 6.7
Critical Hdwy Stg 1	-	-	- 5.84 -
Critical Hdwy Stg 2	-	-	- 5.84 -
Follow-up Hdwy	3.3	-	- 3 3.4
Pot Cap-1 Maneuver	772	-	- 389 578
Stage 1	-	-	- 710 -
Stage 2	-	-	- 816 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	772	-	- 387 578
Mov Cap-2 Maneuver	-	-	- 521 -
Stage 1	-	-	- 707 -
Stage 2	-	-	- 816 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	772	-	-	-	526
HCM Lane V/C Ratio	0.004	-	-	-	0.061
HCM Control Delay (s)	9.7	-	-	-	12.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2026 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	23	34	6	43	112	46	305	9	26	169	73
Future Volume (vph)	62	23	34	6	43	112	46	305	9	26	169	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1310	0	0	1540	0	0	1664	0	0	1508	0
Flt Permitted		0.974			0.998			0.994			0.995	
Satd. Flow (perm)	0	1310	0	0	1540	0	0	1664	0	0	1508	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	124	0	0	168	0	0	375	0	0	279	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	53.7%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	13.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	62	23	34	6	43	112	46	305	9	26	169	73
Future Vol, veh/h	62	23	34	6	43	112	46	305	9	26	169	73
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	65	24	35	6	45	117	48	318	9	27	176	76
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12	10.7	16.1	13.6
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	52%	4%	10%
Vol Thru, %	85%	19%	27%	63%
Vol Right, %	3%	29%	70%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	360	119	161	268
LT Vol	46	62	6	26
Through Vol	305	23	43	169
RT Vol	9	34	112	73
Lane Flow Rate	375	124	168	279
Geometry Grp	1	1	1	1
Degree of Util (X)	0.58	0.235	0.262	0.452
Departure Headway (Hd)	5.568	6.835	5.617	5.825
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	645	523	636	617
Service Time	3.619	4.908	3.684	3.881
HCM Lane V/C Ratio	0.581	0.237	0.264	0.452
HCM Control Delay	16.1	12	10.7	13.6
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	3.7	0.9	1	2.3

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 No Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	658	86	194	493	124	126
Future Volume (vph)	658	86	194	493	124	126
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1799	0	1744	1958	1583	0
Flt Permitted			0.106		0.976	
Satd. Flow (perm)	1799	0	195	1958	1583	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	12					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	818	0	213	542	274	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	0.89		0.74	0.42	0.83	
Control Delay	31.1		25.0	7.5	52.5	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	31.1		25.0	7.5	52.5	
LOS	C		C	A	D	
Approach Delay	31.1			12.4	52.5	
Approach LOS	C			B	D	
Queue Length 50th (ft)	341		35	121	132	
Queue Length 95th (ft)	#590		m76	m152	#259	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	923		286	1292	332	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.89		0.74	0.42	0.83	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 26.6	Intersection LOS: C
Intersection Capacity Utilization 80.8%	ICU Level of Service D
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	46 s	22 s
↖ Ø6 (R)		
58 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2026 No Build
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	658	86	194	493	124	126
Future Volume (veh/h)	658	86	194	493	124	126
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	723	86	213	542	136	138
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	817	97	336	1402	164	167
Arrive On Green	0.54	0.52	0.17	1.00	0.20	0.19
Sat Flow, veh/h	1522	181	1914	2090	825	837
Grp Volume(v), veh/h	0	809	213	542	275	0
Grp Sat Flow(s),veh/h/ln	0	1703	1914	2090	1668	0
Q Serve(g_s), s	0.0	33.5	3.7	0.0	12.7	0.0
Cycle Q Clear(g_c), s	0.0	33.5	3.7	0.0	12.7	0.0
Prop In Lane		0.11	1.00		0.49	0.50
Lane Grp Cap(c), veh/h	0	914	336	1402	332	0
V/C Ratio(X)	0.00	0.88	0.63	0.39	0.83	0.00
Avail Cap(c_a), veh/h	0	914	367	1402	350	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	16.4	14.7	0.0	31.0	0.0
Incr Delay (d2), s/veh	0.0	12.2	3.1	0.8	19.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	20.4	3.7	0.6	10.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	28.6	17.9	0.8	50.1	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	809			755	275	
Approach Delay, s/veh	28.6			5.6	50.1	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.7	48.2		21.1		58.9
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	5.7	35.5		14.7		2.0
Green Ext Time (p_c), s	0.1	3.6		0.3		16.8
Intersection Summary						
HCM 6th Ctrl Delay			22.4			
HCM 6th LOS			C			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	818	0	0	962	85	1	0	2	30	0	48
Future Volume (vph)	28	818	0	0	962	85	1	0	2	30	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	880	0	0	1125	0	0	3	0	32	52	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 66.9%

ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	818	0	0	962	85	1	0	2	30	0	48
Future Vol, veh/h	28	818	0	0	962	85	1	0	2	30	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	30	880	0	0	1034	91	1	0	2	32	0	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1125	0	0	880	0	0	2047	2065	880	2021	2020	1081
Stage 1	-	-	-	-	-	-	940	940	-	1080	1080	-
Stage 2	-	-	-	-	-	-	1107	1125	-	941	940	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	582	-	-	441	-	-	55	69	382	65	82	303
Stage 1	-	-	-	-	-	-	391	383	-	350	355	-
Stage 2	-	-	-	-	-	-	318	320	-	411	403	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	582	-	-	441	-	-	44	65	382	62	78	303
Mov Cap-2 Maneuver	-	-	-	-	-	-	44	65	-	62	78	-
Stage 1	-	-	-	-	-	-	371	363	-	332	355	-
Stage 2	-	-	-	-	-	-	264	320	-	388	382	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	39.7	55.7
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	107	582	-	-	441	-	-	62	303
HCM Lane V/C Ratio	0.03	0.052	-	-	-	-	-	0.52	0.17
HCM Control Delay (s)	39.7	11.5	-	-	0	-	-	114	19.3
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	2.1	0.6

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	619	37	153	759	17	270	3	117	24	8	16
Future Volume (vph)	14	619	37	153	759	17	270	3	117	24	8	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1747	0
Flt Permitted	0.322			0.198			0.741			0.677		
Satd. Flow (perm)	560	1766	1550	328	1697	1608	1316	1576	0	1255	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40			122			17
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	645	39	159	791	18	281	125	0	25	25	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.7	37.7	37.7	51.8	50.5	50.5	18.8	18.8		18.8	18.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.65	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.06	0.78	0.05	0.47	0.74	0.02	0.91	0.27		0.08	0.06	
Control Delay	11.6	17.4	0.2	8.5	6.7	0.1	64.7	7.1		24.7	14.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.6	17.4	0.2	8.5	6.7	0.1	64.7	7.1		24.7	14.4	
LOS	B	B	A	A	A	A	E	A		C	B	
Approach Delay		16.3			6.9			46.9			19.5	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	3	117	0	4	26	0	136	1		10	3	
Queue Length 95th (ft)	m5	m183	m0	m29	55	m0	#277	41		29	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	263	832	791	344	1070	1029	314	469		299	430	
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	0.06	0.78	0.05	0.46	0.74	0.02	0.89	0.27		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 18.0

Intersection LOS: B

Intersection Capacity Utilization 90.9%

ICU Level of Service E

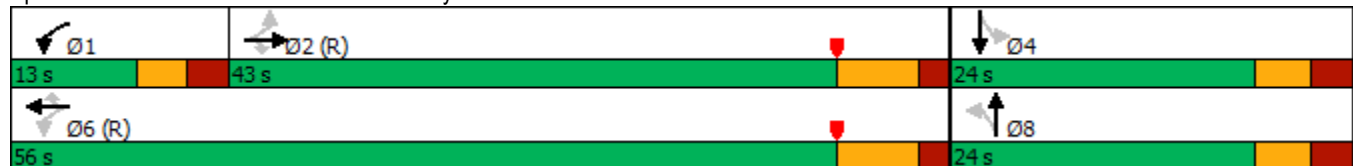
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	619	37	153	759	17	270	3	117	24	8	16
Future Volume (veh/h)	14	619	37	153	759	17	270	3	117	24	8	16
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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	15	645	24	159	791	15	281	3	82	25	8	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	459	1006	864	580	1103	980	425	14	375	367	158	276
Arrive On Green	0.99	0.99	0.99	0.17	1.00	1.00	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	745	2032	1745	1666	1736	1542	1470	59	1625	1415	685	1198
Grp Volume(v), veh/h	15	645	24	159	791	15	281	0	85	25	0	22
Grp Sat Flow(s),veh/h/ln	745	2032	1745	1666	1736	1542	1470	0	1685	1415	0	1882
Q Serve(g_s), s	0.0	0.7	0.0	3.3	0.0	0.0	14.6	0.0	3.3	1.2	0.0	0.7
Cycle Q Clear(g_c), s	0.0	0.7	0.0	3.3	0.0	0.0	14.8	0.0	3.3	4.0	0.0	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.64
Lane Grp Cap(c), veh/h	459	1006	864	580	1103	980	425	0	389	367	0	434
V/C Ratio(X)	0.03	0.64	0.03	0.27	0.72	0.02	0.66	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	459	1006	864	617	1103	980	437	0	402	378	0	449
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(l)	1.00	1.00	1.00	0.73	0.73	0.73	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.2	0.2	0.2	6.2	0.0	0.0	29.5	0.0	25.3	26.4	0.0	24.2
Incr Delay (d2), s/veh	0.1	3.1	0.1	0.2	3.0	0.0	3.6	0.0	0.3	0.1	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(95%),veh/ln	0.0	1.8	0.0	1.6	1.6	0.0	9.3	0.0	2.4	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.3	3.3	0.3	6.4	3.0	0.0	33.1	0.0	25.6	26.4	0.0	24.3
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	684				965				366			
Approach Delay, s/veh	3.2				3.5				31.3			
Approach LOS	A				A				C			
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	11.2	45.4	23.4			56.6		23.4				
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8		* 5.9				
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2		* 18				
Max Q Clear Time (g_c+I1), s	5.8	3.2	6.5			2.5		17.3				
Green Ext Time (p_c), s	0.1	0.8	0.1			1.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay 8.8
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	446	1	10	764	74	9	2	1	42	3	113
Future Volume (vph)	85	446	1	10	764	74	9	2	1	42	3	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.223			0.494				0.721		0.750		
Satd. Flow (perm)	393	1729	0	825	1818	1561	0	1364	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			119	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	470	0	11	804	78	0	12	0	44	122	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.9	64.1		55.3	55.3	55.3		9.2		9.2	9.2	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.21	0.34		0.02	0.64	0.07		0.08		0.28	0.44	
Control Delay	3.6	5.8		4.8	11.6	0.6		30.0		36.2	12.2	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0		0.0	0.0	
Total Delay	3.6	5.8		4.8	11.7	0.6		30.0		36.2	12.2	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		5.5			10.6			30.0			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	10	123		1	300	0		5		21	1	
Queue Length 95th (ft)	m17	m202		m3	408	m1		19		49	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	418	1386		570	1257	1113		229		227	351	
Starvation Cap Reductn	0	0		0	41	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	0.21	0.34		0.02	0.66	0.07		0.05		0.19	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 9.8

Intersection LOS: A

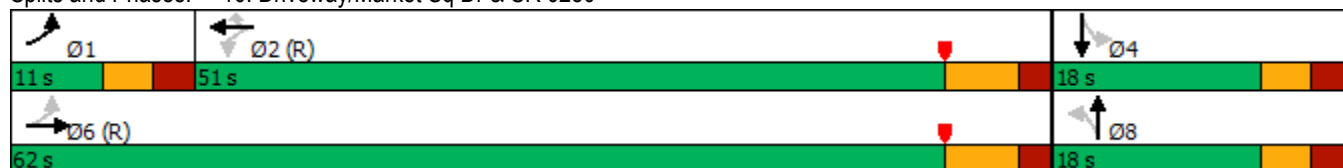
Intersection Capacity Utilization 67.3%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2026 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	446	1	10	764	74	9	2	1	42	3	113
Future Volume (veh/h)	85	446	1	10	764	74	9	2	1	42	3	113
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	89	469	1	11	804	69	9	2	0	44	3	63
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	575	1340	3	707	1338	1142	112	19	0	208	5	113
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.06	0.08	0.00	0.08	0.08	0.06
Sat Flow, veh/h	1629	1678	4	892	1935	1652	401	250	0	1376	70	1474
Grp Volume(v), veh/h	89	0	470	11	804	69	11	0	0	44	0	66
Grp Sat Flow(s),veh/h/ln	1629	0	1682	892	1935	1652	651	0	0	1376	0	1544
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	1.9	0.0	3.3
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.95
Lane Grp Cap(c), veh/h	575	0	1343	707	1338	1142	123	0	0	208	0	118
V/C Ratio(X)	0.15	0.00	0.35	0.02	0.60	0.06	0.09	0.00	0.00	0.21	0.00	0.56
Avail Cap(c_a), veh/h	624	0	1343	707	1338	1142	251	0	0	333	0	259
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(l)	0.58	0.00	0.58	0.75	0.75	0.75	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.8	0.0	0.0	35.0	0.0	36.1
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.5	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.0	0.0	0.4	0.0	0.0	1.5	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.0	0.4	0.0	1.5	0.1	35.1	0.0	0.0	35.5	0.0	40.2
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	559			884			11			110		
Approach Delay, s/veh	0.7			1.4			35.1			38.3		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.6	60.7		10.7		69.3		10.7				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.6	2.5		5.3		2.5		5.3				
Green Ext Time (p_c), s	0.0	1.1		0.2		0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				4.0								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	394	22	41	651	32	92	36	30	34	44	94
Future Volume (vph)	62	394	22	41	651	32	92	36	30	34	44	94
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1708	0	1573	1677	0	1572	1603	0	0	1801	0
Flt Permitted	0.316			0.483			0.518				0.920	
Satd. Flow (perm)	549	1708	0	799	1677	0	856	1603	0	0	1674	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			5			32			82	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	438	0	43	719	0	97	70	0	0	181	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	56.2	56.2		56.2	56.2		13.9	13.9			13.9	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.17	0.17			0.17	
v/c Ratio	0.17	0.36		0.08	0.61		0.66	0.23			0.51	
Control Delay	1.6	1.5		5.4	10.1		50.0	18.0			20.5	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0			0.0	
Total Delay	1.6	1.5		5.4	10.2		50.0	18.0			20.5	
LOS	A	A		A	B		D	B			C	
Approach Delay		1.5			9.9			36.6			20.5	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)	1	7		6	155		46	16			44	
Queue Length 95th (ft)	3	9		20	337		88	46			93	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	385	1201		561	1179		288	562			619	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	36		0	0			1	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.17	0.36		0.08	0.63		0.34	0.12			0.29	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.2

Intersection LOS: B

Intersection Capacity Utilization 82.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)	 Ø4
48 s	32 s
 Ø6 (R)	 Ø8
48 s	32 s

HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2026 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	394	22	41	651	32	92	36	30	34	44	94
Future Volume (veh/h)	62	394	22	41	651	32	92	36	30	34	44	94
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	65	415	22	43	685	32	97	38	14	36	46	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	483	1191	63	795	1333	62	233	161	59	93	82	114
Arrive On Green	1.00	1.00	1.00	0.74	0.74	0.73	0.14	0.14	0.12	0.12	0.14	0.12
Sat Flow, veh/h	676	1607	85	951	1798	84	1183	1189	438	279	609	845
Grp Volume(v), veh/h	65	0	437	43	0	717	97	0	52	160	0	0
Grp Sat Flow(s),veh/h/ln	676	0	1692	951	0	1882	1183	0	1627	1733	0	0
Q Serve(g_s), s	1.9	0.0	0.0	1.0	0.0	12.8	0.3	0.0	2.3	4.4	0.0	0.0
Cycle Q Clear(g_c), s	14.7	0.0	0.0	1.0	0.0	12.8	7.4	0.0	2.3	7.1	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.04	1.00		0.27	0.22		0.49
Lane Grp Cap(c), veh/h	483	0	1254	795	0	1395	233	0	220	268	0	0
V/C Ratio(X)	0.13	0.00	0.35	0.05	0.00	0.51	0.42	0.00	0.24	0.60	0.00	0.00
Avail Cap(c_a), veh/h	483	0	1254	795	0	1395	473	0	549	611	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(l)	0.95	0.00	0.95	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	2.8	0.0	4.3	33.1	0.0	31.0	33.3	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.7	0.1	0.0	1.4	1.2	0.0	0.5	2.1	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(95%),veh/ln	0.2	0.0	0.5	0.2	0.0	6.0	3.3	0.0	1.6	5.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.1	0.0	0.7	2.9	0.0	5.7	34.3	0.0	31.6	35.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	502			760			149			160		
Approach Delay, s/veh	0.9			5.5			33.4			35.4		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	64.2			15.8			64.2			15.8		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			9.1			14.8			9.4		
Green Ext Time (p_c), s	12.8			0.4			18.6			0.4		

Intersection Summary

HCM 6th Ctrl Delay	9.7
HCM 6th LOS	A

Notes

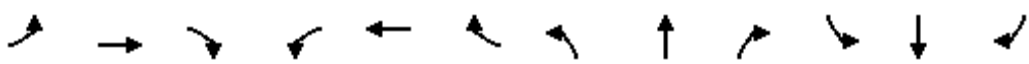
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	570	0	123	276	143	0	0	227	47
Future Volume (vph)	0	0	0	570	0	123	276	143	0	0	227	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.398					
Satd. Flow (perm)	0	0	0	0	1653	1414	666	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	600	129	291	151	0	0	239	49
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					24.9	24.9	28.9	28.9			15.9	15.9
Actuated g/C Ratio					0.39	0.39	0.46	0.46			0.25	0.25
v/c Ratio					0.93	0.20	0.69	0.22			0.57	0.09
Control Delay					42.6	2.9	22.6	11.6			27.1	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					42.6	2.9	22.6	11.6			27.1	0.4
LOS					D	A	C	B			C	A
Approach Delay					35.6			18.8			22.6	
Approach LOS					D			B			C	
Queue Length 50th (ft)					219	0	72	34			81	0
Queue Length 95th (ft)					#412	22	#142	67			146	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					667	660	420	717			446	544
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					0.90	0.20	0.69	0.21			0.54	0.09

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 63.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 27.9

Intersection LOS: C

Intersection Capacity Utilization 122.5%

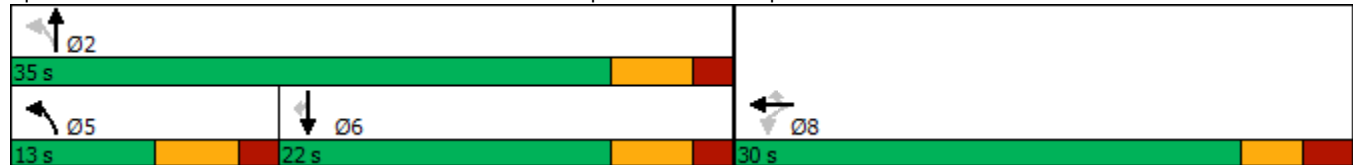
ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶	↷			↷	↶
Traffic Volume (veh/h)	0	0	0	570	0	123	276	143	0	0	227	47
Future Volume (veh/h)	0	0	0	570	0	123	276	143	0	0	227	47
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				600	0	0	291	151	0	0	239	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				692	0		463	709	0	0	401	
Arrive On Green				0.37	0.00	0.00	0.14	0.45	0.00	0.00	0.22	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				600	0	0	291	151	0	0	239	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				18.1	0.0	0.0	7.5	3.4	0.0	0.0	6.9	0.0
Cycle Q Clear(g_c), s				18.1	0.0	0.0	7.5	3.4	0.0	0.0	6.9	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				692	0		463	709	0	0	401	
V/C Ratio(X)				0.87	0.00		0.63	0.21	0.00	0.00	0.60	
Avail Cap(c_a), veh/h				785	0		463	818	0	0	524	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.9	0.0	0.0	13.8	9.8	0.0	0.0	20.1	0.0
Incr Delay (d2), s/veh				9.2	0.0	0.0	2.7	0.5	0.0	0.0	5.1	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
%ile BackOfQ(95%),veh/ln				13.3	0.0	0.0	4.7	1.9	0.0	0.0	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				26.1	0.0	0.0	16.5	10.3	0.0	0.0	25.2	0.0
LnGrp LOS				C	A		B	B	A	A	C	
Approach Vol, veh/h					600			442			239	
Approach Delay, s/veh					26.1			14.4			25.2	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		27.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		24.5				
Max Q Clear Time (g_c+I1), s		5.4			9.5	8.9		20.1				
Green Ext Time (p_c), s		2.9			0.0	2.1		1.4				
Intersection Summary												
HCM 6th Ctrl Delay				21.9								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	3	499	0	0	0	0	380	437	98	706	0
Future Volume (vph)	43	3	499	0	0	0	0	380	437	98	706	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1564	1569	0	0	0	0	1665	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1564	1569	0	0	0	0	1665	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	514	0	0	0	0	843	0	101	728	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 122.5%

ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2026 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh	23.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	43	3	499	0	0	0	0	380	437	98	706	0
Future Vol, veh/h	43	3	499	0	0	0	0	380	437	98	706	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	44	3	514	0	0	0	0	392	451	101	728	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1322	1322	728	-	0	0	392	0	0
Stage 1	930	930	-	-	-	-	-	-	-
Stage 2	392	392	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	163	197	~ 473	0	-	-	885	-	0
Stage 1	456	407	-	0	-	-	-	-	0
Stage 2	774	651	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	144	0	~ 473	-	-	-	885	-	-
Mov Cap-2 Maneuver	144	0	-	-	-	-	-	-	-
Stage 1	456	0	-	-	-	-	-	-	-
Stage 2	686	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	91.9	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	144	473	885	-
HCM Lane V/C Ratio	-	-	0.329	1.088	0.114	-
HCM Control Delay (s)	-	-	41.8	96.5	9.6	-
HCM Lane LOS	-	-	E	F	A	-
HCM 95th %tile Q(veh)	-	-	1.3	16.7	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 No Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	802	1178	10
Future Volume (vph)	3	9	8	802	1178	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1802	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1802	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	835	1224	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	72.6%			ICU Level of Service C		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	802	1178	10
Future Vol, veh/h	3	9	8	802	1178	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	827	1214	10

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2062	1219	1224	0	-	0
Stage 1	1219	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	64	230	508	-	-	-
Stage 1	307	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	62	230	508	-	-	-
Mov Cap-2 Maneuver	62	-	-	-	-	-
Stage 1	298	-	-	-	-	-
Stage 2	472	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.9	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	508	-	137	-	-
HCM Lane V/C Ratio	0.016	-	0.09	-	-
HCM Control Delay (s)	12.2	0	33.9	-	-
HCM Lane LOS	B	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	34	78	9	41	36	59	560	13	49	820	322
Future Volume (vph)	220	34	78	9	41	36	59	560	13	49	820	322
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1685	0	1416	1704	0	1620	1695	0	1628	1672	0
Flt Permitted	0.704			0.681			0.107			0.369		
Satd. Flow (perm)	1200	1685	0	1015	1704	0	182	1695	0	632	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		82			38			4			63	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	232	118	0	9	81	0	62	603	0	52	1202	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	0.97	0.29		0.04	0.22		0.55	0.57		0.13	1.13	
Control Delay	79.7	10.9		20.2	14.2		31.7	13.1		5.6	84.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	79.7	10.9		20.2	14.2		31.7	13.1		5.6	84.3	
LOS	E	B		C	B		C	B		A	F	
Approach Delay		56.5			14.8			14.8			81.1	
Approach LOS		E			B			B			F	
Queue Length 50th (ft)	84	11		3	13		25	247		7	~514	
Queue Length 95th (ft)	#205	47		13	44		m#44	293		19	#738	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	402		203	371		113	1060		395	1068	
Starvation Cap Reductn	0	0		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	0.97	0.29		0.04	0.22		0.55	0.57		0.13	1.13	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 56.2

Intersection LOS: E

Intersection Capacity Utilization 94.5%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2026 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	34	78	9	41	36	59	560	13	49	820	322
Future Volume (veh/h)	220	34	78	9	41	36	59	560	13	49	820	322
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	232	36	58	9	43	24	62	589	13	52	863	328
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	355	142	229	294	219	122	120	1130	25	405	829	315
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1407	712	1147	1111	1097	612	481	1808	40	852	1326	504
Grp Volume(v), veh/h	232	0	94	9	0	67	62	0	602	52	0	1191
Grp Sat Flow(s),veh/h/ln	1407	0	1859	1111	0	1710	481	0	1848	852	0	1830
Q Serve(g_s), s	9.9	0.0	2.6	0.4	0.0	2.0	0.0	0.0	17.4	2.6	0.0	37.5
Cycle Q Clear(g_c), s	11.8	0.0	2.6	3.0	0.0	2.0	37.5	0.0	17.4	20.0	0.0	37.5
Prop In Lane	1.00		0.62	1.00		0.36	1.00		0.02	1.00		0.28
Lane Grp Cap(c), veh/h	355	0	372	294	0	342	120	0	1155	405	0	1144
V/C Ratio(X)	0.65	0.00	0.25	0.03	0.00	0.20	0.52	0.00	0.52	0.13	0.00	1.04
Avail Cap(c_a), veh/h	355	0	372	294	0	342	120	0	1155	405	0	1144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.84	0.00	0.84	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	20.5	21.5	0.0	20.1	42.6	0.0	15.8	14.1	0.0	11.4
Incr Delay (d2), s/veh	4.2	0.0	0.4	0.0	0.0	0.3	12.7	0.0	1.4	0.7	0.0	38.0
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(95%),veh/ln	6.1	0.0	1.9	0.2	0.0	1.3	2.5	0.0	13.0	0.9	0.0	29.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	20.8	21.5	0.0	20.4	55.3	0.0	17.2	14.8	0.0	49.4
LnGrp LOS	C	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	326			76			664			1243		
Approach Delay, s/veh	26.8			20.5			20.8			48.0		
Approach LOS	C			C			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	19.4			13.8			39.5			5.0		
Green Ext Time (p_c), s	10.9			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	36.3											
HCM 6th LOS	D											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	17	61	0	39	16	579	5	10	861	34
Future Volume (vph)	15	0	17	61	0	39	16	579	5	10	861	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1670	0	0	1640	0	0	1722	1648
Flt Permitted		0.769			0.804			0.972			0.993	
Satd. Flow (perm)	0	1338	1581	0	1384	0	0	1596	0	0	1711	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	18	0	105	0	0	631	0	0	917	36
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.6	8.6		8.6			45.1			45.1	45.1
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.08	0.07		0.43			0.53			0.71	0.03
Control Delay		22.1	1.4		18.4			8.2			3.6	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		22.1	1.4		18.4			8.2			3.6	0.1
LOS		C	A		B			A			A	A
Approach Delay		11.1			18.4			8.2			3.4	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		16			225			21	0
Queue Length 95th (ft)		19	3		54			198			m28	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		234	322		287			1199			1285	1249
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		0.07	0.06		0.37			0.53			0.71	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 6.2

Intersection LOS: A

Intersection Capacity Utilization 73.2%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	17	61	0	39	16	579	5	10	861	34
Future Volume (veh/h)	15	0	17	61	0	39	16	579	5	10	861	34
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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	10	64	0	26	17	609	5	11	906	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	288	0	164	199	3	40	73	1212	10	65	1353	1220
Arrive On Green	0.09	0.00	0.10	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1623	0	1586	932	29	391	16	1642	13	6	1832	1652
Grp Volume(v), veh/h	16	0	10	90	0	0	631	0	0	917	0	35
Grp Sat Flow(s),veh/h/ln	1623	0	1586	1352	0	0	1671	0	0	1838	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.3	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.71		0.29	0.03		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	260	0	164	220	0	0	1268	0	0	1388	0	1220
V/C Ratio(X)	0.06	0.00	0.06	0.41	0.00	0.00	0.50	0.00	0.00	0.66	0.00	0.03
Avail Cap(c_a), veh/h	356	0	278	324	0	0	1268	0	0	1388	0	1220
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	24.8	0.0	24.3	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.2	0.0	0.0	1.4	0.0	0.0	0.2	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(95%),veh/ln	0.4	0.0	0.2	2.4	0.0	0.0	0.9	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	24.4	27.8	0.0	0.0	1.4	0.0	0.0	0.2	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	26			90			631			952		
Approach Delay, s/veh	24.7			27.8			1.4			0.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.3			10.7			49.3			10.7		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.5			2.0			6.0		
Green Ext Time (p_c), s	19.8			0.0			29.3			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	286	59	23	302	134	94	282	17	219	352	291
Future Volume (vph)	218	286	59	23	302	134	94	282	17	219	352	291
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1810	0	1604	1640	1442
Flt Permitted	0.223			0.580			0.436			0.379		
Satd. Flow (perm)	373	1791	1435	923	1697	1577	699	1810	0	640	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		2				300
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	295	61	24	311	138	97	309	0	226	363	300
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	48.6	48.6	48.6	26.4	26.4	26.4	49.1	40.5		58.7	45.2	45.2
Actuated g/C Ratio	0.40	0.40	0.40	0.22	0.22	0.22	0.41	0.34		0.49	0.38	0.38
v/c Ratio	0.71	0.41	0.10	0.12	0.83	0.29	0.28	0.51		0.54	0.59	0.41
Control Delay	36.0	26.1	1.1	35.7	63.0	5.0	21.2	37.5		19.0	29.4	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	36.0	26.1	1.1	35.7	63.0	5.0	21.2	37.5		19.0	29.4	6.8
LOS	D	C	A	D	E	A	C	D		B	C	A
Approach Delay		27.3			44.7			33.6			19.1	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	117	158	0	15	231	0	40	193		98	172	37
Queue Length 95th (ft)	158	203	7	36	308	35	83	316		m157	353	78
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	328	932	795	303	558	625	349	611		427	618	730
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.69	0.32	0.08	0.08	0.56	0.22	0.28	0.51		0.53	0.59	0.41

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 28.8

Intersection LOS: C

Intersection Capacity Utilization 78.3%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4 (R)
23 s	45 s	20 s	32 s
 Ø6	 Ø7	 Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	286	59	23	302	134	94	282	17	219	352	291
Future Volume (veh/h)	218	286	59	23	302	134	94	282	17	219	352	291
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	225	295	31	24	311	0	97	291	17	226	363	229
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	313	682	583	255	354		418	742	43	499	697	591
Arrive On Green	0.13	0.37	0.37	0.20	0.20	0.00	0.06	0.37	0.36	0.15	0.56	0.56
Sat Flow, veh/h	1736	1823	1557	972	1766	1544	1880	2017	118	1616	1655	1402
Grp Volume(v), veh/h	225	295	31	24	311	0	97	0	308	226	363	229
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	972	1766	1544	1880	0	2135	1616	1655	1402
Q Serve(g_s), s	11.6	14.5	1.5	2.4	20.5	0.0	3.7	0.0	12.8	9.9	16.3	11.0
Cycle Q Clear(g_c), s	11.6	14.5	1.5	2.4	20.5	0.0	3.7	0.0	12.8	9.9	16.3	11.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	313	682	583	255	354		418	0	786	499	697	591
V/C Ratio(X)	0.72	0.43	0.05	0.09	0.88		0.23	0.00	0.39	0.45	0.52	0.39
Avail Cap(c_a), veh/h	344	950	811	380	581		449	0	786	507	697	591
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	28.0	24.0	39.3	46.5	0.0	21.3	0.0	28.0	17.8	18.9	17.7
Incr Delay (d2), s/veh	6.4	0.2	0.0	0.1	4.8	0.0	0.3	0.0	1.5	0.6	2.8	1.9
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(95%),veh/ln	9.0	10.2	1.0	1.0	14.2	0.0	3.1	0.0	11.3	6.1	9.8	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	28.2	24.0	39.4	51.4	0.0	21.5	0.0	29.5	18.5	21.6	19.6
LnGrp LOS	D	C	C	D	D		C	A	C	B	C	B
Approach Vol, veh/h	551				335			405			818	
Approach Delay, s/veh	32.1				50.5			27.6			20.2	
Approach LOS	C				D			C			C	
Timer - Assigned Phs	1	2	3	4	6			7	8			
Phs Duration (G+Y+Rc), s	20.8	29.6	19.4	50.2	50.4			13.0	56.6			
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5			7.0	7.0			
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0	61.5			8.0	30.0			
Max Q Clear Time (g_c+I1), s	14.1	23.0	12.4	14.8	17.0			6.2	18.8			
Green Ext Time (p_c), s	0.2	0.1	0.1	1.0	0.1			0.0	2.5			

Intersection Summary

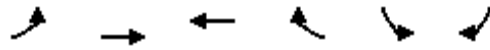
HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2026 No Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	480	413	56	38	1
Future Volume (vph)	6	480	413	56	38	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1763	0	1668	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1763	0	1668	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	500	488	0	41	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.3% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	480	413	56	38	1
Future Vol, veh/h	6	480	413	56	38	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	500	430	58	40	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	488	0	0	971	459
Stage 1	-	-	-	459	-
Stage 2	-	-	-	512	-
Critical Hdwy	4.1	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	3	3.1
Pot Cap-1 Maneuver	838	-	-	280	622
Stage 1	-	-	-	689	-
Stage 2	-	-	-	646	-
Platoon blocked, %	-	-	-		
Mov Cap-1 Maneuver	838	-	-	278	622
Mov Cap-2 Maneuver	-	-	-	430	-
Stage 1	-	-	-	684	-
Stage 2	-	-	-	646	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	838	-	-	-	433
HCM Lane V/C Ratio	0.007	-	-	-	0.094
HCM Control Delay (s)	9.3	-	-	-	14.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2026 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	82	77	4	51	55	33	261	6	85	313	47
Future Volume (vph)	78	82	77	4	51	55	33	261	6	85	313	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1396	0	0	1575	0	0	1668	0	0	1573	0
Flt Permitted		0.984			0.998			0.995			0.991	
Satd. Flow (perm)	0	1396	0	0	1575	0	0	1668	0	0	1573	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	246	0	0	114	0	0	312	0	0	464	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	65.8%											
Analysis Period (min)	15											
ICU Level of Service C												

Intersection	
Intersection Delay, s/veh	23.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	78	82	77	4	51	55	33	261	6	85	313	47
Future Vol, veh/h	78	82	77	4	51	55	33	261	6	85	313	47
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	81	85	80	4	53	57	34	272	6	89	326	49
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17.8	11.9	17.8	33.5
HCM LOS	C	B	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	33%	4%	19%
Vol Thru, %	87%	35%	46%	70%
Vol Right, %	2%	32%	50%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	300	237	110	445
LT Vol	33	78	4	85
Through Vol	261	82	51	313
RT Vol	6	77	55	47
Lane Flow Rate	312	247	115	464
Geometry Grp	1	1	1	1
Degree of Util (X)	0.566	0.506	0.219	0.829
Departure Headway (Hd)	6.52	7.373	6.892	6.436
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	553	489	519	561
Service Time	4.574	5.43	4.965	4.484
HCM Lane V/C Ratio	0.564	0.505	0.222	0.827
HCM Control Delay	17.8	17.8	11.9	33.5
HCM Lane LOS	C	C	B	D
HCM 95th-tile Q	3.5	2.8	0.8	8.5

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 No Build
SAT Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	618	83	131	525	89	126
Future Volume (vph)	618	83	131	525	89	126
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1835	0	1761	1958	1577	0
Flt Permitted			0.221		0.980	
Satd. Flow (perm)	1835	0	410	1958	1577	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	8					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	708	0	132	530	217	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	62.7		76.5	75.3	24.3	
Actuated g/C Ratio	0.57		0.70	0.68	0.22	
v/c Ratio	0.67		0.34	0.40	0.62	
Control Delay	21.8		7.2	8.4	46.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	21.8		7.2	8.4	46.1	
LOS	C		A	A	D	
Approach Delay	21.8			8.2	46.1	
Approach LOS	C			A	D	
Queue Length 50th (ft)	330		32	164	139	
Queue Length 95th (ft)	547		m47	m239	202	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1049		395	1340	570	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.67		0.33	0.40	0.38	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 19.4

Intersection LOS: B

Intersection Capacity Utilization 72.7%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230

↙ Ø1	→ Ø2 (R)	↖ Ø4
13 s	52 s	45 s
↖ Ø6 (R)		
65 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2026 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	618	83	131	525	89	126
Future Volume (veh/h)	618	83	131	525	89	126
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	624	82	132	530	90	127
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	982	129	487	1531	119	167
Arrive On Green	0.64	0.63	0.05	0.73	0.17	0.16
Sat Flow, veh/h	1528	201	1927	2090	688	970
Grp Volume(v), veh/h	0	706	132	530	218	0
Grp Sat Flow(s),veh/h/ln	0	1728	1927	2090	1665	0
Q Serve(g_s), s	0.0	27.2	2.3	10.0	13.7	0.0
Cycle Q Clear(g_c), s	0.0	27.2	2.3	10.0	13.7	0.0
Prop In Lane		0.12	1.00		0.41	0.58
Lane Grp Cap(c), veh/h	0	1111	487	1531	287	0
V/C Ratio(X)	0.00	0.64	0.27	0.35	0.76	0.00
Avail Cap(c_a), veh/h	0	1111	541	1531	603	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	11.9	9.4	5.3	43.6	0.0
Incr Delay (d2), s/veh	0.0	2.8	0.3	0.6	13.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	15.4	1.5	6.9	10.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	14.7	9.7	5.9	57.3	0.0
LnGrp LOS	A	B	A	A	E	A
Approach Vol, veh/h	706			662	218	
Approach Delay, s/veh	14.7			6.6	57.3	
Approach LOS	B			A	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.9	75.9		24.2		85.8
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	4.3	29.2		15.7		12.0
Green Ext Time (p_c), s	0.1	11.4		2.3		15.9
Intersection Summary						
HCM 6th Ctrl Delay			17.2			
HCM 6th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	803	0	1	821	101	0	0	1	48	0	36
Future Volume (vph)	16	803	0	1	821	101	0	0	1	48	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	836	0	1	960	0	0	1	0	50	38	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 65.3% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	803	0	1	821	101	0	0	1	48	0	36
Future Vol, veh/h	16	803	0	1	821	101	0	0	1	48	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	17	836	0	1	855	105	0	0	1	50	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	960	0	0	836	0	0	1799	1832	836	1781	1780	908
Stage 1	-	-	-	-	-	-	870	870	-	910	910	-
Stage 2	-	-	-	-	-	-	929	962	-	871	870	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	650	-	-	465	-	-	81	95	404	92	112	378
Stage 1	-	-	-	-	-	-	426	409	-	426	415	-
Stage 2	-	-	-	-	-	-	396	375	-	446	430	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	650	-	-	465	-	-	71	92	404	90	109	378
Mov Cap-2 Maneuver	-	-	-	-	-	-	71	92	-	90	109	-
Stage 1	-	-	-	-	-	-	415	398	-	415	414	-
Stage 2	-	-	-	-	-	-	356	374	-	433	419	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	13.9	56.1
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	404	650	-	-	465	-	-	90	378
HCM Lane V/C Ratio	0.003	0.026	-	-	0.002	-	-	0.556	0.099
HCM Control Delay (s)	13.9	10.7	-	-	12.8	-	-	86.4	15.6
HCM Lane LOS	B	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	2.5	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	566	49	154	660	15	257	3	161	35	4	14
Future Volume (vph)	22	566	49	154	660	15	257	3	161	35	4	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1744	0
Flt Permitted	0.390			0.274			0.745			0.543		
Satd. Flow (perm)	678	1783	1584	453	1697	1573	1329	1574	0	1007	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			169			15
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	596	52	162	695	16	271	172	0	37	19	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	59.1	59.1	59.1	75.5	74.2	74.2	25.1	25.1		25.1	25.1	
Actuated g/C Ratio	0.54	0.54	0.54	0.69	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.06	0.62	0.06	0.39	0.61	0.01	0.89	0.35		0.16	0.05	
Control Delay	14.1	17.5	2.3	7.4	9.1	0.7	72.7	7.7		35.5	17.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.1	17.5	2.3	7.4	9.1	0.7	72.7	7.7		35.5	17.4	
LOS	B	B	A	A	A	A	E	A		D	B	
Approach Delay		16.2			8.6			47.5			29.4	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	6	169	0	27	151	0	184	2		21	2	
Queue Length 95th (ft)	m15	293	m5	42	211	m0	#332	56		50	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	364	957	889	488	1145	1070	315	502		238	425	
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	0.06	0.62	0.06	0.33	0.61	0.01	0.86	0.34		0.16	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 20.1

Intersection LOS: C

Intersection Capacity Utilization 85.4%

ICU Level of Service E

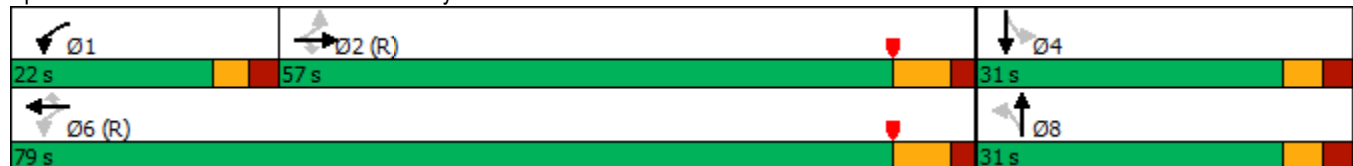
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2026 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	566	49	154	660	15	257	3	161	35	4	14
Future Volume (veh/h)	22	566	49	154	660	15	257	3	161	35	4	14
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	596	30	162	695	11	271	3	104	37	4	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	539	1185	1010	616	1199	1064	380	10	348	292	133	266
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.21	0.21	0.20	0.21	0.21	0.20
Sat Flow, veh/h	817	2047	1743	1666	1736	1540	1489	47	1643	1392	626	1253
Grp Volume(v), veh/h	23	596	30	162	695	11	271	0	107	37	0	12
Grp Sat Flow(s),veh/h/ln	817	2047	1743	1666	1736	1540	1489	0	1691	1392	0	1879
Q Serve(g_s), s	0.0	0.0	0.0	4.0	0.0	0.0	19.3	0.0	5.9	2.5	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.0	0.0	0.0	19.4	0.0	5.9	7.9	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.67
Lane Grp Cap(c), veh/h	539	1185	1010	616	1199	1064	380	0	358	292	0	398
V/C Ratio(X)	0.04	0.50	0.03	0.26	0.58	0.01	0.71	0.00	0.30	0.13	0.00	0.03
Avail Cap(c_a), veh/h	539	1185	1010	763	1199	1064	418	0	401	327	0	446
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(l)	1.00	1.00	1.00	0.81	0.81	0.81	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.1	0.0	0.0	41.8	0.0	36.9	39.6	0.0	34.6
Incr Delay (d2), s/veh	0.1	1.5	0.1	0.2	1.7	0.0	5.1	0.0	0.5	0.2	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(95%),veh/ln	0.0	0.9	0.0	2.0	1.0	0.0	12.2	0.0	4.5	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.1	1.5	0.1	6.3	1.7	0.0	46.9	0.0	37.4	39.8	0.0	34.7
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	649				868				378			
Approach Delay, s/veh	1.4				2.5				44.2			
Approach LOS	A				A				D			
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	12.3	69.5	28.2			81.8		28.2				
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8		* 5.9				
Max Green Setting (Gmax), s	16.5	50.2	* 25			72.2		* 25				
Max Q Clear Time (g_c+I1), s	6.5	2.5	10.4			2.5		21.9				
Green Ext Time (p_c), s	0.3	0.7	0.1			0.8		0.5				

Intersection Summary

HCM 6th Ctrl Delay 11.1
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	513	12	4	642	67	9	3	10	61	39	128
Future Volume (vph)	108	513	12	4	642	67	9	3	10	61	39	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1742	0	1744	1818	1561	0	1765	0	1719	1574	0
Flt Permitted	0.299			0.452				0.591		0.742		
Satd. Flow (perm)	527	1742	0	830	1818	1561	0	1064	0	1342	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		11			137	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	565	0	4	690	72	0	24	0	66	180	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	89.0	88.1		75.4	75.4	75.4		11.9		11.9	11.9	
Actuated g/C Ratio	0.81	0.80		0.69	0.69	0.69		0.11		0.11	0.11	
v/c Ratio	0.23	0.41		0.01	0.55	0.07		0.19		0.46	0.62	
Control Delay	4.0	5.0		6.5	12.8	1.8		32.2		54.9	22.6	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.0	5.0		6.5	13.0	1.8		32.2		54.9	22.6	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		4.8			11.9			32.2			31.3	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	15	84		1	277	2		8		44	28	
Queue Length 95th (ft)	m30	185		m3	449	8		33		85	94	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	525	1395		568	1246	1095		235		285	442	
Starvation Cap Reductn	0	0		0	126	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	0.22	0.41		0.01	0.62	0.07		0.10		0.23	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 12.2

Intersection LOS: B

Intersection Capacity Utilization 65.2%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2026 No Build
SAT Peak Hour

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	108	513	12	4	642	67	9	3	10	61	39	128								
Future Volume (veh/h)	108	513	12	4	642	67	9	3	10	61	39	128								
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		0.99	1.00		0.99								
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837								
Adj Flow Rate, veh/h	116	552	11	4	690	59	10	3	7	66	42	67								
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93								
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0								
Cap, veh/h	616	1349	27	706	1403	1198	67	27	24	190	61	97								
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09								
Sat Flow, veh/h	1629	1658	33	883	1935	1652	185	287	254	1375	635	1013								
Grp Volume(v), veh/h	116	0	563	4	690	59	20	0	0	66	0	109								
Grp Sat Flow(s),veh/h/ln	1629	0	1691	883	1935	1652	726	0	0	1375	0	1648								
Q Serve(g_s), s	1.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.1								
Cycle Q Clear(g_c), s	1.8	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	5.5	0.0	7.1								
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.35	1.00		0.61								
Lane Grp Cap(c), veh/h	616	0	1376	706	1403	1198	112	0	0	190	0	157								
V/C Ratio(X)	0.19	0.00	0.41	0.01	0.49	0.05	0.18	0.00	0.00	0.35	0.00	0.69								
Avail Cap(c_a), veh/h	679	0	1376	706	1403	1198	281	0	0	352	0	351								
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)	0.77	0.00	0.77	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	1.00								
Uniform Delay (d), s/veh	2.4	0.0	0.0	0.0	0.0	0.0	46.0	0.0	0.0	47.5	0.0	48.5								
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.1	0.1	0.8	0.0	0.0	1.1	0.0	5.4								
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(95%),veh/ln	0.6	0.0	0.5	0.0	0.8	0.0	1.0	0.0	0.0	3.2	0.0	5.7								
Unsig. Movement Delay, s/veh																				
LnGrp Delay(d),s/veh	2.5	0.0	0.7	0.0	1.1	0.1	46.8	0.0	0.0	48.6	0.0	53.9								
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D								
Approach Vol, veh/h	679				753				20											
Approach Delay, s/veh	1.0				1.0				46.8											
Approach LOS	A				A				D											
Timer - Assigned Phs	1	2	4		6		8													
Phs Duration (G+Y+Rc), s	9.7	85.2	15.1		94.9		15.1													
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6													
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4													
Max Q Clear Time (g_c+I1), s	4.3	2.5	9.1		2.5		9.1													
Green Ext Time (p_c), s	0.1	0.9	0.5		0.7		0.0													
Intersection Summary																				
HCM 6th Ctrl Delay	7.0																			
HCM 6th LOS	A																			

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	491	24	20	524	13	67	24	17	15	20	75
Future Volume (vph)	54	491	24	20	524	13	67	24	17	15	20	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1744	0	1620	1698	0	1541	1661	0	0	1821	0
Flt Permitted	0.421			0.434			0.537				0.952	
Satd. Flow (perm)	732	1744	0	740	1698	0	871	1661	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			18			79	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	542	0	21	566	0	71	43	0	0	116	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.6	86.6		86.6	86.6		13.5	13.5			13.5	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.10	0.39		0.04	0.42		0.66	0.20			0.41	
Control Delay	5.3	6.5		3.6	5.4		73.4	29.1			20.4	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0			0.0	
Total Delay	5.3	6.6		3.6	5.4		73.4	29.1			20.4	
LOS	A	A		A	A		E	C			C	
Approach Delay		6.5			5.3			56.7			20.4	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	11	152		3	102		49	16			24	
Queue Length 95th (ft)	28	198		10	201		93	47			73	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	575	1373		582	1336		324	630			700	
Starvation Cap Reductn	0	199		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	8		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.10	0.46		0.04	0.43		0.22	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.2

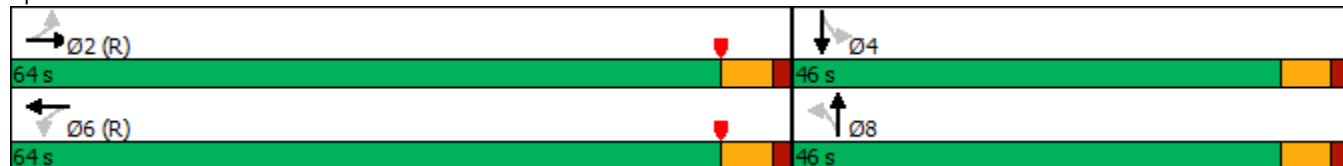
Intersection LOS: B

Intersection Capacity Utilization 68.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2026 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	491	24	20	524	13	67	24	17	15	20	75
Future Volume (veh/h)	54	491	24	20	524	13	67	24	17	15	20	75
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	57	517	20	21	552	13	71	25	6	16	21	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	660	1384	54	805	1551	37	172	104	25	62	51	63
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	779	1660	64	887	1860	44	1244	1364	327	279	675	825
Grp Volume(v), veh/h	57	0	537	21	0	565	71	0	31	69	0	0
Grp Sat Flow(s),veh/h/ln	779	0	1724	887	0	1904	1244	0	1691	1779	0	0
Q Serve(g_s), s	0.7	0.0	0.0	0.4	0.0	7.7	1.0	0.0	1.9	1.8	0.0	0.0
Cycle Q Clear(g_c), s	8.5	0.0	0.0	0.4	0.0	7.7	5.1	0.0	1.9	4.1	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	1.00		0.19	0.23		0.46
Lane Grp Cap(c), veh/h	660	0	1438	805	0	1587	172	0	129	160	0	0
V/C Ratio(X)	0.09	0.00	0.37	0.03	0.00	0.36	0.41	0.00	0.24	0.43	0.00	0.00
Avail Cap(c_a), veh/h	660	0	1438	805	0	1587	540	0	630	675	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(l)	0.92	0.00	0.92	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	1.6	0.0	2.2	49.2	0.0	47.9	49.1	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.1	0.0	0.6	1.6	0.0	1.0	1.8	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	3.0	3.5	0.0	1.5	3.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.0	0.7	1.6	0.0	2.8	50.8	0.0	48.9	51.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	594				586				102			
Approach Delay, s/veh	0.7				2.7				50.2			
Approach LOS	A				A				D			
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.6			13.4			96.6			13.4		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.1			9.7			7.1		
Green Ext Time (p_c), s	19.5			0.2			20.5			0.3		

Intersection Summary

HCM 6th Ctrl Delay 7.9
HCM 6th LOS A

Notes

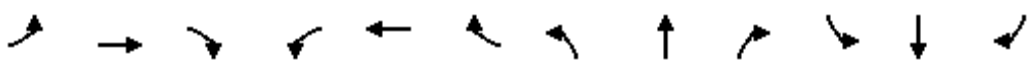
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	340	1	59	207	114	0	0	128	28
Future Volume (vph)	0	0	0	340	1	59	207	114	0	0	128	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1642	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.953		0.497					
Satd. Flow (perm)	0	0	0	0	1642	1442	823	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	355	61	216	119	0	0	133	29
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.6	16.6	27.3	27.3			14.2	14.2
Actuated g/C Ratio					0.31	0.31	0.51	0.51			0.27	0.27
v/c Ratio					0.70	0.11	0.41	0.14			0.29	0.05
Control Delay					24.4	0.4	10.9	8.4			18.7	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					24.4	0.4	10.9	8.4			18.7	0.2
LOS					C	A	B	A			B	A
Approach Delay					20.9			10.0			15.3	
Approach LOS					C			A			B	
Queue Length 50th (ft)					93	0	36	19			34	0
Queue Length 95th (ft)					185	0	79	45			76	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					635	658	533	928			558	611
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					0.56	0.09	0.41	0.13			0.24	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 53.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 15.9

Intersection LOS: B

Intersection Capacity Utilization 54.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	340	1	59	207	114	0	0	128	28
Future Volume (veh/h)	0	0	0	340	1	59	207	114	0	0	128	28
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				354	1	0	216	119	0	0	133	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				478	1		658	911	0	0	504	
Arrive On Green				0.25	0.27	0.00	0.16	0.53	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1780	5	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				355	0	0	216	119	0	0	133	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				8.8	0.0	0.0	3.9	1.7	0.0	0.0	2.7	0.0
Cycle Q Clear(g_c), s				8.8	0.0	0.0	3.9	1.7	0.0	0.0	2.7	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				479	0		658	911	0	0	504	
V/C Ratio(X)				0.74	0.00		0.33	0.13	0.00	0.00	0.26	
Avail Cap(c_a), veh/h				763	0		672	1068	0	0	659	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.5	0.0	0.0	8.0	5.6	0.0	0.0	13.7	0.0
Incr Delay (d2), s/veh				2.3	0.0	0.0	0.3	0.2	0.0	0.0	1.0	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
%ile BackOfQ(95%),veh/ln				6.4	0.0	0.0	1.7	0.8	0.0	0.0	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.8	0.0	0.0	8.3	5.8	0.0	0.0	14.7	0.0
LnGrp LOS				B	A		A	A	A	A	B	
Approach Vol, veh/h					355			335			133	
Approach Delay, s/veh					18.8			7.4			14.7	
Approach LOS					B			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		30.6			12.6	18.0		17.4				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		3.7			5.9	4.7		10.8				
Green Ext Time (p_c), s		2.3			0.1	1.5		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.5								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	210	0	0	0	0	289	348	87	383	0
Future Volume (vph)	24	0	210	0	0	0	0	289	348	87	383	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	226	0	0	0	0	685	0	94	412	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.7% ICU Level of Service A

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2026 No Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	24	0	210	0	0	0	0	289	348	87	383	0
Future Vol, veh/h	24	0	210	0	0	0	0	289	348	87	383	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	26	0	226	0	0	0	0	311	374	94	412	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	911	911	412	-	0	0	311	0	0
Stage 1	600	600	-	-	-	-	-	-	-
Stage 2	311	311	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	315	322	701	0	-	-	973	-	0
Stage 1	654	545	-	0	-	-	-	-	0
Stage 2	865	697	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	284	0	701	-	-	-	973	-	-
Mov Cap-2 Maneuver	284	0	-	-	-	-	-	-	-
Stage 1	654	0	-	-	-	-	-	-	-
Stage 2	781	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	284	701	973	-
HCM Lane V/C Ratio	-	-	0.091	0.322	0.096	-
HCM Control Delay (s)	-	-	18.9	12.6	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	1.4	0.3	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 No Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	13	610	608	3
Future Volume (vph)	6	11	13	610	608	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1796	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1796	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	663	650	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	52.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 No Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	13	610	608	3
Future Vol, veh/h	6	11	13	610	608	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	14	649	647	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1326	649	650	0	-	0
Stage 1	649	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	170	496	769	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	525	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	165	496	769	-	-	-
Mov Cap-2 Maneuver	165	-	-	-	-	-
Stage 1	527	-	-	-	-	-
Stage 2	525	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.2	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	769	-	290	-	-
HCM Lane V/C Ratio	0.018	-	0.062	-	-
HCM Control Delay (s)	9.8	0	18.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	24	53	11	22	33	30	451	8	19	429	181
Future Volume (vph)	153	24	53	11	22	33	30	451	8	19	429	181
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1685	0	1572	1636	0	1620	1712	0	1550	1683	0
Flt Permitted	0.719			0.704			0.348			0.456		
Satd. Flow (perm)	1226	1685	0	1165	1636	0	593	1712	0	744	1683	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56			35			2			60	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	81	0	12	58	0	32	483	0	20	643	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.8	12.8		12.4	12.4		40.5	40.5		40.5	40.5	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.68	0.68		0.68	0.68	
v/c Ratio	0.62	0.20		0.05	0.16		0.08	0.42		0.04	0.56	
Control Delay	31.8	9.8		17.9	11.1		5.5	8.0		5.8	9.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.8	9.8		17.9	11.1		5.5	8.0		5.8	9.1	
LOS	C	A		B	B		A	A		A	A	
Approach Delay		24.4			12.3			7.8			9.0	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)	52	7		3	7		4	87		3	117	
Queue Length 95th (ft)	104	35		14	30		m16	200		10	222	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	463		291	435		399	1155		501	1155	
Starvation Cap Reductn	0	0		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	0.53	0.17		0.04	0.13		0.08	0.42		0.04	0.56	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 11.3

Intersection LOS: B

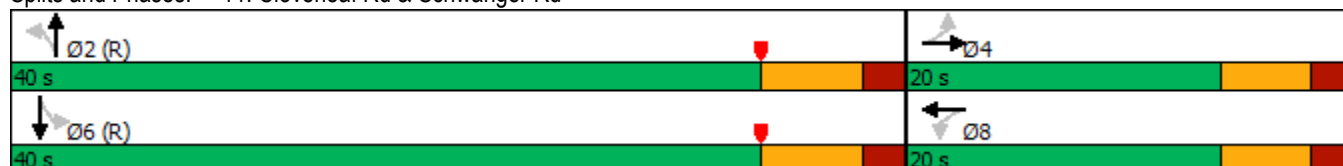
Intersection Capacity Utilization 59.8%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2026 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	24	53	11	22	33	30	451	8	19	429	181
Future Volume (veh/h)	153	24	53	11	22	33	30	451	8	19	429	181
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	161	25	29	12	23	21	32	475	7	20	452	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	348	158	183	318	158	145	508	1183	17	506	884	307
Arrive On Green	0.18	0.18	0.16	0.18	0.18	0.16	0.21	0.21	0.21	0.64	0.64	0.63
Sat Flow, veh/h	1436	872	1012	1263	876	800	830	1837	27	917	1372	477
Grp Volume(v), veh/h	161	0	54	12	0	44	32	0	482	20	0	609
Grp Sat Flow(s),veh/h/ln	1436	0	1884	1263	0	1676	830	0	1864	917	0	1849
Q Serve(g_s), s	6.4	0.0	1.5	0.5	0.0	1.3	2.0	0.0	13.4	0.8	0.0	10.6
Cycle Q Clear(g_c), s	7.7	0.0	1.5	1.9	0.0	1.3	12.6	0.0	13.4	14.1	0.0	10.6
Prop In Lane	1.00		0.54	1.00		0.48	1.00		0.01	1.00		0.26
Lane Grp Cap(c), veh/h	348	0	341	318	0	303	508	0	1201	506	0	1191
V/C Ratio(X)	0.46	0.00	0.16	0.04	0.00	0.15	0.06	0.00	0.40	0.04	0.00	0.51
Avail Cap(c_a), veh/h	447	0	471	405	0	419	508	0	1201	506	0	1191
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.94	0.00	0.94	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	21.0	21.5	0.0	20.9	17.9	0.0	13.7	10.3	0.0	5.8
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0	0.9	0.1	0.0	1.6
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(95%),veh/ln	3.7	0.0	1.1	0.2	0.0	0.9	0.8	0.0	10.8	0.3	0.0	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	21.2	21.6	0.0	21.1	18.1	0.0	14.6	10.4	0.0	7.3
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	A
Approach Vol, veh/h	215			56			514			629		
Approach Delay, s/veh	23.9			21.2			14.8			7.4		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.1			15.9			44.1			15.9		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	15.4			9.7			12.6			3.9		
Green Ext Time (p_c), s	9.4			0.3			13.2			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	13.2											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	24	0	7	15	479	7	11	499	7
Future Volume (vph)	5	1	12	24	0	7	15	479	7	11	499	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1696	0	0	1668	0	0	1722	1648
Flt Permitted					0.990			0.983			0.988	
Satd. Flow (perm)	0	1740	1581	0	1746	0	0	1643	0	0	1703	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	32	0	0	527	0	0	537	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.13			0.36			0.36	0.00
Control Delay		23.5	0.4		5.2			2.9			1.5	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.4		5.2			2.9			1.5	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.7			5.2			2.9			1.5	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		13			106			13	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		379			1456			1509	1466
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		0.02	0.04		0.08			0.36			0.36	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 2.3

Intersection LOS: A

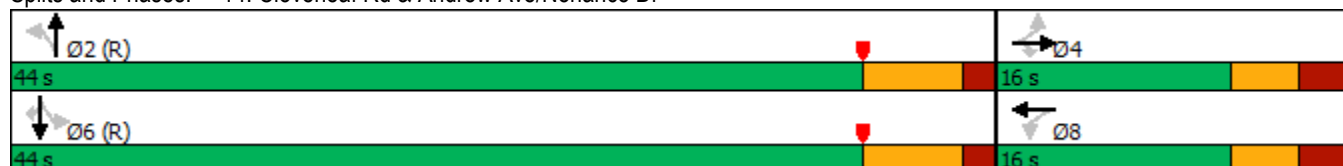
Intersection Capacity Utilization 56.3%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	24	0	7	15	479	7	11	499	7
Future Volume (veh/h)	5	1	12	24	0	7	15	479	7	11	499	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	25	0	3	16	504	7	12	525	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	172	12	70	163	0	6	76	1332	18	71	1453	1318
Arrive On Green	0.03	0.04	0.04	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1397	279	1586	1119	0	134	18	1670	23	11	1822	1652
Grp Volume(v), veh/h	6	0	6	28	0	0	527	0	0	537	0	7
Grp Sat Flow(s),veh/h/ln	1676	0	1586	1253	0	0	1711	0	0	1833	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	1.4	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.89		0.11	0.03		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	156	0	70	148	0	0	1398	0	0	1493	0	1318
V/C Ratio(X)	0.04	0.00	0.09	0.19	0.00	0.00	0.38	0.00	0.00	0.36	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1398	0	0	1493	0	1318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.82	0.00	0.82
Uniform Delay (d), s/veh	27.9	0.0	27.5	28.7	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.5	0.6	0.0	0.0	0.8	0.0	0.0	0.6	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(95%),veh/ln	0.2	0.0	0.2	0.8	0.0	0.0	1.0	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	28.0	29.3	0.0	0.0	2.6	0.0	0.0	0.6	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	12		28			527			544			
Approach Delay, s/veh	28.0		29.3			2.6			0.5			
Approach LOS	C		C			A			A			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	52.9		7.1		52.9		7.1					
Change Period (Y+Rc), s	6.0		5.5		6.0		5.5					
Max Green Setting (Gmax), s	38.0		10.5		38.0		10.5					
Max Q Clear Time (g_c+I1), s	7.4		2.2		2.0		3.4					
Green Ext Time (p_c), s	14.3		0.0		16.0		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	291	55	27	312	136	71	165	14	127	174	181
Future Volume (vph)	204	291	55	27	312	136	71	165	14	127	174	181
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1844	0	1558	1624	1499
Flt Permitted	0.280			0.579			0.645			0.584		
Satd. Flow (perm)	463	1809	1435	931	1731	1592	1178	1844	0	958	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		5				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	297	56	28	318	139	72	182	0	130	178	185
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	30.3	30.3	30.3	16.4	16.4	16.4	18.9	13.1		20.3	16.0	16.0
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.29	0.20		0.31	0.24	0.24
v/c Ratio	0.59	0.36	0.07	0.12	0.74	0.24	0.18	0.49		0.35	0.45	0.34
Control Delay	22.0	15.0	0.2	23.2	36.8	0.9	14.7	28.9		17.1	27.6	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	22.0	15.0	0.2	23.2	36.8	0.9	14.7	28.9		17.1	27.6	3.2
LOS	C	B	A	C	D	A	B	C		B	C	A
Approach Delay		16.1			25.8			24.9			15.7	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	56	82	0	9	127	0	19	68		36	70	0
Queue Length 95th (ft)	#120	151	0	30	#252	0	43	127		72	130	22
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	352	910	802	271	504	644	412	511		371	483	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.59	0.33	0.07	0.10	0.63	0.22	0.17	0.36		0.35	0.37	0.30

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 65.7

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 19.9

Intersection LOS: B

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	291	55	27	312	136	71	165	14	127	174	181
Future Volume (veh/h)	204	291	55	27	312	136	71	165	14	127	174	181
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	208	297	50	28	318	0	72	168	11	130	178	103
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	416	835	707	339	407		367	277	18	372	302	267
Arrive On Green	0.13	0.45	0.45	0.23	0.23	0.00	0.07	0.14	0.12	0.11	0.18	0.18
Sat Flow, veh/h	1723	1837	1557	961	1794	1557	2069	2029	133	1576	1641	1450
Grp Volume(v), veh/h	208	297	50	28	318	0	72	0	179	130	178	103
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	961	1794	1557	2069	0	2162	1576	1641	1450
Q Serve(g_s), s	4.9	6.2	1.1	1.4	9.9	0.0	1.7	0.0	4.6	4.0	5.9	3.7
Cycle Q Clear(g_c), s	4.9	6.2	1.1	1.4	9.9	0.0	1.7	0.0	4.6	4.0	5.9	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	416	835	707	339	407		367	0	295	372	302	267
V/C Ratio(X)	0.50	0.36	0.07	0.08	0.78		0.20	0.00	0.61	0.35	0.59	0.39
Avail Cap(c_a), veh/h	416	992	840	421	560		509	0	638	406	484	428
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	10.5	9.1	18.3	21.5	0.0	19.6	0.0	24.1	18.3	22.1	21.3
Incr Delay (d2), s/veh	0.9	0.1	0.0	0.0	3.2	0.0	0.3	0.0	2.0	0.6	1.8	0.9
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(95%),veh/ln	2.8	3.5	0.5	0.5	7.0	0.0	1.4	0.0	4.4	2.4	3.9	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	10.6	9.1	18.3	24.7	0.0	19.8	0.0	26.1	18.9	24.0	22.2
LnGrp LOS	B	B	A	B	C		B	A	C	B	C	C
Approach Vol, veh/h	555			346			251			411		
Approach Delay, s/veh	12.0			24.2			24.3			21.9		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	18.9	12.8	14.1		32.4	9.9	16.9				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	7.4	12.4	6.5	6.6		8.7	4.2	8.4				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.5		0.1	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Notes

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

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2026 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	49	33	15	33	47	19	176	7	25	179	34
Future Volume (vph)	38	49	33	15	33	47	19	176	7	25	179	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1679	0	0	1633	0	0	1770	0	0	1850	0
Flt Permitted		0.984			0.992			0.995			0.995	
Satd. Flow (perm)	0	1679	0	0	1633	0	0	1770	0	0	1850	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	0	0	99	0	0	210	0	0	247	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.4%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

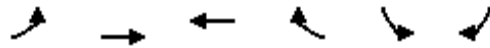
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	38	49	33	15	33	47	19	176	7	25	179	34
Future Vol, veh/h	38	49	33	15	33	47	19	176	7	25	179	34
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	40	51	34	16	34	49	20	183	7	26	186	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	8.7	9.8	9.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	32%	16%	11%
Vol Thru, %	87%	41%	35%	75%
Vol Right, %	3%	28%	49%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	202	120	95	238
LT Vol	19	38	15	25
Through Vol	176	49	33	179
RT Vol	7	33	47	34
Lane Flow Rate	210	125	99	248
Geometry Grp	1	1	1	1
Degree of Util (X)	0.283	0.178	0.134	0.32
Departure Headway (Hd)	4.836	5.138	4.885	4.652
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	739	693	727	769
Service Time	2.896	3.213	2.961	2.71
HCM Lane V/C Ratio	0.284	0.18	0.136	0.322
HCM Control Delay	9.8	9.3	8.7	9.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.6	0.5	1.4

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2026 No Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	391	426	34	32	3
Future Volume (vph)	3	391	426	34	32	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1793	0	1660	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1793	0	1660	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	407	479	0	36	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	391	426	34	32	3
Future Vol, veh/h	3	391	426	34	32	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	407	444	35	33	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	479	0	-	0	875	462
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	413	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	843	-	-	-	324	619
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	729	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	843	-	-	-	323	619
Mov Cap-2 Maneuver	-	-	-	-	469	-
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	729	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	843	-	-	-	479	
HCM Lane V/C Ratio	0.004	-	-	-	0.076	
HCM Control Delay (s)	9.3	-	-	-	13.1	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

APPENDIX L9

2026 BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	443	79	88	387	143	150
Future Volume (vph)	443	79	88	387	143	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1685	0	1662	1766	1532	0
Flt Permitted			0.220		0.976	
Satd. Flow (perm)	1685	0	385	1766	1532	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	16					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	580	0	98	430	326	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.6		42.3	41.1	18.5	
Actuated g/C Ratio	0.45		0.60	0.59	0.26	
v/c Ratio	0.76		0.26	0.41	0.81	
Control Delay	25.3		5.6	6.5	41.7	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	25.3		5.6	6.5	41.7	
LOS	C		A	A	D	
Approach Delay	25.3			6.4	41.7	
Approach LOS	C			A	D	
Queue Length 50th (ft)	210		12	58	130	
Queue Length 95th (ft)	#389		23	82	#256	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	768		378	1037	411	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.76		0.26	0.41	0.79	

Intersection Summary

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: Maytown Rd & SR 0230

 Ø1 12 s	 Ø2 (R) 34 s	 Ø4 24 s
 Ø6 (R) 46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2026 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	👉		👈	👈	👉	
Traffic Volume (veh/h)	443	79	88	387	143	150
Future Volume (veh/h)	443	79	88	387	143	150
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	492	82	98	430	159	167
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	655	109	401	1171	192	202
Arrive On Green	0.48	0.46	0.15	1.00	0.24	0.23
Sat Flow, veh/h	1377	229	1846	1927	790	830
Grp Volume(v), veh/h	0	574	98	430	327	0
Grp Sat Flow(s),veh/h/ln	0	1606	1846	1927	1625	0
Q Serve(g_s), s	0.0	20.4	1.6	0.0	13.4	0.0
Cycle Q Clear(g_c), s	0.0	20.4	1.6	0.0	13.4	0.0
Prop In Lane		0.14	1.00		0.49	0.51
Lane Grp Cap(c), veh/h	0	764	401	1171	396	0
V/C Ratio(X)	0.00	0.75	0.24	0.37	0.83	0.00
Avail Cap(c_a), veh/h	0	764	473	1171	436	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	15.0	9.7	0.0	25.3	0.0
Incr Delay (d2), s/veh	0.0	6.7	0.3	0.9	16.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	12.4	0.9	0.5	10.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	21.8	10.0	0.9	41.3	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	574			528	327	
Approach Delay, s/veh	21.8			2.6	41.3	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.3	38.5		22.3		47.7
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.6	22.4		15.4		2.0
Green Ext Time (p_c), s	0.1	3.6		0.7		11.3
Intersection Summary						
HCM 6th Ctrl Delay			19.2			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	622	1	0	569	45	0	0	2	46	0	35
Future Volume (vph)	26	622	1	0	569	45	0	0	2	46	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	700	0	0	690	0	0	2	0	52	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.8%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	622	1	0	569	45	0	0	2	46	0	35
Future Vol, veh/h	26	622	1	0	569	45	0	0	2	46	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	29	699	1	0	639	51	0	0	2	52	0	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	690	0	0	700	0	0	1443	1448	701	1425	1423	666
Stage 1	-	-	-	-	-	-	758	758	-	665	665	-
Stage 2	-	-	-	-	-	-	685	690	-	760	758	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	729	-	-	544	-	-	141	156	392	156	174	456
Stage 1	-	-	-	-	-	-	487	455	-	566	515	-
Stage 2	-	-	-	-	-	-	532	485	-	507	475	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	729	-	-	544	-	-	125	150	392	150	167	456
Mov Cap-2 Maneuver	-	-	-	-	-	-	125	150	-	150	167	-
Stage 1	-	-	-	-	-	-	468	437	-	543	515	-
Stage 2	-	-	-	-	-	-	486	485	-	484	456	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	14.2	29.2
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	392	729	-	-	544	-	-	150	456
HCM Lane V/C Ratio	0.006	0.04	-	-	-	-	-	0.345	0.086
HCM Control Delay (s)	14.2	10.1	-	-	0	-	-	41.1	13.6
HCM Lane LOS	B	B	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1.4	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	538	44	62	504	6	102	2	72	4	3	2
Future Volume (vph)	3	538	44	62	504	6	102	2	72	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.454			0.305			0.754			0.704		
Satd. Flow (perm)	789	1667	1552	495	1558	1608	1302	1516	0	1305	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45		80			2	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	598	49	69	560	7	113	82	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	44.6	44.6	44.6	52.3	52.1	52.1	10.8	10.8		10.6	10.6	
Actuated g/C Ratio	0.64	0.64	0.64	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.56	0.05	0.14	0.48	0.01	0.56	0.27		0.02	0.02	
Control Delay	6.7	8.5	0.1	1.5	3.2	0.0	38.5	9.8		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	8.5	0.1	1.5	3.2	0.0	38.5	9.8		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		7.9			3.0			26.4			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	91	0	6	61	0	45	1		1	1	
Queue Length 95th (ft)	m1	m125	m0	1	12	m0	92	34		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	502	1062	1036	496	1160	1208	225	328		225	320	
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	0.01	0.56	0.05	0.14	0.48	0.01	0.50	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 8.3

Intersection LOS: A

Intersection Capacity Utilization 66.9%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	538	44	62	504	6	102	2	72	4	3	2
Future Volume (veh/h)	3	538	44	62	504	6	102	2	72	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	598	33	69	560	6	113	2	42	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	671	1189	1052	633	1168	1119	280	9	195	257	143	95
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	931	1947	1722	1640	1609	1542	1460	77	1611	1469	1175	784
Grp Volume(v), veh/h	3	598	33	69	560	6	113	0	44	4	0	5
Grp Sat Flow(s),veh/h/ln	931	1947	1722	1640	1609	1542	1460	0	1687	1469	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	5.2	0.0	1.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.9	0.0	0.0	5.2	0.0	1.7	1.3	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.40
Lane Grp Cap(c), veh/h	671	1189	1052	633	1168	1119	280	0	205	257	0	238
V/C Ratio(X)	0.00	0.50	0.03	0.11	0.48	0.01	0.40	0.00	0.21	0.02	0.00	0.02
Avail Cap(c_a), veh/h	671	1189	1052	749	1168	1119	355	0	292	332	0	339
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)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.2	0.0	0.0	29.3	0.0	28.2	28.1	0.0	27.3
Incr Delay (d2), s/veh	0.0	1.5	0.1	0.1	1.3	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.9	0.0	0.3	0.8	0.0	3.3	0.0	1.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.5	0.1	3.3	1.3	0.0	30.2	0.0	28.7	28.2	0.0	27.3
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		634			635			157			9	
Approach Delay, s/veh		1.4			1.5			29.8			27.7	
Approach LOS		A			A			C			C	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.1	48.5		13.4		56.6		13.4				
Change Period (Y+Rc), s	5.5	6.8		* 5.9		6.8		* 5.9				
Max Green Setting (Gmax), s	7.5	33.2		* 11		46.2		* 11				
Max Q Clear Time (g_c+I1), s	3.4	2.5		3.8		2.5		7.7				
Green Ext Time (p_c), s	0.0	0.8		0.0		0.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	4.7
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	464	13	5	539	12	9	0	14	6	0	8
Future Volume (vph)	26	464	13	5	539	12	9	0	14	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1660	0	1744	1654	1445	0	1729	0	1719	1501	0
Flt Permitted	0.368			0.474				0.866				
Satd. Flow (perm)	649	1660	0	870	1654	1415	0	1526	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				126		139			386	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	513	0	5	580	13	0	25	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.34		0.01	0.42	0.01		0.09		0.03	0.02	
Control Delay	0.8	2.5		3.6	5.2	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.8	2.5		3.6	5.2	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.4			5.0			0.7			11.5	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	75		m1	182	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	657	1493		727	1383	1204		325		242	535	
Starvation Cap Reductn	0	0		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	0.04	0.34		0.01	0.42	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 3.8

Intersection LOS: A

Intersection Capacity Utilization 46.4%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2026 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	464	13	5	539	12	9	0	14	6	0	8
Future Volume (veh/h)	26	464	13	5	539	12	9	0	14	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	28	499	14	5	580	13	10	0	14	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	701	1291	36	772	1297	1125	89	0	22	159	68	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1574	44	924	1793	1554	426	0	596	1361	1837	0
Grp Volume(v), veh/h	28	0	513	5	580	13	24	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1618	924	1793	1554	1021	0	0	1361	1837	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.42		0.58	1.00		0.00
Lane Grp Cap(c), veh/h	701	0	1327	772	1297	1125	96	0	0	159	68	0
V/C Ratio(X)	0.04	0.00	0.39	0.01	0.45	0.01	0.25	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	799	0	1327	772	1297	1125	241	0	0	291	247	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(l)	0.81	0.00	0.81	0.91	0.91	0.91	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	0.0	0.0	0.0	0.0	0.0	34.0	0.0	0.0	32.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.0	1.0	0.0	1.3	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.5	0.0	0.7	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.7	0.0	1.0	0.0	35.3	0.0	0.0	32.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	541			598			24			6		
Approach Delay, s/veh	0.7			1.0			35.3			32.7		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.8	56.0	7.2		62.8		7.2					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.8	2.5	2.7		2.5		3.6					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				1.7								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	435	1	10	442	24	59	27	36	28	15	47
Future Volume (vph)	38	435	1	10	442	24	59	27	36	28	15	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1593	0	1248	1497	0	0	1792	0
Flt Permitted	0.454			0.474			0.766				0.871	
Satd. Flow (perm)	805	1685	0	622	1593	0	1006	1497	0	0	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			39			51	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	469	0	11	501	0	63	68	0	0	97	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.4	52.4		52.4	52.4		11.0	11.0			11.0	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.07	0.37		0.02	0.42		0.40	0.25			0.33	
Control Delay	1.0	1.6		4.5	6.2		32.9	15.4			16.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.0	1.6		4.5	6.2		32.9	15.4			16.7	
LOS	A	A		A	A		C	B			B	
Approach Delay		1.6			6.2			23.8			16.7	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	8		1	73		25	11			18	
Queue Length 95th (ft)	3	17		7	164		55	40			52	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	602	1261		465	1194		287	455			488	
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	0.07	0.37		0.02	0.42		0.22	0.15			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 7.0

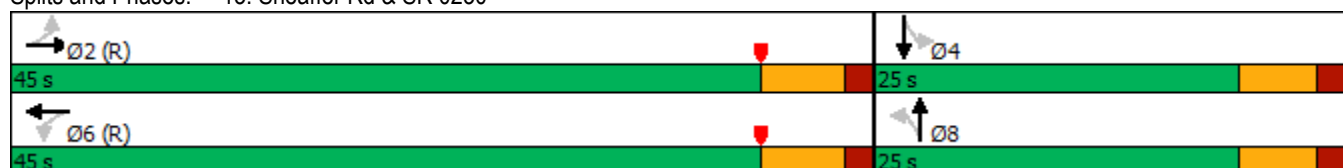
Intersection LOS: A

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

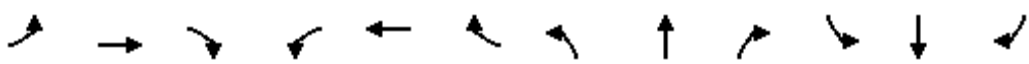
2026 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	435	1	10	442	24	59	27	36	28	15	47
Future Volume (veh/h)	38	435	1	10	442	24	59	27	36	28	15	47
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		0.99	1.00		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	41	468	0	11	475	25	63	29	17	30	16	33
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	666	1278	0	662	1309	69	217	97	57	112	43	61
Arrive On Green	1.00	1.00	0.00	0.76	0.76	0.75	0.10	0.10	0.08	0.08	0.10	0.08
Sat Flow, veh/h	840	1680	0	734	1720	91	1001	999	585	424	443	622
Grp Volume(v), veh/h	41	468	0	11	0	500	63	0	46	79	0	0
Grp Sat Flow(s),veh/h/ln	840	1680	0	734	0	1810	1001	0	1584	1490	0	0
Q Serve(g_s), s	0.4	0.0	0.0	0.3	0.0	6.4	0.0	0.0	1.9	1.9	0.0	0.0
Cycle Q Clear(g_c), s	6.8	0.0	0.0	0.3	0.0	6.4	3.2	0.0	1.9	3.8	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.05	1.00		0.37	0.38		0.42
Lane Grp Cap(c), veh/h	666	1278	0	662	0	1378	217	0	154	195	0	0
V/C Ratio(X)	0.06	0.37	0.00	0.02	0.00	0.36	0.29	0.00	0.30	0.41	0.00	0.00
Avail Cap(c_a), veh/h	666	1278	0	662	0	1378	406	0	453	507	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(l)	0.95	0.95	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	2.0	0.0	2.8	29.9	0.0	29.5	30.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.8	0.0	0.0	0.0	0.7	0.7	0.0	1.1	1.4	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(95%),veh/ln	0.1	0.5	0.0	0.0	0.0	2.2	1.8	0.0	1.3	2.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.8	0.0	2.1	0.0	3.5	30.7	0.0	30.6	32.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	509		511			109			79			
Approach Delay, s/veh	0.8		3.5			30.6			32.0			
Approach LOS	A		A			C			C			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	58.2		11.8			58.2			11.8			
Change Period (Y+Rc), s	* 5.9		6.0			* 5.9			6.0			
Max Green Setting (Gmax), s	* 39		19.0			* 39			19.0			
Max Q Clear Time (g_c+I1), s	2.0		5.8			8.4			5.2			
Green Ext Time (p_c), s	13.9		0.1			14.1			0.3			
Intersection Summary												
HCM 6th Ctrl Delay	6.6											
HCM 6th LOS	A											
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	380	0	88	553	149	0	0	205	56
Future Volume (vph)	0	0	0	380	0	88	553	149	0	0	205	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.449					
Satd. Flow (perm)	0	0	0	0	1546	1145	730	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	396	92	576	155	0	0	214	58
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.5	16.5	32.7	32.7			15.7	15.7
Actuated g/C Ratio					0.28	0.28	0.56	0.56			0.27	0.27
v/c Ratio					0.91	0.21	1.01	0.20			0.52	0.11
Control Delay					50.7	1.9	54.2	7.2			23.6	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					50.7	1.9	54.2	7.2			23.6	0.4
LOS					D	A	D	A			C	A
Approach Delay					41.5			44.3			18.6	
Approach LOS					D			D			B	
Queue Length 50th (ft)					139	0	128	24			64	0
Queue Length 95th (ft)					#290	8	#394	49			121	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2026 Build

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					434	439	573	824			442	551
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					0.91	0.21	1.01	0.19			0.48	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 38.7

Intersection LOS: D

Intersection Capacity Utilization 91.7%

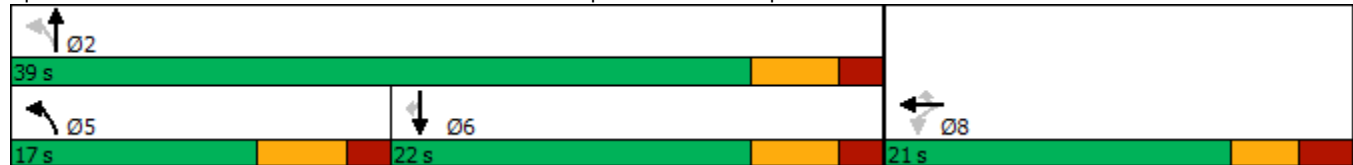
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	380	0	88	553	149	0	0	205	56
Future Volume (veh/h)	0	0	0	380	0	88	553	149	0	0	205	56
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				396	0	0	576	155	0	0	214	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				485	0		624	820	0	0	398	
Arrive On Green				0.25	0.00	0.00	0.22	0.55	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				396	0	0	576	155	0	0	214	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				11.3	0.0	0.0	12.0	2.8	0.0	0.0	6.1	0.0
Cycle Q Clear(g_c), s				11.3	0.0	0.0	12.0	2.8	0.0	0.0	6.1	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				485	0		624	820	0	0	398	
V/C Ratio(X)				0.82	0.00		0.92	0.19	0.00	0.00	0.54	
Avail Cap(c_a), veh/h				543	0		624	929	0	0	521	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.0	0.0	0.0	13.3	6.1	0.0	0.0	18.0	0.0
Incr Delay (d2), s/veh				8.6	0.0	0.0	19.5	0.4	0.0	0.0	4.1	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
%ile BackOfQ(50%),veh/ln				5.5	0.0	0.0	7.2	0.7	0.0	0.0	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.5	0.0	0.0	32.8	6.5	0.0	0.0	22.1	0.0
LnGrp LOS				C	A		C	A	A	A	C	
Approach Vol, veh/h					396			731			214	
Approach Delay, s/veh					27.5			27.2			22.1	
Approach LOS					C			C			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	35.0			17.0			18.0			19.3		
Change Period (Y+Rc), s	6.0			6.0			6.0			5.5		
Max Green Setting (Gmax), s	33.0			11.0			16.0			15.5		
Max Q Clear Time (g_c+I1), s	4.8			14.0			8.1			13.3		
Green Ext Time (p_c), s	3.4			0.0			2.0			0.5		
Intersection Summary												
HCM 6th Ctrl Delay	26.5											
HCM 6th LOS	C											

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2	278	0	0	0	0	670	608	108	470	0
Future Volume (vph)	32	2	278	0	0	0	0	670	608	108	470	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	296	0	0	0	0	1360	0	115	500	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 91.7% ICU Level of Service F

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2026 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	32	2	278	0	0	0	0	670	608	108	470	0
Future Vol, veh/h	32	2	278	0	0	0	0	670	608	108	470	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	34	2	296	0	0	0	0	713	647	115	500	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1443	1443	500	-	0	0	713	0	0
Stage 1	730	730	-	-	-	-	-	-	-
Stage 2	713	713	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	138	170	606	0	-	-	704	-	0
Stage 1	572	486	-	0	-	-	-	-	0
Stage 2	582	494	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	116	0	606	-	-	-	704	-	-
Mov Cap-2 Maneuver	116	0	-	-	-	-	-	-	-
Stage 1	572	0	-	-	-	-	-	-	-
Stage 2	487	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.1	0	2.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	116	606	704	-
HCM Lane V/C Ratio	-	-	0.312	0.488	0.163	-
HCM Control Delay (s)	-	-	49.5	16.5	11.1	-
HCM Lane LOS	-	-	E	C	B	-
HCM 95th %tile Q(veh)	-	-	1.2	2.7	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	25	0	1260	740	5
Future Volume (vph)	6	25	0	1260	740	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1622	0	0	1734	1652	0
Flt Permitted	0.990					
Satd. Flow (perm)	1622	0	0	1734	1652	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	1400	828	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	76.3%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	0	1260	740	5
Future Vol, veh/h	6	25	0	1260	740	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	28	0	1400	822	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2225	825	828	0	-	0
Stage 1	825	-	-	-	-	-
Stage 2	1400	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	51	392	677	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	51	392	677	-	-	-
Mov Cap-2 Maneuver	51	-	-	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	31.3	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	677	-	171	-	-	
HCM Lane V/C Ratio	-	-	0.201	-	-	
HCM Control Delay (s)	0	-	31.3	-	-	
HCM Lane LOS	A	-	D	-	-	
HCM 95th %tile Q(veh)	0	-	0.7	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	340	19	103	8	12	75	42	846	8	10	617	150
Future Volume (vph)	340	19	103	8	12	75	42	846	8	10	617	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1568	0	1391	1563	0	1500	1616	0	1628	1581	0
Flt Permitted	0.695			0.671			0.153			0.101		
Satd. Flow (perm)	1173	1568	0	981	1563	0	242	1616	0	173	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		114			83			1			29	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	378	135	0	9	96	0	47	949	0	11	853	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.13	0.26		0.03	0.19		0.35	1.04		0.11	0.94	
Control Delay	116.5	7.2		18.6	7.4		13.3	54.2		10.5	35.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	116.5	7.2		18.6	7.4		13.3	54.2		10.5	35.3	
LOS	F	A		B	A		B	D		B	D	
Approach Delay		87.7			8.3			52.2			35.0	
Approach LOS		F			A			D			C	
Queue Length 50th (ft)	~193	7		3	4		6	~455		2	302	
Queue Length 95th (ft)	#347	44		13	35		m13	#663		10	#573	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	335	529		280	505		136	912		97	904	
Starvation Cap Reductn	0	0		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	1.13	0.26		0.03	0.19		0.35	1.04		0.11	0.94	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 51.7

Intersection LOS: D

Intersection Capacity Utilization 82.8%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

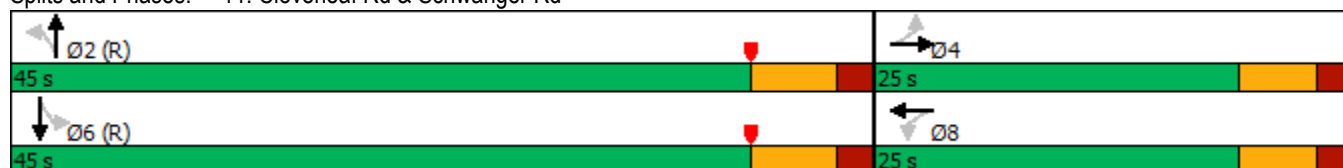
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary 11: Cloverleaf Rd & Schwanger Rd

2026 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	19	103	8	12	75	42	846	8	10	617	150
Future Volume (veh/h)	340	19	103	8	12	75	42	846	8	10	617	150
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	378	21	114	9	13	83	47	940	9	11	686	167
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	422	80	432	341	57	363	194	995	10	450	792	193
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1359	278	1512	1050	199	1272	622	1764	17	616	1404	342
Grp Volume(v), veh/h	378	0	135	9	0	96	47	0	949	11	0	853
Grp Sat Flow(s),veh/h/ln	1359	0	1790	1050	0	1471	622	0	1781	616	0	1745
Q Serve(g_s), s	16.5	0.0	4.1	0.5	0.0	3.5	4.5	0.0	0.0	0.6	0.0	29.2
Cycle Q Clear(g_c), s	20.0	0.0	4.1	4.6	0.0	3.5	33.7	0.0	0.0	0.6	0.0	29.2
Prop In Lane	1.00		0.84	1.00		0.86	1.00		0.01	1.00		0.20
Lane Grp Cap(c), veh/h	422	0	512	341	0	420	194	0	1005	450	0	985
V/C Ratio(X)	0.90	0.00	0.26	0.03	0.00	0.23	0.24	0.00	0.94	0.02	0.00	0.87
Avail Cap(c_a), veh/h	422	0	512	341	0	420	194	0	1005	450	0	985
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.68	0.00	0.68	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	19.7	21.1	0.0	19.5	12.5	0.0	0.0	6.8	0.0	13.1
Incr Delay (d2), s/veh	21.0	0.0	0.3	0.0	0.0	0.3	2.0	0.0	13.5	0.1	0.0	10.1
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	8.6	0.0	1.6	0.1	0.0	1.2	0.6	0.0	3.8	0.1	0.0	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.1	0.0	19.9	21.1	0.0	19.7	14.5	0.0	13.5	6.9	0.0	23.2
LnGrp LOS	D	A	B	C	A	B	B	A	B	A	A	C
Approach Vol, veh/h	513			105			996			864		
Approach Delay, s/veh	41.4			19.8			13.5			23.0		
Approach LOS	D			B			B			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			31.2			6.6		
Green Ext Time (p_c), s	30.2			0.0			6.5			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	22.9											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	16	16	1	35	2	833	7	63	643	7
Future Volume (vph)	35	0	16	16	1	35	2	833	7	63	643	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1630	0	0	1561	0	0	1618	1648
Flt Permitted		0.973			0.881			0.999			0.874	
Satd. Flow (perm)	0	1693	1581	0	1458	0	0	1559	0	0	1420	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		36			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	17	0	54	0	0	877	0	0	736	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.6			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.17	0.07		0.26			0.67			0.62	0.01
Control Delay		28.4	2.4		16.9			8.8			10.7	0.6
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		28.4	2.4		16.9			8.8			10.7	0.6
LOS		C	A		B			A			B	A
Approach Delay		20.1			16.9			8.8			10.6	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		14	0		7			168			240	0
Queue Length 95th (ft)		37	4		35			#407			m281	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		302	320		289			1300			1184	1381
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		0.12	0.05		0.19			0.67			0.62	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 105.4%

ICU Level of Service G

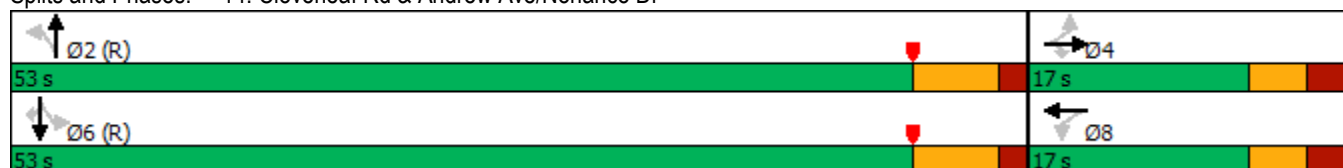
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	16	16	1	35	2	833	7	63	643	7
Future Volume (veh/h)	35	0	16	16	1	35	2	833	7	63	643	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	36	0	17	17	1	36	2	868	7	66	670	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	224	0	121	92	10	69	52	1277	10	129	1165	1302
Arrive On Green	0.06	0.00	0.08	0.06	0.08	0.06	0.77	0.79	0.77	1.00	1.00	1.00
Sat Flow, veh/h	1584	0	1586	325	126	903	1	1621	13	92	1479	1652
Grp Volume(v), veh/h	36	0	17	54	0	0	877	0	0	736	0	7
Grp Sat Flow(s),veh/h/ln	1584	0	1586	1354	0	0	1634	0	0	1571	0	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.7	2.9	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.31		0.67	0.00		0.01	0.09		1.00
Lane Grp Cap(c), veh/h	201	0	121	152	0	0	1316	0	0	1271	0	1302
V/C Ratio(X)	0.18	0.00	0.14	0.36	0.00	0.00	0.67	0.00	0.00	0.58	0.00	0.01
Avail Cap(c_a), veh/h	336	0	283	308	0	0	1316	0	0	1271	0	1302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.24	0.00	0.24
Uniform Delay (d), s/veh	31.0	0.0	30.2	31.7	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.4	0.0	0.0	2.7	0.0	0.0	0.5	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	0.6	0.0	0.3	1.0	0.0	0.0	3.0	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.4	0.0	30.7	33.1	0.0	0.0	6.1	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	53					54		877		743		
Approach Delay, s/veh	31.2					33.1		6.1		0.5		
Approach LOS	C					C		A		A		
Timer - Assigned Phs	2		4			6		8				
Phs Duration (G+Y+Rc), s	60.2		9.8			60.2		9.8				
Change Period (Y+Rc), s	6.0		5.5			6.0		5.5				
Max Green Setting (Gmax), s	47.0		11.5			47.0		11.5				
Max Q Clear Time (g_c+I1), s	19.6		3.4			2.0		4.9				
Green Ext Time (p_c), s	21.8		0.1			27.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	5.3											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	236	38	48	234	201	73	372	46	107	212	187
Future Volume (vph)	277	236	38	48	234	201	73	372	46	107	212	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1687	0	1500	1509	1388
Flt Permitted	0.326			0.603			0.568			0.225		
Satd. Flow (perm)	510	1660	1088	757	1649	1561	979	1687	0	355	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		8				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	295	251	40	51	249	214	78	445	0	114	226	199
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	30.7	30.7	30.7	15.5	15.5	15.5	27.7	21.7		27.9	21.7	21.7
Actuated g/C Ratio	0.41	0.41	0.41	0.21	0.21	0.21	0.37	0.29		0.37	0.29	0.29
v/c Ratio	0.88	0.37	0.07	0.32	0.73	0.42	0.18	0.90		0.45	0.51	0.35
Control Delay	48.8	18.1	0.3	32.7	42.0	5.6	14.1	51.2		19.5	28.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	48.8	18.1	0.3	32.7	42.0	5.6	14.1	51.2		19.5	28.9	4.2
LOS	D	B	A	C	D	A	B	D		B	C	A
Approach Delay		32.4			25.9			45.7			17.8	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	105	84	0	21	114	0	21	207		31	93	0
Queue Length 95th (ft)	#253	142	0	54	#199	41	47	#403		65	168	34

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	334	741	568	184	401	561	435	496		256	440	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.88	0.34	0.07	0.28	0.62	0.38	0.18	0.90		0.45	0.51	0.35

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 74.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 30.4

Intersection LOS: C

Intersection Capacity Utilization 78.2%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	277	236	38	48	234	201	73	372	46	107	212	187
Future Volume (veh/h)	277	236	38	48	234	201	73	372	46	107	212	187
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	295	251	27	51	249	0	78	396	47	114	226	169
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	383	680	480	247	320		413	473	56	293	443	392
Arrive On Green	0.13	0.40	0.40	0.37	0.37	0.00	0.06	0.26	0.25	0.09	0.29	0.29
Sat Flow, veh/h	1641	1709	1206	782	1724	1532	1988	1813	215	1522	1528	1352
Grp Volume(v), veh/h	295	251	27	51	249	0	78	0	443	114	226	169
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	782	1724	1532	1988	0	2028	1522	1528	1352
Q Serve(g_s), s	9.5	7.3	1.0	3.3	9.0	0.0	1.9	0.0	14.6	3.7	8.7	7.2
Cycle Q Clear(g_c), s	9.5	7.3	1.0	3.3	9.0	0.0	1.9	0.0	14.6	3.7	8.7	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	383	680	480	247	320		413	0	529	293	443	392
V/C Ratio(X)	0.77	0.37	0.06	0.21	0.78		0.19	0.00	0.84	0.39	0.51	0.43
Avail Cap(c_a), veh/h	383	800	564	302	440		511	0	618	324	466	412
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	15.0	13.1	19.1	20.9	0.0	17.1	0.0	24.7	17.6	20.9	20.3
Incr Delay (d2), s/veh	9.2	0.1	0.0	0.2	3.8	0.0	0.2	0.0	8.7	0.8	0.9	0.8
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	4.2	2.4	0.2	0.5	3.0	0.0	0.9	0.0	8.0	1.2	2.9	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	15.1	13.1	19.3	24.8	0.0	17.3	0.0	33.4	18.4	21.8	21.1
LnGrp LOS	C	B	B	B	C		B	A	C	B	C	C
Approach Vol, veh/h	573			300			521			509		
Approach Delay, s/veh	22.1			23.8			31.0			20.8		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	12.6	24.4		33.6	10.5	26.4				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	11.5	6.2	16.6		9.8	4.4	11.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8		0.1	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	118	0	771	13	126	507	0
Future Volume (vph)	0	0	0	0	0	118	0	771	13	126	507	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Satd. Flow (prot)	0	1863	0	0	1611	0	0	1724	0	0	1752	0
Flt Permitted											0.990	
Satd. Flow (perm)	0	1863	0	0	1611	0	0	1724	0	0	1752	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	131	0	0	871	0	0	703	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 92.3% ICU Level of Service F

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2026 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	118	0	771	13	126	507	0
Future Vol, veh/h	0	0	0	0	0	118	0	771	13	126	507	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	9	2	2	10	2
Mvmt Flow	0	0	0	0	0	131	0	857	14	140	563	0

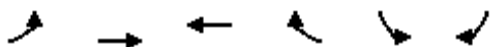
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1773	1714	563	1707	1707	864	563	0	0	871	0	0
Stage 1	843	843	-	864	864	-	-	-	-	-	-	-
Stage 2	930	871	-	843	843	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	65	90	526	72	91	370	1008	-	-	657	-	-
Stage 1	358	380	-	349	371	-	-	-	-	-	-	-
Stage 2	321	368	-	358	380	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	32	62	526	55	63	370	1008	-	-	657	-	-
Mov Cap-2 Maneuver	32	62	-	55	63	-	-	-	-	-	-	-
Stage 1	358	262	-	349	371	-	-	-	-	-	-	-
Stage 2	207	368	-	247	262	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	20	0	2.4
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1008	-	-	-	370	657	-
HCM Lane V/C Ratio	-	-	-	-	0.354	0.213	-
HCM Control Delay (s)	0	-	-	0	20	12	0
HCM Lane LOS	A	-	-	A	C	B	A
HCM 95th %tile Q(veh)	0	-	-	-	1.6	0.8	-

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

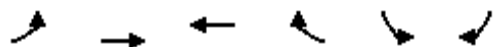
2026 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	289	389	32	50	131
Future Volume (vph)	101	289	389	32	50	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1710	1651	1714	1500	1676	1500
Flt Permitted	0.424				0.950	
Satd. Flow (perm)	763	1651	1714	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				36		146
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2697		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	9%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	321	432	36	56	146
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	22.0	22.0	22.0	22.0	13.0
Total Split (s)	13.0	58.0	45.0	45.0	22.0	13.0
Total Split (%)	16.3%	72.5%	56.3%	56.3%	27.5%	16.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	65.6	67.6	52.7	52.7	9.3	17.3
Actuated g/C Ratio	0.82	0.84	0.66	0.66	0.12	0.22
v/c Ratio	0.16	0.23	0.38	0.04	0.29	0.33
Control Delay	3.0	3.0	9.4	3.2	35.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	3.0	9.4	3.2	35.4	6.0
LOS	A	A	A	A	D	A
Approach Delay		3.0	9.0		14.1	
Approach LOS		A	A		B	
Queue Length 50th (ft)	11	37	105	0	26	0
Queue Length 95th (ft)	26	73	195	12	58	37
Internal Link Dist (ft)		730	2617		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	726	1395	1128	999	356	447

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2026 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.15	0.23	0.38	0.04	0.16	0.33

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 7.6

Intersection LOS: A

Intersection Capacity Utilization 43.4%

ICU Level of Service A

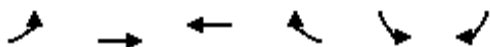
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2026 Build
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	289	389	32	50	131
Future Volume (veh/h)	101	289	389	32	50	131
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	1800	1674	1730	1772	1772	1772
Adj Flow Rate, veh/h	112	321	432	36	56	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	9	5	2	2	2
Cap, veh/h	635	1249	1081	939	218	281
Arrive On Green	0.06	0.75	0.63	0.63	0.13	0.13
Sat Flow, veh/h	1714	1674	1730	1502	1688	1502
Grp Volume(v), veh/h	112	321	432	36	56	146
Grp Sat Flow(s),veh/h/ln	1714	1674	1730	1502	1688	1502
Q Serve(g_s), s	1.6	4.8	10.0	0.7	2.4	7.0
Cycle Q Clear(g_c), s	1.6	4.8	10.0	0.7	2.4	7.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	635	1249	1081	939	218	281
V/C Ratio(X)	0.18	0.26	0.40	0.04	0.26	0.52
Avail Cap(c_a), veh/h	707	1249	1081	939	359	407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.7	3.2	7.5	5.8	31.4	29.3
Incr Delay (d2), s/veh	0.1	0.5	1.1	0.1	0.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.0	3.1	0.2	1.0	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.8	3.7	8.6	5.8	32.0	30.7
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		433	468		202	
Approach Delay, s/veh		4.0	8.4		31.1	
Approach LOS		A	A		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.7	55.0			64.7	15.3
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	39.0			52.0	16.0
Max Q Clear Time (g_c+I1), s	3.6	12.0			6.8	9.0
Green Ext Time (p_c), s	0.1	1.7			1.2	0.4

Intersection Summary

HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2026 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	311	422	38	36	3
Future Volume (vph)	3	311	422	38	36	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1716	0	1569	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1318	1693	1716	0	1569	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	342	506	0	43	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	311	422	38	36	3
Future Vol, veh/h	3	311	422	38	36	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	342	464	42	40	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	506	0	-	0	833	485
Stage 1	-	-	-	-	485	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.4	-	-	-	6.84	6.7
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	3.3	-	-	-	3	3.4
Pot Cap-1 Maneuver	735	-	-	-	342	535
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	786	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	735	-	-	-	341	535
Mov Cap-2 Maneuver	-	-	-	-	481	-
Stage 1	-	-	-	-	661	-
Stage 2	-	-	-	-	786	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.1		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	735	-	-	-	485	
HCM Lane V/C Ratio	0.004	-	-	-	0.088	
HCM Control Delay (s)	9.9	-	-	-	13.1	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Lanes, Volumes, Timings
31: Ridge Run Rd & Site Driveway

2026 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	10	14	27	29	0
Future Volume (vph)	0	10	14	27	29	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1630	1632	0
Flt Permitted				0.983		
Satd. Flow (perm)	1611	0	0	1630	1632	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	435			1286	904	
Travel Time (s)	11.9			25.1	17.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	12%	7%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	46	32	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
31: Ridge Run Rd & Site Driveway

2026 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	14	27	29	0
Future Vol, veh/h	0	10	14	27	29	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	12	7	2
Mvmt Flow	0	11	16	30	32	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	94	32	32	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	62	-	-	-	-	-
Critical Hdwy	6.42	6.22	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	1055	1114	1177	-	-	-
Stage 1	1159	-	-	-	-	-
Stage 2	1122	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1040	1114	1177	-	-	-
Mov Cap-2 Maneuver	1040	-	-	-	-	-
Stage 1	1143	-	-	-	-	-
Stage 2	1122	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.3	2.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1177	-	1114	-	-	
HCM Lane V/C Ratio	0.013	-	0.01	-	-	
HCM Control Delay (s)	8.1	0	8.3	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2026 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	23	34	6	43	120	46	334	9	32	188	77
Future Volume (vph)	68	23	34	6	43	120	46	334	9	32	188	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1304	0	0	1537	0	0	1665	0	0	1514	0
Flt Permitted		0.973			0.998			0.994			0.995	
Satd. Flow (perm)	0	1304	0	0	1537	0	0	1665	0	0	1514	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	130	0	0	176	0	0	405	0	0	309	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	55.2%											
Analysis Period (min)	15											
	ICU Level of Service B											

Intersection	
Intersection Delay, s/veh	15.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	68	23	34	6	43	120	46	334	9	32	188	77
Future Vol, veh/h	68	23	34	6	43	120	46	334	9	32	188	77
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	71	24	35	6	45	125	48	348	9	33	196	80
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.7	11.3	18.6	15.3
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	54%	4%	11%
Vol Thru, %	86%	18%	25%	63%
Vol Right, %	2%	27%	71%	26%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	389	125	169	297
LT Vol	46	68	6	32
Through Vol	334	23	43	188
RT Vol	9	34	120	77
Lane Flow Rate	405	130	176	309
Geometry Grp	1	1	1	1
Degree of Util (X)	0.644	0.257	0.286	0.515
Departure Headway (Hd)	5.718	7.098	5.847	5.99
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	628	503	609	597
Service Time	3.787	5.196	3.94	4.065
HCM Lane V/C Ratio	0.645	0.258	0.289	0.518
HCM Control Delay	18.6	12.7	11.3	15.3
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	4.6	1	1.2	2.9

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	751	86	222	593	124	152
Future Volume (vph)	751	86	222	593	124	152
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1803	0	1744	1958	1576	0
Flt Permitted			0.089		0.978	
Satd. Flow (perm)	1803	0	163	1958	1576	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	11					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	920	0	244	652	303	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	1.00		0.91	0.50	0.92	
Control Delay	50.0		44.8	7.2	66.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	50.0		44.8	7.2	66.1	
LOS	D		D	A	E	
Approach Delay	50.0			17.5	66.1	
Approach LOS	D			B	E	
Queue Length 50th (ft)	427		63	136	149	
Queue Length 95th (ft)	#708		m#108	m160	#296	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	924		268	1292	330	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	1.00		0.91	0.50	0.92	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 38.6	Intersection LOS: D
Intersection Capacity Utilization 89.3%	ICU Level of Service E
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	46 s	22 s
↖ Ø6 (R)		
58 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2026 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	751	86	222	593	124	152
Future Volume (veh/h)	751	86	222	593	124	152
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	825	86	244	652	136	167
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	788	82	281	1379	156	191
Arrive On Green	0.51	0.50	0.20	1.00	0.21	0.20
Sat Flow, veh/h	1545	161	1914	2090	742	911
Grp Volume(v), veh/h	0	911	244	652	304	0
Grp Sat Flow(s),veh/h/ln	0	1706	1914	2090	1659	0
Q Serve(g_s), s	0.0	40.8	5.9	0.0	14.2	0.0
Cycle Q Clear(g_c), s	0.0	40.8	5.9	0.0	14.2	0.0
Prop In Lane		0.09	1.00		0.45	0.55
Lane Grp Cap(c), veh/h	0	870	281	1379	348	0
V/C Ratio(X)	0.00	1.05	0.87	0.47	0.87	0.00
Avail Cap(c_a), veh/h	0	870	281	1379	348	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	19.6	19.3	0.0	30.8	0.0
Incr Delay (d2), s/veh	0.0	43.5	23.7	1.2	23.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	33.6	6.8	0.8	12.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	63.2	43.0	1.2	54.5	0.0
LnGrp LOS	A	F	D	A	D	A
Approach Vol, veh/h	911			896	304	
Approach Delay, s/veh	63.2			12.6	54.5	
Approach LOS	E			B	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.0	46.0		22.0		58.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	7.9	42.8		16.2		2.0
Green Ext Time (p_c), s	0.0	0.0		0.0		21.6
Intersection Summary						
HCM 6th Ctrl Delay			40.4			
HCM 6th LOS			D			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	937	0	0	1090	99	1	0	2	43	0	48
Future Volume (vph)	28	937	0	0	1090	99	1	0	2	43	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	1008	0	0	1278	0	0	3	0	46	52	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 76.2%

ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	937	0	0	1090	99	1	0	2	43	0	48
Future Vol, veh/h	28	937	0	0	1090	99	1	0	2	43	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	30	1008	0	0	1172	106	1	0	2	46	0	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1278	0	0	1008	0	0	2320	2346	1008	2294	2293	1226
Stage 1	-	-	-	-	-	-	1068	1068	-	1225	1225	-
Stage 2	-	-	-	-	-	-	1252	1278	-	1069	1068	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	524	-	-	380	-	-	36	48	324	~ 43	58	252
Stage 1	-	-	-	-	-	-	334	339	-	295	311	-
Stage 2	-	-	-	-	-	-	266	276	-	354	359	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	524	-	-	380	-	-	27	45	324	~ 41	55	252
Mov Cap-2 Maneuver	-	-	-	-	-	-	27	45	-	~ 41	55	-
Stage 1	-	-	-	-	-	-	315	320	-	278	311	-
Stage 2	-	-	-	-	-	-	211	276	-	332	339	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	59.7	170.2
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	69	524	-	-	380	-	-	41	252
HCM Lane V/C Ratio	0.047	0.057	-	-	-	-	-	1.128	0.205
HCM Control Delay (s)	59.7	12.3	-	-	0	-	-	\$ 334.6	22.9
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	4.5	0.8

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	751	37	153	901	17	270	3	117	24	8	16
Future Volume (vph)	14	751	37	153	901	17	270	3	117	24	8	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1747	0
Flt Permitted	0.204			0.096			0.741			0.677		
Satd. Flow (perm)	355	1766	1550	159	1697	1608	1316	1576	0	1255	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40		122			17	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	782	39	159	939	18	281	125	0	25	25	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.6	37.6	37.6	51.8	50.5	50.5	18.8	18.8		18.8	18.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.65	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.09	0.94	0.05	0.64	0.88	0.02	0.91	0.27		0.08	0.06	
Control Delay	12.5	27.9	0.2	28.6	12.5	0.1	64.7	7.1		24.7	14.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	12.5	27.9	0.2	28.6	12.5	0.1	64.7	7.1		24.7	14.4	
LOS	B	C	A	C	B	A	E	A		C	B	
Approach Delay		26.3			14.6			46.9			19.5	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	3	217	0	26	26	0	136	1		10	3	
Queue Length 95th (ft)	m4	m253	m0	m63	#634	m0	#277	41		29	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	167	831	790	253	1070	1029	314	469		299	430	
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	0.09	0.94	0.05	0.63	0.88	0.02	0.89	0.27		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 24.2

Intersection LOS: C

Intersection Capacity Utilization 98.8%

ICU Level of Service F

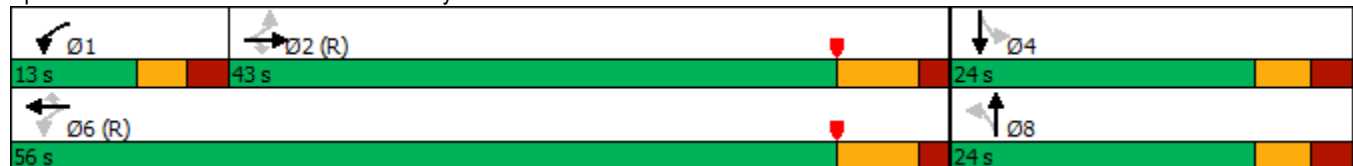
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	751	37	153	901	17	270	3	117	24	8	16
Future Volume (veh/h)	14	751	37	153	901	17	270	3	117	24	8	16
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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	15	782	24	159	939	15	281	3	82	25	8	14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	411	1006	864	533	1103	980	425	14	375	367	158	276
Arrive On Green	0.99	0.99	0.99	0.17	1.00	1.00	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	648	2032	1745	1666	1736	1542	1470	59	1625	1415	685	1198
Grp Volume(v), veh/h	15	782	24	159	939	15	281	0	85	25	0	22
Grp Sat Flow(s),veh/h/ln	648	2032	1745	1666	1736	1542	1470	0	1685	1415	0	1882
Q Serve(g_s), s	0.0	1.3	0.0	3.3	0.0	0.0	14.6	0.0	3.3	1.2	0.0	0.7
Cycle Q Clear(g_c), s	0.0	1.3	0.0	3.3	0.0	0.0	14.8	0.0	3.3	4.0	0.0	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.64
Lane Grp Cap(c), veh/h	411	1006	864	533	1103	980	425	0	389	367	0	434
V/C Ratio(X)	0.04	0.78	0.03	0.30	0.85	0.02	0.66	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	411	1006	864	570	1103	980	437	0	402	378	0	449
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)	1.00	1.00	1.00	0.57	0.57	0.57	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.2	0.2	0.2	6.2	0.0	0.0	29.5	0.0	25.3	26.4	0.0	24.2
Incr Delay (d2), s/veh	0.2	5.9	0.1	0.2	5.0	0.0	3.6	0.0	0.3	0.1	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(95%),veh/ln	0.0	3.2	0.0	1.5	2.7	0.0	9.3	0.0	2.4	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.4	6.1	0.3	6.4	5.0	0.0	33.1	0.0	25.6	26.4	0.0	24.3
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	821		1113				366				47	
Approach Delay, s/veh	5.8		5.1				31.3				25.4	
Approach LOS	A		A				C				C	
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	11.2	45.4	23.4			56.6		23.4				
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8		* 5.9				
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2		* 18				
Max Q Clear Time (g_c+I1), s	5.8	3.8	6.5			2.5		17.3				
Green Ext Time (p_c), s	0.1	1.0	0.1			1.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay 9.8
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	578	1	10	906	74	9	2	1	42	3	113
Future Volume (vph)	85	578	1	10	906	74	9	2	1	42	3	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%				-1%
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.144			0.434				0.721		0.750		
Satd. Flow (perm)	254	1729	0	724	1818	1561	0	1364	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			119	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	609	0	11	954	78	0	12	0	44	122	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.9	64.1		55.3	55.3	55.3		9.2		9.2	9.2	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.28	0.44		0.02	0.76	0.07		0.08		0.28	0.44	
Control Delay	4.0	7.6		4.1	13.9	0.3		30.0		36.2	12.2	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.0	7.6		4.1	14.2	0.3		30.0		36.2	12.2	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		7.1			13.0			30.0			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	8	180		1	393	1		5		21	1	
Queue Length 95th (ft)	m15	m294		m2	#670	m0		19		49	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	318	1386		500	1257	1113		229		227	351	
Starvation Cap Reductn	0	0		0	37	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	0.28	0.44		0.02	0.78	0.07		0.05		0.19	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 11.5

Intersection LOS: B

Intersection Capacity Utilization 75.1%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary 10: Driveway/Market Sq Dr & SR 0230

2026 Build
PM Peak Hour

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	85	578	1	10	906	74	9	2	1	42	3	113								
Future Volume (veh/h)	85	578	1	10	906	74	9	2	1	42	3	113								
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	0.99		1.00	0.99		0.98								
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837								
Adj Flow Rate, veh/h	89	608	1	11	954	69	9	2	0	44	3	63								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95								
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0								
Cap, veh/h	522	1341	2	632	1338	1142	112	19	0	208	5	113								
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.06	0.08	0.00	0.08	0.08	0.06								
Sat Flow, veh/h	1629	1679	3	784	1935	1652	401	250	0	1376	70	1474								
Grp Volume(v), veh/h	89	0	609	11	954	69	11	0	0	44	0	66								
Grp Sat Flow(s),veh/h/ln	1629	0	1682	784	1935	1652	651	0	0	1376	0	1544								
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3								
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	1.9	0.0	3.3								
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.95								
Lane Grp Cap(c), veh/h	522	0	1343	632	1338	1142	123	0	0	208	0	118								
V/C Ratio(X)	0.17	0.00	0.45	0.02	0.71	0.06	0.09	0.00	0.00	0.21	0.00	0.56								
Avail Cap(c_a), veh/h	571	0	1343	632	1338	1142	251	0	0	333	0	259								
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)	0.28	0.00	0.28	0.61	0.61	0.61	1.00	0.00	0.00	1.00	0.00	1.00								
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.8	0.0	0.0	35.0	0.0	36.1								
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.0	2.0	0.1	0.3	0.0	0.0	0.5	0.0	4.1								
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(95%),veh/ln	0.3	0.0	0.2	0.0	1.3	0.0	0.4	0.0	0.0	1.5	0.0	2.5								
Unsig. Movement Delay, s/veh																				
LnGrp Delay(d),s/veh	2.1	0.0	0.3	0.0	2.0	0.1	35.1	0.0	0.0	35.5	0.0	40.2								
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D								
Approach Vol, veh/h	698		1034				11		110											
Approach Delay, s/veh	0.5		1.9				35.1		38.3											
Approach LOS	A		A				D		D											
Timer - Assigned Phs	1	2	4		6		8													
Phs Duration (G+Y+Rc), s	8.6	60.7	10.7		69.3		10.7													
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6													
Max Green Setting (Gmax), s	5.5	44.6	12.4		55.6		12.4													
Max Q Clear Time (g_c+I1), s	3.6	2.5	5.3		2.5		5.3													
Green Ext Time (p_c), s	0.0	1.4	0.2		0.7		0.0													
Intersection Summary																				
HCM 6th Ctrl Delay	3.7																			
HCM 6th LOS	A																			

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	526	22	41	793	32	92	36	30	34	44	94
Future Volume (vph)	62	526	22	41	793	32	92	36	30	34	44	94
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1712	0	1573	1679	0	1572	1603	0	0	1801	0
Flt Permitted	0.236			0.397			0.518				0.920	
Satd. Flow (perm)	410	1712	0	657	1679	0	856	1603	0	0	1674	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			4			32			82	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	577	0	43	869	0	97	70	0	0	181	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	56.2	56.2		56.2	56.2		13.9	13.9			13.9	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.17	0.17			0.17	
v/c Ratio	0.23	0.48		0.09	0.74		0.66	0.23			0.51	
Control Delay	2.5	1.9		5.7	13.9		50.0	18.0			20.5	
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0			0.0	
Total Delay	2.5	1.9		5.7	14.3		50.0	18.0			20.5	
LOS	A	A		A	B		D	B			C	
Approach Delay		2.0			13.9			36.6			20.5	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	1	9		6	222		46	16			44	
Queue Length 95th (ft)	3	15		21	#584		88	46			93	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	288	1203		461	1180		288	562			619	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	63		0	0			3	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.23	0.48		0.09	0.78		0.34	0.12			0.29	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 12.5

Intersection LOS: B

Intersection Capacity Utilization 82.8%

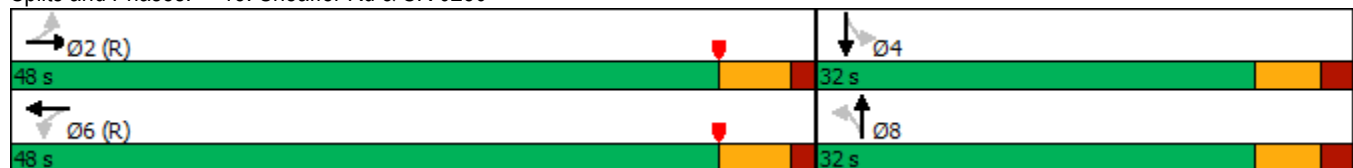
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

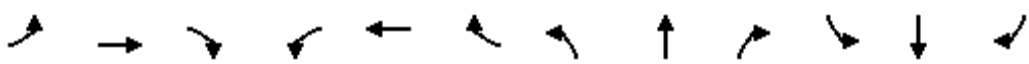
2026 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	526	22	41	793	32	92	36	30	34	44	94
Future Volume (veh/h)	62	526	22	41	793	32	92	36	30	34	44	94
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	65	554	22	43	835	32	97	38	14	36	46	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	396	1209	48	710	1345	52	233	161	59	93	82	114
Arrive On Green	1.00	1.00	1.00	0.74	0.74	0.73	0.14	0.14	0.12	0.12	0.14	0.12
Sat Flow, veh/h	588	1631	65	836	1815	70	1183	1189	438	279	609	845
Grp Volume(v), veh/h	65	0	576	43	0	867	97	0	52	160	0	0
Grp Sat Flow(s),veh/h/ln	588	0	1696	836	0	1885	1183	0	1627	1733	0	0
Q Serve(g_s), s	3.1	0.0	0.0	1.1	0.0	17.7	0.3	0.0	2.3	4.4	0.0	0.0
Cycle Q Clear(g_c), s	20.8	0.0	0.0	1.1	0.0	17.7	7.4	0.0	2.3	7.1	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.04	1.00		0.27	0.22		0.49
Lane Grp Cap(c), veh/h	396	0	1257	710	0	1397	233	0	220	268	0	0
V/C Ratio(X)	0.16	0.00	0.46	0.06	0.00	0.62	0.42	0.00	0.24	0.60	0.00	0.00
Avail Cap(c_a), veh/h	396	0	1257	710	0	1397	473	0	549	611	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)	0.91	0.00	0.91	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.1	0.0	0.0	2.8	0.0	5.0	33.1	0.0	31.0	33.3	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	1.1	0.2	0.0	2.1	1.2	0.0	0.5	2.1	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(95%),veh/ln	0.4	0.0	0.7	0.3	0.0	8.3	3.3	0.0	1.6	5.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.9	0.0	1.1	3.0	0.0	7.1	34.3	0.0	31.6	35.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	641				910				149			
Approach Delay, s/veh	1.4				6.9				33.4			
Approach LOS	A				A				C			
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	64.2			15.8			64.2			15.8		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			9.1			19.7			9.4		
Green Ext Time (p_c), s	18.4			0.4			18.5			0.4		
Intersection Summary												
HCM 6th Ctrl Delay	9.6											
HCM 6th LOS	A											
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	702	0	123	375	186	0	0	266	47
Future Volume (vph)	0	0	0	702	0	123	375	186	0	0	266	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.344					
Satd. Flow (perm)	0	0	0	0	1653	1414	575	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	739	129	395	196	0	0	280	49
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.5	25.5	29.3	29.3			16.3	16.3
Actuated g/C Ratio					0.40	0.40	0.46	0.46			0.25	0.25
v/c Ratio					1.13	0.20	1.02	0.28			0.67	0.09
Control Delay					98.8	2.8	70.1	12.3			30.5	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					98.8	2.8	70.1	12.3			30.5	0.4
LOS					F	A	E	B			C	A
Approach Delay					84.6			50.9			26.0	
Approach LOS					F			D			C	
Queue Length 50th (ft)					~352	0	~108	45			98	0
Queue Length 95th (ft)					#543	22	#292	85			#175	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2026 Build

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					655	652	388	705			438	537
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					1.13	0.20	1.02	0.28			0.64	0.09

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 64.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 62.7

Intersection LOS: E

Intersection Capacity Utilization 154.3%

ICU Level of Service H

Analysis Period (min) 15

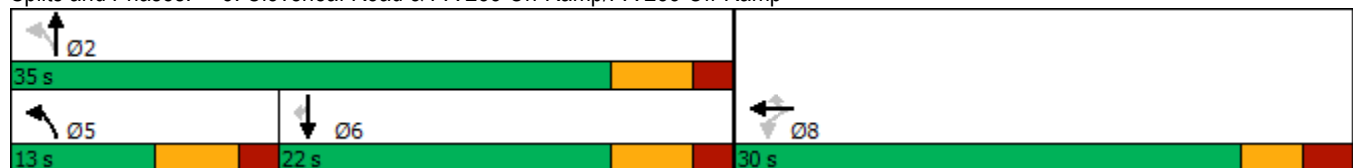
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	702	0	123	375	186	0	0	266	47
Future Volume (veh/h)	0	0	0	702	0	123	375	186	0	0	266	47
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				739	0	0	395	196	0	0	280	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				737	0		411	686	0	0	399	
Arrive On Green				0.40	0.00	0.00	0.13	0.43	0.00	0.00	0.22	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				739	0	0	395	196	0	0	280	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				25.5	0.0	0.0	8.0	5.0	0.0	0.0	8.9	0.0
Cycle Q Clear(g_c), s				25.5	0.0	0.0	8.0	5.0	0.0	0.0	8.9	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				737	0		411	686	0	0	399	
V/C Ratio(X)				1.00	0.00		0.96	0.29	0.00	0.00	0.70	
Avail Cap(c_a), veh/h				737	0		411	768	0	0	492	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.6	0.0	0.0	19.7	11.3	0.0	0.0	22.1	0.0
Incr Delay (d2), s/veh				33.9	0.0	0.0	34.2	0.8	0.0	0.0	8.1	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
%ile BackOfQ(95%),veh/ln				23.1	0.0	0.0	9.6	2.8	0.0	0.0	7.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				52.6	0.0	0.0	53.9	12.1	0.0	0.0	30.2	0.0
LnGrp LOS				F	A		D	B	A	A	C	
Approach Vol, veh/h					739			591			280	
Approach Delay, s/veh					52.6			40.0			30.2	
Approach LOS					D			D			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.8			13.0	18.8		30.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		24.5				
Max Q Clear Time (g_c+I1), s		7.0			10.0	10.9		27.5				
Green Ext Time (p_c), s		3.9			0.0	1.9		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				44.1								
HCM 6th LOS				D								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	3	591	0	0	0	0	522	579	98	877	0
Future Volume (vph)	43	3	591	0	0	0	0	522	579	98	877	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1564	1569	0	0	0	0	1666	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1564	1569	0	0	0	0	1666	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	609	0	0	0	0	1135	0	101	904	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 154.3%

ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2026 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	69.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	43	3	591	0	0	0	0	522	579	98	877	0
Future Vol, veh/h	43	3	591	0	0	0	0	522	579	98	877	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	44	3	609	0	0	0	0	538	597	101	904	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1644	1644	904	-	0	0	538	0	0
Stage 1	1106	1106	-	-	-	-	-	-	-
Stage 2	538	538	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	100	132	~ 379	0	-	-	798	-	0
Stage 1	381	347	-	0	-	-	-	-	0
Stage 2	671	575	-	0	-	-	-	-	0
Platoon blocked, %				-	-	-	-	-	-
Mov Cap-1 Maneuver	87	0	~ 379	-	-	-	798	-	-
Mov Cap-2 Maneuver	87	0	-	-	-	-	-	-	-
Stage 1	381	0	-	-	-	-	-	-	-
Stage 2	586	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	295	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	87	379	798	-
HCM Lane V/C Ratio	-	-	0.545	1.608	0.127	-
HCM Control Delay (s)	-	-	87.6	311.1	10.2	-
HCM Lane LOS	-	-	F	F	B	-
HCM 95th %tile Q(veh)	-	-	2.4	35.3	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	1086	1441	10
Future Volume (vph)	3	9	8	1086	1441	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1801	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	1128	1496	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	86.4%			ICU Level of Service E		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	1086	1441	10
Future Vol, veh/h	3	9	8	1086	1441	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	1120	1486	10

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2627	1491	1496	0	-	0
Stage 1	1491	-	-	-	-	-
Stage 2	1136	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	28	158	415	-	-	-
Stage 1	224	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	158	415	-	-	-
Mov Cap-2 Maneuver	27	-	-	-	-	-
Stage 1	213	-	-	-	-	-
Stage 2	338	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	66.1	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	415	-	71	-	-
HCM Lane V/C Ratio	0.02	-	0.174	-	-
HCM Control Delay (s)	13.9	0	66.1	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	34	111	9	41	36	94	844	13	49	1083	322
Future Volume (vph)	220	34	111	9	41	36	94	844	13	49	1083	322
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1662	0	1416	1704	0	1620	1696	0	1628	1685	0
Flt Permitted	0.704			0.660			0.107			0.180		
Satd. Flow (perm)	1200	1662	0	984	1704	0	182	1696	0	308	1685	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		97			38			3			48	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	232	153	0	9	81	0	99	902	0	52	1479	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	0.97	0.37		0.05	0.22		0.88	0.85		0.27	1.38	
Control Delay	79.7	12.1		20.2	14.2		43.7	15.8		9.5	194.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	79.7	12.1		20.2	14.2		43.7	15.8		9.5	194.9	
LOS	E	B		C	B		D	B		A	F	
Approach Delay		52.8			14.8			18.5			188.6	
Approach LOS		D			B			B			F	
Queue Length 50th (ft)	84	17		3	13		38	331		7	~738	
Queue Length 95th (ft)	#205	60		13	44		m40	m294		26	#974	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	410		196	371		113	1061		192	1071	
Starvation Cap Reductn	0	0		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	0.97	0.37		0.05	0.22		0.88	0.85		0.27	1.38	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.38

Intersection Signal Delay: 109.4

Intersection LOS: F

Intersection Capacity Utilization 110.7%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2026 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	34	111	9	41	36	94	844	13	49	1083	322
Future Volume (veh/h)	220	34	111	9	41	36	94	844	13	49	1083	322
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	232	36	93	9	43	24	99	888	13	52	1140	328
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	355	102	264	269	219	122	120	1140	17	226	896	258
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1407	510	1318	1076	1097	612	369	1823	27	644	1434	413
Grp Volume(v), veh/h	232	0	129	9	0	67	99	0	901	52	0	1468
Grp Sat Flow(s),veh/h/ln	1407	0	1828	1076	0	1710	369	0	1850	644	0	1846
Q Serve(g_s), s	9.9	0.0	3.7	0.4	0.0	2.0	0.0	0.0	27.6	4.4	0.0	37.5
Cycle Q Clear(g_c), s	11.8	0.0	3.7	4.1	0.0	2.0	37.5	0.0	27.6	32.0	0.0	37.5
Prop In Lane	1.00		0.72	1.00		0.36	1.00		0.01	1.00		0.22
Lane Grp Cap(c), veh/h	355	0	366	269	0	342	120	0	1156	226	0	1154
V/C Ratio(X)	0.65	0.00	0.35	0.03	0.00	0.20	0.82	0.00	0.78	0.23	0.00	1.27
Avail Cap(c_a), veh/h	355	0	366	269	0	342	120	0	1156	226	0	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.00	0.09	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	21.0	22.4	0.0	20.1	42.6	0.0	19.9	22.8	0.0	11.4
Incr Delay (d2), s/veh	4.2	0.0	0.6	0.0	0.0	0.3	5.9	0.0	0.5	2.4	0.0	129.4
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(95%),veh/ln	6.1	0.0	2.7	0.2	0.0	1.3	2.4	0.0	14.9	1.3	0.0	74.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	21.6	22.5	0.0	20.4	48.5	0.0	20.4	25.2	0.0	140.7
LnGrp LOS	C	A	C	C	A	C	D	A	C	C	A	F
Approach Vol, veh/h	361			76			1000			1520		
Approach Delay, s/veh	26.4			20.7			23.2			136.8		
Approach LOS	C			C			C			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	29.6			13.8			39.5			6.1		
Green Ext Time (p_c), s	6.2			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	81.9											
HCM 6th LOS	F											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	17	61	0	154	16	784	5	129	1038	34
Future Volume (vph)	15	0	17	61	0	154	16	784	5	129	1038	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1619	0	0	1639	0	0	1716	1648
Flt Permitted		0.460			0.899			0.712			0.830	
Satd. Flow (perm)	0	800	1581	0	1476	0	0	1168	0	0	1433	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		162			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	18	0	226	0	0	847	0	0	1229	36
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.7			41.8			41.8	41.8
Actuated g/C Ratio		0.14	0.14		0.14			0.70			0.70	0.70
v/c Ratio		0.14	0.07		0.64			1.04			1.23	0.03
Control Delay		24.2	1.4		17.1			56.8			118.0	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		24.2	1.4		17.1			56.8			118.0	0.1
LOS		C	A		B			E			F	A
Approach Delay		12.1			17.1			56.8			114.7	
Approach LOS		B			B			E			F	
Queue Length 50th (ft)		5	0		21			~364			~611	0
Queue Length 95th (ft)		20	3		78			m#905			m33	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		140	322		391			813			997	1161
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		0.11	0.06		0.58			1.04			1.23	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.23

Intersection Signal Delay: 83.2

Intersection LOS: F

Intersection Capacity Utilization 142.3%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

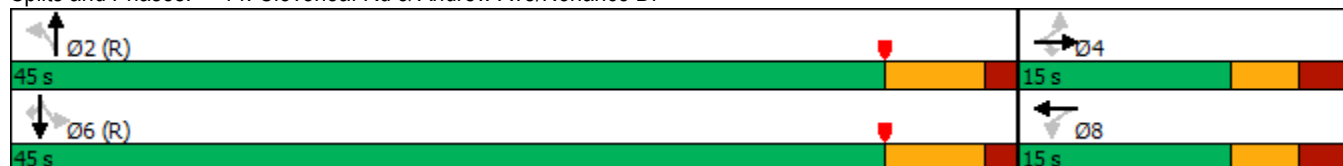
Queue shown is maximum after two cycles.

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	17	61	0	154	16	784	5	129	1038	34
Future Volume (veh/h)	15	0	17	61	0	154	16	784	5	129	1038	34
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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	10	64	0	147	17	825	5	136	1093	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	300	0	278	143	17	190	61	708	4	130	697	1101
Arrive On Green	0.16	0.00	0.17	0.16	0.00	0.16	0.86	0.89	0.86	1.00	1.00	1.00
Sat Flow, veh/h	1031	0	1586	372	100	1084	0	1062	6	95	1045	1652
Grp Volume(v), veh/h	16	0	10	211	0	0	847	0	0	1229	0	35
Grp Sat Flow(s),veh/h/ln	1031	0	1586	1556	0	0	1068	0	0	1140	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.3	7.9	0.0	0.0	39.0	0.0	0.0	39.0	0.0	0.0
Prop In Lane	1.00		1.00	0.30		0.70	0.02		0.01	0.11		1.00
Lane Grp Cap(c), veh/h	283	0	278	325	0	0	756	0	0	807	0	1101
V/C Ratio(X)	0.06	0.00	0.04	0.65	0.00	0.00	1.12	0.00	0.00	1.52	0.00	0.03
Avail Cap(c_a), veh/h	283	0	278	325	0	0	756	0	0	807	0	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	21.2	0.0	20.5	24.1	0.0	0.0	13.0	0.0	0.0	4.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	4.5	0.0	0.0	71.2	0.0	0.0	235.5	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(95%),veh/ln	0.3	0.0	0.2	5.8	0.0	0.0	29.1	0.0	0.0	77.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	20.6	28.6	0.0	0.0	84.2	0.0	0.0	239.8	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	F	A	A	F	A	A
Approach Vol, veh/h	26			211			847			1264		
Approach Delay, s/veh	21.0			28.6			84.2			233.2		
Approach LOS	C			C			F			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			15.0			45.0			15.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	41.0			2.8			41.0			9.9		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	158.7											
HCM 6th LOS	F											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	392	59	176	505	134	94	302	95	219	306	230
Future Volume (vph)	244	392	59	176	505	134	94	302	95	219	306	230
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1763	0	1604	1640	1442
Flt Permitted	0.114			0.525			0.425			0.120		
Satd. Flow (perm)	191	1791	1435	836	1697	1577	681	1763	0	203	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159			12			237
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	252	404	61	181	521	138	97	409	0	226	315	237
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	60.5	60.5	60.5	38.4	38.4	38.4	36.7	28.0		47.2	33.2	33.2
Actuated g/C Ratio	0.50	0.50	0.50	0.32	0.32	0.32	0.31	0.23		0.39	0.28	0.28
v/c Ratio	0.87	0.45	0.08	0.68	0.96	0.23	0.36	0.97		0.93	0.69	0.42
Control Delay	55.6	20.6	0.9	53.0	73.6	9.0	28.7	83.3		44.2	35.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.6	20.6	0.9	53.0	73.6	9.0	28.7	83.3		44.2	35.3	6.1
LOS	E	C	A	D	E	A	C	F		D	D	A
Approach Delay		31.2			58.5			72.9			29.0	
Approach LOS		C			E			E			C	
Queue Length 50th (ft)	130	187	0	137	418	14	49	~336		135	203	25
Queue Length 95th (ft)	#271	267	7	220	#617	m49	89	#538		m112	m163	m13
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	300	932	795	275	558	625	272	420		243	454	570
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.84	0.43	0.08	0.66	0.93	0.22	0.36	0.97		0.93	0.69	0.42

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 46.1

Intersection LOS: D

Intersection Capacity Utilization 97.2%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

			
Ø1	Ø2	Ø3	Ø4 (R)
23 s	45 s	20 s	32 s
			
Ø6	Ø7	Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	244	392	59	176	505	134	94	302	95	219	306	230
Future Volume (veh/h)	244	392	59	176	505	134	94	302	95	219	306	230
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	252	404	31	181	521	0	97	311	97	226	315	166
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	302	871	744	330	543		326	410	128	321	517	438
Arrive On Green	0.12	0.48	0.48	0.61	0.61	0.00	0.06	0.26	0.25	0.12	0.31	0.31
Sat Flow, veh/h	1736	1823	1557	879	1766	1544	1880	1576	492	1616	1655	1402
Grp Volume(v), veh/h	252	404	31	181	521	0	97	0	408	226	315	166
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	879	1766	1544	1880	0	2068	1616	1655	1402
Q Serve(g_s), s	11.2	17.8	1.3	16.2	33.3	0.0	4.4	0.0	21.9	11.8	19.4	11.1
Cycle Q Clear(g_c), s	11.2	17.8	1.3	16.2	33.3	0.0	4.4	0.0	21.9	11.8	19.4	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	302	871	744	330	543		326	0	537	321	517	438
V/C Ratio(X)	0.83	0.46	0.04	0.55	0.96		0.30	0.00	0.76	0.70	0.61	0.38
Avail Cap(c_a), veh/h	339	950	811	349	581		347	0	537	321	517	438
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	21.0	16.7	19.1	22.4	0.0	29.7	0.0	41.1	28.5	35.0	32.2
Incr Delay (d2), s/veh	15.0	0.1	0.0	0.7	26.2	0.0	0.5	0.0	9.7	6.8	5.3	2.5
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(95%),veh/ln	9.4	11.6	0.8	4.1	16.7	0.0	3.7	0.0	18.5	8.7	13.1	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.3	21.2	16.7	19.9	48.6	0.0	30.2	0.0	50.8	35.3	40.3	34.6
LnGrp LOS	D	C	B	B	D		C	A	D	D	D	C
Approach Vol, veh/h	687			702			505			707		
Approach Delay, s/veh	28.7			41.2			46.8			37.4		
Approach LOS	C			D			D			D		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.4	42.4	20.0	37.2		62.8	13.7	43.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	13.7	35.8	14.3	23.9		20.3	6.9	21.9				
Green Ext Time (p_c), s	0.3	0.1	0.0	0.3		0.1	0.0	1.6				

Intersection Summary

HCM 6th Ctrl Delay	38.0
HCM 6th LOS	D

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	270	0	570	74	276	793	0
Future Volume (vph)	0	0	0	0	0	270	0	570	74	276	793	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1844	1567	1787	1881	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1844	1567	1787	1881	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	293	0	620	80	300	862	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	78.4%											
Analysis Period (min)	15											
ICU Level of Service D												

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2026 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↖	↗	↖	↗	
Traffic Vol, veh/h	0	0	0	0	0	270	0	570	74	276	793	0
Future Vol, veh/h	0	0	0	0	0	270	0	570	74	276	793	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	293	0	620	80	300	862	0

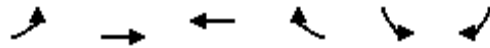
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	862	-	-	620	862	0	0	700	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	355	0	0	513	780	-	-	742	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	355	-	-	513	780	-	-	742	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	21	0	3.4
HCM LOS	A	C		

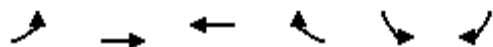
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	780	-	-	-	513	742	-
HCM Lane V/C Ratio	-	-	-	-	0.572	0.404	-
HCM Control Delay (s)	0	-	-	0	21	13.1	-
HCM Lane LOS	A	-	-	A	C	B	-
HCM 95th %tile Q(veh)	0	-	-	-	3.6	2	-

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2026 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	239	467	446	111	164	403
Future Volume (vph)	239	467	446	111	164	403
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1748	1500	1676	1500
Flt Permitted	0.370				0.950	
Satd. Flow (perm)	653	1782	1748	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				123		327
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	3%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	266	519	496	123	182	448
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	13.0	82.0	69.0	69.0	38.0	13.0
Total Split (%)	10.8%	68.3%	57.5%	57.5%	31.7%	10.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	90.5	90.5	72.5	72.5	19.5	37.5
Actuated g/C Ratio	0.75	0.75	0.60	0.60	0.16	0.31
v/c Ratio	0.44	0.39	0.47	0.13	0.67	0.65
Control Delay	8.2	8.4	16.3	2.7	58.7	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	8.4	16.3	2.7	58.7	13.1
LOS	A	A	B	A	E	B
Approach Delay		8.4	13.6		26.3	
Approach LOS		A	B		C	
Queue Length 50th (ft)	86	185	201	0	134	72
Queue Length 95th (ft)	m122	m246	340	29	200	168
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	602	1343	1056	955	460	693



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.44	0.39	0.47	0.13	0.40	0.65

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 15.5

Intersection LOS: B

Intersection Capacity Utilization 60.8%

ICU Level of Service B

Analysis Period (min) 15

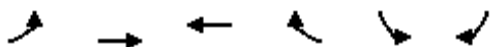
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2026 Build
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	239	467	446	111	164	403
Future Volume (veh/h)	239	467	446	111	164	403
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	1772	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	266	519	496	123	182	448
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	3	2	2	2
Cap, veh/h	439	1146	938	801	464	513
Arrive On Green	0.13	1.00	0.53	0.53	0.28	0.28
Sat Flow, veh/h	1688	1786	1758	1502	1688	1502
Grp Volume(v), veh/h	266	519	496	123	182	448
Grp Sat Flow(s),veh/h/ln	1688	1786	1758	1502	1688	1502
Q Serve(g_s), s	8.0	0.0	22.0	5.0	10.5	33.0
Cycle Q Clear(g_c), s	8.0	0.0	22.0	5.0	10.5	33.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	439	1146	938	801	464	513
V/C Ratio(X)	0.61	0.45	0.53	0.15	0.39	0.87
Avail Cap(c_a), veh/h	439	1146	938	801	464	513
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	18.2	14.2	35.3	37.1
Incr Delay (d2), s/veh	2.4	1.3	2.1	0.4	0.5	15.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.3	0.7	13.7	3.1	7.9	20.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.0	1.3	20.3	14.6	35.9	52.3
LnGrp LOS	B	A	C	B	D	D
Approach Vol, veh/h		785	619		630	
Approach Delay, s/veh		7.0	19.2		47.6	
Approach LOS		A	B		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.0	69.0			82.0	38.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	63.0			76.0	32.0
Max Q Clear Time (g_c+I1), s	10.0	24.0			2.0	35.0
Green Ext Time (p_c), s	0.0	2.4			2.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			23.3			
HCM 6th LOS			C			

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2026 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	586	512	89	74	1
Future Volume (vph)	6	586	512	89	74	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1756	0	1670	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1756	0	1670	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	610	626	0	78	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.2% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	586	512	89	74	1
Future Vol, veh/h	6	586	512	89	74	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	610	533	93	77	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	626	0	-	0	1202	580
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	622	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	755	-	-	-	196	526
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	565	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	755	-	-	-	194	526
Mov Cap-2 Maneuver	-	-	-	-	352	-
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	565	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		18		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	755	-	-	-	354	
HCM Lane V/C Ratio	0.008	-	-	-	0.221	
HCM Control Delay (s)	9.8	-	-	-	18	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.8	

Lanes, Volumes, Timings
31: Ridge Run Rd & Site Driveway

2026 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	36	33	62	39	0
Future Volume (vph)	0	36	33	62	39	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1735	1747	0
Flt Permitted				0.983		
Satd. Flow (perm)	1611	0	0	1735	1747	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	435			1319	1011	
Travel Time (s)	11.9			25.7	19.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	0	0	106	43	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
31: Ridge Run Rd & Site Driveway

2026 Build
PM Peak Hour

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	36	33	62	39	0
Future Vol, veh/h	0	36	33	62	39	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	0	2
Mvmt Flow	0	40	37	69	43	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	186	43	43	0	-	0
Stage 1	43	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.42	6.2	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	930	1098	1169	-	-	-
Stage 1	1145	-	-	-	-	-
Stage 2	1026	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	899	1098	1169	-	-	-
Mov Cap-2 Maneuver	899	-	-	-	-	-
Stage 1	1107	-	-	-	-	-
Stage 2	1026	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	2.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1169	-	1098	-	-	
HCM Lane V/C Ratio	0.031	-	0.036	-	-	
HCM Control Delay (s)	8.2	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2026 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	82	77	4	51	75	33	326	6	106	385	61
Future Volume (vph)	91	82	77	4	51	75	33	326	6	106	385	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1382	0	0	1562	0	0	1673	0	0	1569	0
Flt Permitted		0.982			0.999			0.996			0.991	
Satd. Flow (perm)	0	1382	0	0	1562	0	0	1673	0	0	1569	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	260	0	0	135	0	0	380	0	0	575	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	83.9%											
Analysis Period (min)	15											
ICU Level of Service E												

Intersection	
Intersection Delay, s/veh	56.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	91	82	77	4	51	75	33	326	6	106	385	61
Future Vol, veh/h	91	82	77	4	51	75	33	326	6	106	385	61
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	95	85	80	4	53	78	34	340	6	110	401	64
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	22.2	14.2	28.1	100
HCM LOS	C	B	D	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	36%	3%	19%
Vol Thru, %	89%	33%	39%	70%
Vol Right, %	2%	31%	58%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	365	250	130	552
LT Vol	33	91	4	106
Through Vol	326	82	51	385
RT Vol	6	77	75	61
Lane Flow Rate	380	260	135	575
Geometry Grp	1	1	1	1
Degree of Util (X)	0.738	0.578	0.286	1.113
Departure Headway (Hd)	7.291	8.384	8.01	6.969
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	498	432	451	523
Service Time	5.291	6.384	6.01	5.018
HCM Lane V/C Ratio	0.763	0.602	0.299	1.099
HCM Control Delay	28.1	22.2	14.2	100
HCM Lane LOS	D	C	B	F
HCM 95th-tile Q	6.1	3.6	1.2	18.7

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	756	83	168	654	89	166
Future Volume (vph)	756	83	168	654	89	166
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1841	0	1761	1958	1565	0
Flt Permitted			0.107		0.983	
Satd. Flow (perm)	1841	0	198	1958	1565	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	6					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	848	0	170	661	258	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	59.4		73.6	72.4	27.2	
Actuated g/C Ratio	0.54		0.67	0.66	0.25	
v/c Ratio	0.85		0.65	0.51	0.67	
Control Delay	32.9		19.9	13.2	45.3	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	32.9		19.9	13.2	45.3	
LOS	C		B	B	D	
Approach Delay	32.9			14.6	45.3	
Approach LOS	C			B	D	
Queue Length 50th (ft)	485		49	264	165	
Queue Length 95th (ft)	#852		m83	m400	230	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2026 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	997		260	1288	566	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.85		0.65	0.51	0.46	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 85.1%

ICU Level of Service E

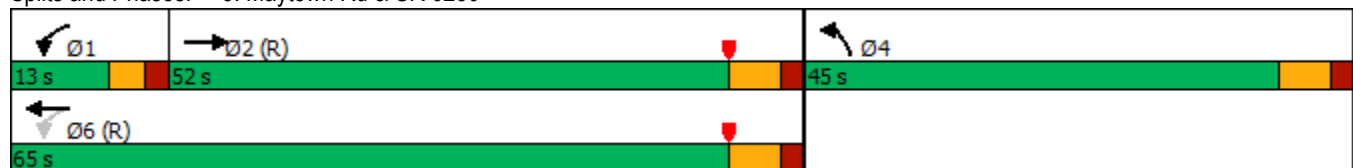
Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2026 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	756	83	168	654	89	166
Future Volume (veh/h)	756	83	168	654	89	166
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	764	82	170	661	90	168
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	957	103	346	1474	115	215
Arrive On Green	0.61	0.60	0.04	0.47	0.20	0.19
Sat Flow, veh/h	1566	168	1927	2090	574	1072
Grp Volume(v), veh/h	0	846	170	661	259	0
Grp Sat Flow(s),veh/h/ln	0	1734	1927	2090	1653	0
Q Serve(g_s), s	0.0	40.8	3.3	23.3	16.4	0.0
Cycle Q Clear(g_c), s	0.0	40.8	3.3	23.3	16.4	0.0
Prop In Lane		0.10	1.00		0.35	0.65
Lane Grp Cap(c), veh/h	0	1059	346	1474	331	0
V/C Ratio(X)	0.00	0.80	0.49	0.45	0.78	0.00
Avail Cap(c_a), veh/h	0	1059	392	1474	598	0
HCM Platoon Ratio	1.00	1.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	16.3	17.3	14.7	42.0	0.0
Incr Delay (d2), s/veh	0.0	6.3	1.1	1.0	13.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	23.1	3.8	17.9	12.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	22.6	18.4	15.7	55.5	0.0
LnGrp LOS	A	C	B	B	E	A
Approach Vol, veh/h	846			831	259	
Approach Delay, s/veh	22.6			16.2	55.5	
Approach LOS	C			B	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.4	72.4		27.2		82.8
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	5.3	42.8		18.4		25.3
Green Ext Time (p_c), s	0.1	2.6		2.7		17.7

Intersection Summary

HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	981	0	1	987	119	0	0	1	68	0	36
Future Volume (vph)	16	981	0	1	987	119	0	0	1	68	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	1022	0	1	1152	0	0	1	0	71	38	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 76.3% ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	12											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	981	0	1	987	119	0	0	1	68	0	36
Future Vol, veh/h	16	981	0	1	987	119	0	0	1	68	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	17	1022	0	1	1028	124	0	0	1	71	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1152	0	0	1022	0	0	2167	2210	1022	2149	2148	1090
Stage 1	-	-	-	-	-	-	1056	1056	-	1092	1092	-
Stage 2	-	-	-	-	-	-	1111	1154	-	1057	1056	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	571	-	-	374	-	-	46	57	318	~ 53	70	300
Stage 1	-	-	-	-	-	-	339	343	-	345	351	-
Stage 2	-	-	-	-	-	-	317	311	-	359	363	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	571	-	-	374	-	-	39	55	318	~ 52	68	300
Mov Cap-2 Maneuver	-	-	-	-	-	-	39	55	-	~ 52	68	-
Stage 1	-	-	-	-	-	-	329	333	-	335	350	-
Stage 2	-	-	-	-	-	-	277	310	-	347	352	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	16.4	253.2
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	318	571	-	-	374	-	-	52	300
HCM Lane V/C Ratio	0.003	0.029	-	-	0.003	-	-	1.362	0.125
HCM Control Delay (s)	16.4	11.5	-	-	14.7	-	-	\$ 377.3	18.7
HCM Lane LOS	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	6.5	0.4

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	764	49	154	844	15	257	3	161	35	4	14
Future Volume (vph)	22	764	49	154	844	15	257	3	161	35	4	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1744	0
Flt Permitted	0.265			0.119			0.745			0.543		
Satd. Flow (perm)	461	1783	1584	197	1697	1573	1329	1574	0	1007	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			169			15
Link Speed (mph)		40			40			25				25
Link Distance (ft)		1060			1340			300				300
Travel Time (s)		18.1			22.8			8.2				8.2
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	804	52	162	888	16	271	172	0	37	19	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	57.1	57.1	57.1	75.5	74.2	74.2	25.1	25.1		25.1	25.1	
Actuated g/C Ratio	0.52	0.52	0.52	0.69	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.10	0.87	0.06	0.55	0.78	0.01	0.89	0.35		0.16	0.05	
Control Delay	19.0	30.5	3.2	25.2	13.2	2.3	72.7	7.7		35.5	17.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	19.0	30.5	3.2	25.2	13.2	2.3	72.7	7.7		35.5	17.4	
LOS	B	C	A	C	B	A	E	A		D	B	
Approach Delay		28.6			14.8			47.5			29.4	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	7	263	0	51	189	0	184	2		21	2	
Queue Length 95th (ft)	m15	m#777	m4	m112	356	m1	#332	56		50	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	239	925	861	354	1145	1070	315	502		238	425	
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	0.10	0.87	0.06	0.46	0.78	0.01	0.86	0.34		0.16	0.04	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 26.0

Intersection LOS: C

Intersection Capacity Utilization 95.6%

ICU Level of Service F

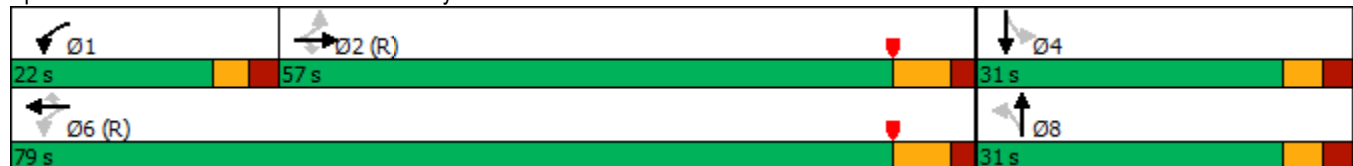
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2026 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	764	49	154	844	15	257	3	161	35	4	14
Future Volume (veh/h)	22	764	49	154	844	15	257	3	161	35	4	14
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	804	30	162	888	11	271	3	104	37	4	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	461	1185	1010	540	1199	1064	380	10	348	292	133	266
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.21	0.21	0.20	0.21	0.21	0.20
Sat Flow, veh/h	682	2047	1743	1666	1736	1540	1489	47	1643	1392	626	1253
Grp Volume(v), veh/h	23	804	30	162	888	11	271	0	107	37	0	12
Grp Sat Flow(s),veh/h/ln	682	2047	1743	1666	1736	1540	1489	0	1691	1392	0	1879
Q Serve(g_s), s	0.0	0.0	0.0	4.0	0.0	0.0	19.3	0.0	5.9	2.5	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.0	0.0	0.0	19.4	0.0	5.9	7.9	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.67
Lane Grp Cap(c), veh/h	461	1185	1010	540	1199	1064	380	0	358	292	0	398
V/C Ratio(X)	0.05	0.68	0.03	0.30	0.74	0.01	0.71	0.00	0.30	0.13	0.00	0.03
Avail Cap(c_a), veh/h	461	1185	1010	687	1199	1064	418	0	401	327	0	446
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(l)	1.00	1.00	1.00	0.63	0.63	0.63	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.1	0.0	0.0	41.8	0.0	36.9	39.6	0.0	34.6
Incr Delay (d2), s/veh	0.2	3.1	0.1	0.2	2.6	0.0	5.1	0.0	0.5	0.2	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(95%),veh/ln	0.0	1.9	0.0	2.0	1.6	0.0	12.2	0.0	4.5	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	3.1	0.1	6.3	2.6	0.0	46.9	0.0	37.4	39.8	0.0	34.7
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	857			1061			378			49		
Approach Delay, s/veh	2.9			3.2			44.2			38.5		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	12.3	69.5	28.2		81.8		28.2					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25		72.2		* 25					
Max Q Clear Time (g_c+I1), s	6.5	2.5	10.4		2.5		21.9					
Green Ext Time (p_c), s	0.3	1.0	0.1		1.2		0.5					

Intersection Summary

HCM 6th Ctrl Delay 10.4
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	711	12	4	826	67	9	3	10	61	39	128
Future Volume (vph)	108	711	12	4	826	67	9	3	10	61	39	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1742	0	1744	1818	1561	0	1765	0	1719	1574	0
Flt Permitted	0.197			0.371				0.591		0.742		
Satd. Flow (perm)	348	1742	0	681	1818	1561	0	1064	0	1342	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				80		11			137	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	778	0	4	888	72	0	24	0	66	180	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	89.0	88.1		75.4	75.4	75.4		11.9		11.9	11.9	
Actuated g/C Ratio	0.81	0.80		0.69	0.69	0.69		0.11		0.11	0.11	
v/c Ratio	0.31	0.56		0.01	0.71	0.07		0.19		0.46	0.62	
Control Delay	5.6	7.6		5.2	15.1	1.0		32.2		54.9	22.6	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	5.6	7.6		5.2	15.4	1.0		32.2		54.9	22.6	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		7.3			14.3			32.2			31.3	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	20	173		1	403	1		8		44	28	
Queue Length 95th (ft)	m32	m286		m2	655	m4		33		85	94	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	396	1395		466	1246	1095		235		285	442	
Starvation Cap Reductn	0	0		0	53	0		0		0	0	
Spillback Cap Reductn	0	14		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.29	0.56		0.01	0.74	0.07		0.10		0.23	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 13.5

Intersection LOS: B

Intersection Capacity Utilization 76.2%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
14 s	68 s	28 s
 Ø6 (R)		 Ø8
82 s		28 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2026 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	711	12	4	826	67	9	3	10	61	39	128
Future Volume (veh/h)	108	711	12	4	826	67	9	3	10	61	39	128
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	116	765	11	4	888	59	10	3	7	66	42	67
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	536	1358	20	591	1403	1198	67	27	24	190	61	97
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09
Sat Flow, veh/h	1629	1668	24	724	1935	1652	185	287	254	1375	635	1013
Grp Volume(v), veh/h	116	0	776	4	888	59	20	0	0	66	0	109
Grp Sat Flow(s),veh/h/ln	1629	0	1692	724	1935	1652	726	0	0	1375	0	1648
Q Serve(g_s), s	1.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.1
Cycle Q Clear(g_c), s	1.8	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	5.5	0.0	7.1
Prop In Lane	1.00		0.01	1.00		1.00	0.50		0.35	1.00		0.61
Lane Grp Cap(c), veh/h	536	0	1377	591	1403	1198	112	0	0	190	0	157
V/C Ratio(X)	0.22	0.00	0.56	0.01	0.63	0.05	0.18	0.00	0.00	0.35	0.00	0.69
Avail Cap(c_a), veh/h	599	0	1377	591	1403	1198	281	0	0	352	0	351
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)	0.43	0.00	0.43	0.79	0.79	0.79	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.4	0.0	0.0	0.0	0.0	0.0	46.0	0.0	0.0	47.5	0.0	48.5
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.7	0.1	0.8	0.0	0.0	1.1	0.0	5.4
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(95%),veh/ln	0.6	0.0	0.5	0.0	1.2	0.0	1.0	0.0	0.0	3.2	0.0	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.5	0.0	0.7	0.0	1.7	0.1	46.8	0.0	0.0	48.6	0.0	53.9
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	892					951		20		175		
Approach Delay, s/veh	1.0					1.6		46.8		51.9		
Approach LOS	A					A		D		D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.7	85.2	15.1		94.9		15.1					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.3	2.5	9.1		2.5		9.1					
Green Ext Time (p_c), s	0.1	1.3	0.5		1.0		0.0					
Intersection Summary												
HCM 6th Ctrl Delay			6.1									
HCM 6th LOS			A									

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	689	24	20	708	13	67	24	17	15	20	75
Future Volume (vph)	54	689	24	20	708	13	67	24	17	15	20	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1747	0	1620	1700	0	1541	1661	0	0	1821	0
Flt Permitted	0.325			0.329			0.537				0.952	
Satd. Flow (perm)	565	1747	0	561	1700	0	871	1661	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			1			18			79	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	750	0	21	759	0	71	43	0	0	116	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.6	86.6		86.6	86.6		13.5	13.5			13.5	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.13	0.55		0.05	0.57		0.66	0.20			0.41	
Control Delay	6.2	8.9		3.8	7.2		73.4	29.1			20.4	
Queue Delay	0.0	0.1		0.0	0.1		0.0	0.0			0.0	
Total Delay	6.2	9.0		3.8	7.3		73.4	29.1			20.4	
LOS	A	A		A	A		E	C			C	
Approach Delay		8.8			7.2			56.7			20.4	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	12	210		3	166		49	16			24	
Queue Length 95th (ft)	m27	260		11	327		93	47			73	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	444	1375		441	1337		324	630			700	
Starvation Cap Reductn	0	82		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	89		0	0			4	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.13	0.58		0.05	0.61		0.22	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.9

Intersection LOS: B

Intersection Capacity Utilization 69.1%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

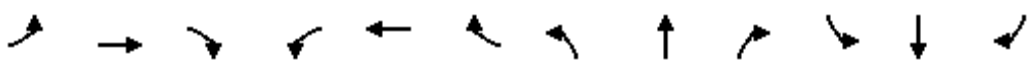
13: Sheaffer Rd & SR 0230

2026 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	689	24	20	708	13	67	24	17	15	20	75
Future Volume (veh/h)	54	689	24	20	708	13	67	24	17	15	20	75
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	57	725	20	21	745	13	71	25	6	16	21	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	537	1402	39	675	1562	27	172	104	25	62	51	63
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	651	1681	46	731	1873	33	1244	1364	327	279	675	825
Grp Volume(v), veh/h	57	0	745	21	0	758	71	0	31	69	0	0
Grp Sat Flow(s),veh/h/ln	651	0	1727	731	0	1906	1244	0	1691	1779	0	0
Q Serve(g_s), s	1.4	0.0	0.0	0.5	0.0	12.1	1.0	0.0	1.9	1.8	0.0	0.0
Cycle Q Clear(g_c), s	13.5	0.0	0.0	0.5	0.0	12.1	5.1	0.0	1.9	4.1	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.19	0.23		0.46
Lane Grp Cap(c), veh/h	537	0	1440	675	0	1589	172	0	129	160	0	0
V/C Ratio(X)	0.11	0.00	0.52	0.03	0.00	0.48	0.41	0.00	0.24	0.43	0.00	0.00
Avail Cap(c_a), veh/h	537	0	1440	675	0	1589	540	0	630	675	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)	0.82	0.00	0.82	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.9	0.0	0.0	1.6	0.0	2.5	49.2	0.0	47.9	49.1	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.1	0.1	0.0	1.0	1.6	0.0	1.0	1.8	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(95%),veh/ln	0.1	0.0	0.8	0.1	0.0	4.7	3.5	0.0	1.5	3.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.2	0.0	1.1	1.6	0.0	3.6	50.8	0.0	48.9	51.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	802			779			102			69		
Approach Delay, s/veh	1.1			3.5			50.2			51.0		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.6			13.4			96.6			13.4		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.1			14.1			7.1		
Green Ext Time (p_c), s	31.5			0.2			28.1			0.3		
Intersection Summary												
HCM 6th Ctrl Delay			7.0									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↷	↷
Traffic Volume (vph)	0	0	0	538	1	59	336	169	0	0	187	28
Future Volume (vph)	0	0	0	538	1	59	336	169	0	0	187	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1640	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.952		0.470					
Satd. Flow (perm)	0	0	0	0	1640	1442	778	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	561	61	350	176	0	0	195	29
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					20.5	20.5	28.2	28.2			15.1	15.1
Actuated g/C Ratio					0.35	0.35	0.48	0.48			0.26	0.26
v/c Ratio					0.97	0.10	0.72	0.22			0.43	0.06
Control Delay					53.8	0.3	20.9	9.5			21.2	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					53.8	0.3	20.9	9.5			21.2	0.2
LOS					D	A	C	A			C	A
Approach Delay					48.6			17.1			18.5	
Approach LOS					D			B			B	
Queue Length 50th (ft)					188	0	75	33			57	0
Queue Length 95th (ft)					#387	0	#150	64			107	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					578	614	485	847			509	571
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					0.97	0.10	0.72	0.21			0.38	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.2

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 31.6

Intersection LOS: C

Intersection Capacity Utilization 120.0%

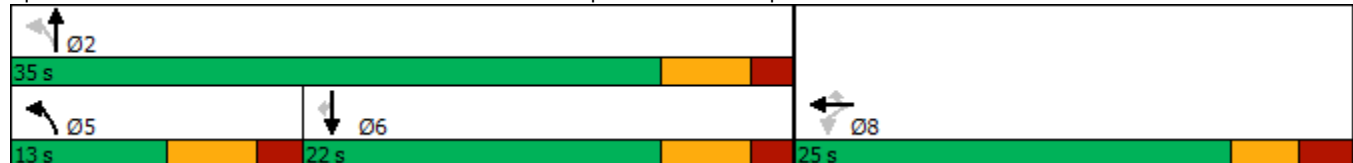
ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	538	1	59	336	169	0	0	187	28
Future Volume (veh/h)	0	0	0	538	1	59	336	169	0	0	187	28
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				560	1	0	350	176	0	0	195	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				637	1		527	804	0	0	438	
Arrive On Green				0.34	0.36	0.00	0.14	0.47	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1782	3	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				561	0	0	350	176	0	0	195	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				16.3	0.0	0.0	8.0	3.4	0.0	0.0	4.9	0.0
Cycle Q Clear(g_c), s				16.3	0.0	0.0	8.0	3.4	0.0	0.0	4.9	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				638	0		527	804	0	0	438	
V/C Ratio(X)				0.88	0.00		0.66	0.22	0.00	0.00	0.45	
Avail Cap(c_a), veh/h				663	0		527	927	0	0	572	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.1	0.0	0.0	13.1	8.6	0.0	0.0	18.0	0.0
Incr Delay (d2), s/veh				12.7	0.0	0.0	3.1	0.5	0.0	0.0	2.6	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
%ile BackOfQ(95%),veh/ln				13.0	0.0	0.0	5.3	1.9	0.0	0.0	3.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.8	0.0	0.0	16.3	9.1	0.0	0.0	20.6	0.0
LnGrp LOS				C	A		B	A	A	A	C	
Approach Vol, veh/h					561			526			195	
Approach Delay, s/veh					29.8			13.9			20.6	
Approach LOS					C			B			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	31.0			13.0			18.0			24.2		
Change Period (Y+Rc), s	6.0			6.0			6.0			5.5		
Max Green Setting (Gmax), s	29.0			7.0			16.0			19.5		
Max Q Clear Time (g_c+I1), s	5.4			10.0			6.9			18.3		
Green Ext Time (p_c), s	3.5			0.0			2.0			0.4		
Intersection Summary												
HCM 6th Ctrl Delay	21.9											
HCM 6th LOS	C											

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	349	0	0	0	0	473	533	87	640	0
Future Volume (vph)	24	0	349	0	0	0	0	473	533	87	640	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1674	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1674	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	375	0	0	0	0	1082	0	94	688	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	120.0%						ICU Level of Service H					
Analysis Period (min)	15											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2026 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	24	0	349	0	0	0	0	473	533	87	640	0
Future Vol, veh/h	24	0	349	0	0	0	0	473	533	87	640	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	26	0	375	0	0	0	0	509	573	94	688	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1385	1385	688	-	0	0	509	0	0
Stage 1	876	876	-	-	-	-	-	-	-
Stage 2	509	509	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	157	182	496	0	-	-	848	-	0
Stage 1	498	427	-	0	-	-	-	-	0
Stage 2	714	589	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	140	0	496	-	-	-	848	-	-
Mov Cap-2 Maneuver	140	0	-	-	-	-	-	-	-
Stage 1	498	0	-	-	-	-	-	-	-
Stage 2	635	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.8	0	1.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	140	496	848	-
HCM Lane V/C Ratio	-	-	0.184	0.757	0.11	-
HCM Control Delay (s)	-	-	36.4	31.5	9.8	-
HCM Lane LOS	-	-	E	D	A	-
HCM 95th %tile Q(veh)	-	-	0.6	6.5	0.4	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	13	979	1004	3
Future Volume (vph)	6	11	13	979	1004	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1799	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1799	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	1055	1071	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	71.9%			ICU Level of Service C		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2026 Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	13	979	1004	3
Future Vol, veh/h	6	11	13	979	1004	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	14	1041	1068	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2139	1070	1071	0	-	0
Stage 1	1070	-	-	-	-	-
Stage 2	1069	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	51	281	569	-	-	-
Stage 1	333	-	-	-	-	-
Stage 2	333	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	48	281	569	-	-	-
Mov Cap-2 Maneuver	48	-	-	-	-	-
Stage 1	314	-	-	-	-	-
Stage 2	333	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	46.8	0.2	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	569	-	104	-	-
HCM Lane V/C Ratio	0.024	-	0.174	-	-
HCM Control Delay (s)	11.5	0	46.8	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	24	103	11	22	33	76	820	8	19	825	181
Future Volume (vph)	153	24	103	11	22	33	76	820	8	19	825	181
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1647	0	1572	1636	0	1620	1713	0	1550	1713	0
Flt Permitted	0.719			0.672			0.109			0.189		
Satd. Flow (perm)	1226	1647	0	1112	1636	0	186	1713	0	308	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		108			35			1			31	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	133	0	12	58	0	80	871	0	20	1059	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.8	12.8		12.8	12.8		36.7	36.7		36.7	36.7	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.61	0.61		0.61	0.61	
v/c Ratio	0.62	0.31		0.05	0.15		0.71	0.83		0.11	1.00	
Control Delay	31.8	8.3		17.9	11.0		42.8	17.5		7.5	43.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.8	8.3		17.9	11.0		42.8	17.5		7.5	43.3	
LOS	C	A		B	B		D	B		A	D	
Approach Delay		21.1			12.2			19.6			42.6	
Approach LOS		C			B			B			D	
Queue Length 50th (ft)	52	7		3	7		22	279		3	~379	
Queue Length 95th (ft)	104	43		14	30		m#57	#517		12	#648	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	492		278	435		113	1049		188	1061	
Starvation Cap Reductn	0	0		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	0.53	0.27		0.04	0.13		0.71	0.83		0.11	1.00	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 30.0

Intersection LOS: C

Intersection Capacity Utilization 91.0%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2026 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	24	103	11	22	33	76	820	8	19	825	181
Future Volume (veh/h)	153	24	103	11	22	33	76	820	8	19	825	181
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	161	25	81	12	23	21	80	863	7	20	868	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	351	78	254	279	161	147	240	1188	10	283	1023	185
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.43	0.43	0.42	0.64	0.64	0.63
Sat Flow, veh/h	1436	428	1388	1205	876	800	562	1851	15	639	1595	288
Grp Volume(v), veh/h	161	0	106	12	0	44	80	0	870	20	0	1025
Grp Sat Flow(s),veh/h/ln	1436	0	1816	1205	0	1676	562	0	1866	639	0	1883
Q Serve(g_s), s	6.4	0.0	3.1	0.5	0.0	1.3	8.1	0.0	23.2	1.4	0.0	25.7
Cycle Q Clear(g_c), s	7.7	0.0	3.1	3.6	0.0	1.3	33.8	0.0	23.2	24.6	0.0	25.7
Prop In Lane	1.00		0.76	1.00		0.48	1.00		0.01	1.00		0.15
Lane Grp Cap(c), veh/h	351	0	333	279	0	307	240	0	1198	283	0	1208
V/C Ratio(X)	0.46	0.00	0.32	0.04	0.00	0.14	0.33	0.00	0.73	0.07	0.00	0.85
Avail Cap(c_a), veh/h	447	0	454	360	0	419	240	0	1198	283	0	1208
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.64	0.00	0.64	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	21.6	22.8	0.0	20.8	28.0	0.0	12.7	17.2	0.0	8.5
Incr Delay (d2), s/veh	0.9	0.0	0.5	0.1	0.0	0.2	2.4	0.0	2.5	0.5	0.0	7.5
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(95%),veh/ln	3.7	0.0	2.3	0.3	0.0	0.9	2.2	0.0	14.2	0.4	0.0	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	22.1	22.9	0.0	21.0	30.4	0.0	15.2	17.7	0.0	16.0
LnGrp LOS	C	A	C	C	A	C	C	A	B	B	A	B
Approach Vol, veh/h	267		56			950			1045			
Approach Delay, s/veh	23.7		21.4			16.5			16.1			
Approach LOS	C		C			B			B			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	44.0		16.0		44.0		16.0					
Change Period (Y+Rc), s	6.5		6.0		6.5		6.0					
Max Green Setting (Gmax), s	33.5		14.0		33.5		14.0					
Max Q Clear Time (g_c+I1), s	25.2		9.7		27.7		5.6					
Green Ext Time (p_c), s	7.4		0.4		5.5		0.1					
Intersection Summary												
HCM 6th Ctrl Delay	17.3											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	24	0	149	15	751	7	163	793	7
Future Volume (vph)	5	1	12	24	0	149	15	751	7	163	793	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1596	0	0	1670	0	0	1715	1648
Flt Permitted		0.708			0.950			0.977			0.764	
Satd. Flow (perm)	0	1232	1581	0	1527	0	0	1634	0	0	1321	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		157			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	182	0	0	814	0	0	1007	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.4	8.4		8.4			42.1			42.1	42.1
Actuated g/C Ratio		0.14	0.14		0.14			0.70			0.70	0.70
v/c Ratio		0.03	0.05		0.52			0.71			1.09	0.01
Control Delay		21.2	0.3		11.9			10.7			63.2	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		21.2	0.3		11.9			10.7			63.2	0.0
LOS		C	A		B			B			E	A
Approach Delay		6.9			11.9			10.7			62.8	
Approach LOS		A			B			B			E	
Queue Length 50th (ft)		2	0		8			125			~442	0
Queue Length 95th (ft)		10	0		54			315			m#502	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		236	347		419			1145			925	1168
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		0.03	0.04		0.43			0.71			1.09	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 36.8

Intersection LOS: D

Intersection Capacity Utilization 126.5%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

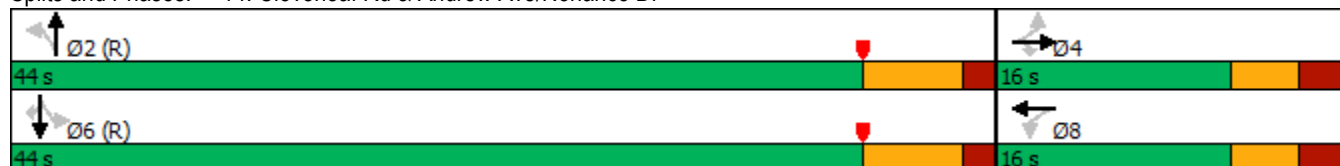
Queue shown is maximum after two cycles.

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	24	0	149	15	751	7	163	793	7
Future Volume (veh/h)	5	1	12	24	0	149	15	751	7	163	793	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	25	0	153	16	791	7	172	835	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	258	43	245	90	13	210	61	753	7	151	525	1135
Arrive On Green	0.14	0.15	0.15	0.14	0.00	0.14	0.67	0.69	0.67	1.00	1.00	1.00
Sat Flow, veh/h	956	278	1586	139	84	1362	0	1096	10	118	764	1652
Grp Volume(v), veh/h	6	0	6	178	0	0	814	0	0	1007	0	7
Grp Sat Flow(s),veh/h/ln	1234	0	1586	1584	0	0	1105	0	0	882	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	6.5	0.0	0.0	40.2	0.0	0.0	40.2	0.0	0.0
Prop In Lane	0.83		1.00	0.14		0.86	0.02		0.01	0.17		1.00
Lane Grp Cap(c), veh/h	280	0	245	287	0	0	802	0	0	661	0	1135
V/C Ratio(X)	0.02	0.00	0.02	0.62	0.00	0.00	1.01	0.00	0.00	1.52	0.00	0.01
Avail Cap(c_a), veh/h	327	0	304	345	0	0	802	0	0	661	0	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.12	0.00	0.12
Uniform Delay (d), s/veh	21.9	0.0	21.5	24.6	0.0	0.0	14.2	0.0	0.0	5.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.4	0.0	0.0	35.4	0.0	0.0	236.2	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(95%),veh/ln	0.1	0.0	0.1	4.7	0.0	0.0	22.2	0.0	0.0	65.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	21.6	27.1	0.0	0.0	49.7	0.0	0.0	241.6	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	F	A	A	F	A	A
Approach Vol, veh/h	12			178			814			1014		
Approach Delay, s/veh	21.7			27.1			49.7			240.0		
Approach LOS	C			C			D			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	46.2			13.8			46.2			13.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	42.2			2.2			42.2			8.5		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	143.1											
HCM 6th LOS	F											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	449	55	190	530	136	71	195	132	127	149	147
Future Volume (vph)	244	449	55	190	530	136	71	195	132	127	149	147
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1781	0	1558	1624	1499
Flt Permitted	0.164			0.499			0.660			0.316		
Satd. Flow (perm)	271	1809	1435	802	1731	1592	1206	1781	0	518	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		42				247
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1025			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	249	458	56	194	541	139	72	334	0	130	152	150
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	32.5	32.5	32.5	18.8	18.8	18.8	21.8	15.8		21.9	15.9	15.9
Actuated g/C Ratio	0.46	0.46	0.46	0.27	0.27	0.27	0.31	0.22		0.31	0.23	0.23
v/c Ratio	0.91	0.55	0.07	0.91	1.18	0.23	0.17	0.78		0.47	0.42	0.28
Control Delay	55.9	18.7	0.2	74.7	129.0	0.9	14.6	37.2		20.2	28.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.9	18.7	0.2	74.7	129.0	0.9	14.6	37.2		20.2	28.4	1.7
LOS	E	B	A	E	F	A	B	D		C	C	A
Approach Delay		29.5			96.6			33.2			16.7	
Approach LOS		C			F			C			B	
Queue Length 50th (ft)	76	158	0	90	~323	0	20	126		37	60	0
Queue Length 95th (ft)	#214	250	0	#216	#505	0	43	#245		72	113	5
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	274	833	747	213	460	610	434	479		281	408	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.91	0.55	0.07	0.91	1.18	0.23	0.17	0.70		0.46	0.37	0.27

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 70.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.18

Intersection Signal Delay: 51.5

Intersection LOS: D

Intersection Capacity Utilization 89.6%

ICU Level of Service E

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	244	449	55	190	530	136	71	195	132	127	149	147
Future Volume (veh/h)	244	449	55	190	530	136	71	195	132	127	149	147
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	249	458	50	194	541	0	72	199	132	130	152	68
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	293	822	697	315	464		456	250	166	317	404	357
Arrive On Green	0.11	0.45	0.45	0.52	0.52	0.00	0.06	0.20	0.19	0.10	0.25	0.25
Sat Flow, veh/h	1723	1837	1557	829	1794	1557	2069	1226	813	1576	1641	1450
Grp Volume(v), veh/h	249	458	50	194	541	0	72	0	331	130	152	68
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	829	1794	1557	2069	0	2039	1576	1641	1450
Q Serve(g_s), s	7.2	13.1	1.3	15.2	18.5	0.0	1.9	0.0	11.0	4.5	5.5	2.7
Cycle Q Clear(g_c), s	7.2	13.1	1.3	15.2	18.5	0.0	1.9	0.0	11.0	4.5	5.5	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	293	822	697	315	464		456	0	416	317	404	357
V/C Ratio(X)	0.85	0.56	0.07	0.62	1.17		0.16	0.00	0.80	0.41	0.38	0.19
Avail Cap(c_a), veh/h	293	822	697	315	464		561	0	499	329	404	357
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	14.5	11.3	16.5	17.2	0.0	20.1	0.0	27.3	19.6	22.4	21.3
Incr Delay (d2), s/veh	20.2	0.5	0.0	2.6	95.6	0.0	0.2	0.0	7.4	0.9	0.6	0.3
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(95%),veh/ln	7.3	8.2	0.7	3.4	25.0	0.0	1.6	0.0	10.1	2.8	3.6	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.1	15.0	11.3	19.1	112.8	0.0	20.2	0.0	34.7	20.4	22.9	21.6
LnGrp LOS	D	B	B	B	F		C	A	C	C	C	C
Approach Vol, veh/h	757			735			403			350		
Approach Delay, s/veh	22.4			88.1			32.1			21.7		
Approach LOS	C			F			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	24.0	13.4	20.6		37.5	10.4	23.6				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	9.7	21.0	7.0	13.0		15.6	4.4	8.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5		0.1	0.0	0.6				

Intersection Summary

HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

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

Lanes, Volumes, Timings
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	328	0	449	84	355	421	0
Future Volume (vph)	0	0	0	0	0	328	0	449	84	355	421	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1844	1567	1787	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1844	1567	1787	1863	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	364	0	499	93	394	468	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	52.5%					ICU Level of Service A						
Analysis Period (min)	15											

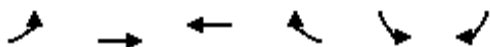
HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2026 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↖	↗	↖	↗	
Traffic Vol, veh/h	0	0	0	0	0	328	0	449	84	355	421	0
Future Vol, veh/h	0	0	0	0	0	328	0	449	84	355	421	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	0	0	0	364	0	499	93	394	468	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	468	-	-	499	468	0	0	592	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	595	0	0	603	1094	-	-	801	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	595	-	-	603	1094	-	-	801	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		19.7		0		6.3					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1094	-	-	-	603	801	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.604	0.492	-	-				
HCM Control Delay (s)	0	-	-	0	19.7	13.8	-	-				
HCM Lane LOS	A	-	-	A	C	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	4	2.8	-	-				

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

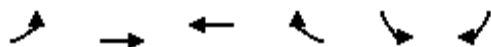
2026 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	324	384	470	153	185	433
Future Volume (vph)	324	384	470	153	185	433
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1782	1500	1676	1500
Flt Permitted	0.257				0.950	
Satd. Flow (perm)	454	1782	1782	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				170		197
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	360	427	522	170	206	481
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	20.0	55.0	35.0	35.0	20.0	20.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	C-Max	C-Max	None	None
Act Effect Green (s)	51.3	51.3	32.9	32.9	13.7	32.1
Actuated g/C Ratio	0.68	0.68	0.44	0.44	0.18	0.43
v/c Ratio	0.68	0.35	0.67	0.23	0.68	0.64
Control Delay	13.2	6.2	23.1	3.5	40.1	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	6.2	23.1	3.5	40.1	13.3
LOS	B	A	C	A	D	B
Approach Delay		9.4	18.3		21.3	
Approach LOS		A	B		C	
Queue Length 50th (ft)	61	74	200	0	88	87
Queue Length 95th (ft)	121	118	315	34	156	180
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	555	1220	782	754	335	782

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2026 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.65	0.35	0.67	0.23	0.61	0.62

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 16.0

Intersection LOS: B

Intersection Capacity Utilization 68.4%

ICU Level of Service C

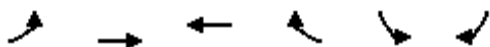
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2026 Build
SAT Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	324	384	470	153	185	433
Future Volume (veh/h)	324	384	470	153	185	433
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	1772	1786	1786	1772	1772	1772
Adj Flow Rate, veh/h	360	427	522	170	206	481
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	1	2	2	2
Cap, veh/h	507	1191	806	678	338	524
Arrive On Green	0.15	0.67	0.45	0.45	0.20	0.20
Sat Flow, veh/h	1688	1786	1786	1502	1688	1502
Grp Volume(v), veh/h	360	427	522	170	206	481
Grp Sat Flow(s),veh/h/ln	1688	1786	1786	1502	1688	1502
Q Serve(g_s), s	7.6	7.9	17.0	5.3	8.3	15.0
Cycle Q Clear(g_c), s	7.6	7.9	17.0	5.3	8.3	15.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	507	1191	806	678	338	524
V/C Ratio(X)	0.71	0.36	0.65	0.25	0.61	0.92
Avail Cap(c_a), veh/h	594	1191	806	678	338	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	5.5	15.9	12.7	27.3	23.4
Incr Delay (d2), s/veh	3.3	0.8	4.0	0.9	3.2	21.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.3	3.9	10.9	3.0	6.5	16.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.7	6.3	19.9	13.6	30.5	44.8
LnGrp LOS	B	A	B	B	C	D
Approach Vol, veh/h		787	692		687	
Approach Delay, s/veh		10.2	18.4		40.5	
Approach LOS		B	B		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	16.1	38.9			55.0	20.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	14.0	29.0			49.0	14.0
Max Q Clear Time (g_c+I1), s	9.6	19.0			9.9	17.0
Green Ext Time (p_c), s	0.6	2.0			1.6	0.0

Intersection Summary

HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2026 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	49	33	15	33	77	19	275	7	53	271	52
Future Volume (vph)	57	49	33	15	33	77	19	275	7	53	271	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1673	0	0	1612	0	0	1778	0	0	1848	0
Flt Permitted		0.980			0.994			0.997			0.993	
Satd. Flow (perm)	0	1673	0	0	1612	0	0	1778	0	0	1848	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	144	0	0	130	0	0	313	0	0	391	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	55.8%											
Analysis Period (min)	15											
	ICU Level of Service B											

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

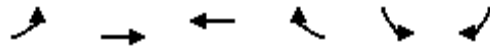
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	57	49	33	15	33	77	19	275	7	53	271	52
Future Vol, veh/h	57	49	33	15	33	77	19	275	7	53	271	52
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	59	51	34	16	34	80	20	286	7	55	282	54
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.1	10.2	13.1	14.6
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	41%	12%	14%
Vol Thru, %	91%	35%	26%	72%
Vol Right, %	2%	24%	62%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	301	139	125	376
LT Vol	19	57	15	53
Through Vol	275	49	33	271
RT Vol	7	33	77	52
Lane Flow Rate	314	145	130	392
Geometry Grp	1	1	1	1
Degree of Util (X)	0.469	0.244	0.206	0.56
Departure Headway (Hd)	5.387	6.067	5.694	5.151
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	668	589	628	697
Service Time	3.435	4.129	3.757	3.197
HCM Lane V/C Ratio	0.47	0.246	0.207	0.562
HCM Control Delay	13.1	11.1	10.2	14.6
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	2.5	1	0.8	3.5

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2026 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	529	574	84	78	3
Future Volume (vph)	3	529	574	84	78	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1781	0	1666	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1754	1828	1781	0	1666	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	551	686	0	84	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 46.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	529	574	84	78	3
Future Vol, veh/h	3	529	574	84	78	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	551	598	88	81	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	686	0	-	0	1199	642
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	557	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	721	-	-	-	197	483
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	721	-	-	-	196	483
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	611	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		18.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	721	-	-	-	357	
HCM Lane V/C Ratio	0.004	-	-	-	0.236	
HCM Control Delay (s)	10	-	-	-	18.2	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.9	

Lanes, Volumes, Timings
34: Ridge Run Rd & Site Driveway

2026 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	46	50	37	35	0
Future Volume (vph)	0	46	50	37	35	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1730	1747	0
Flt Permitted				0.972		
Satd. Flow (perm)	1611	0	0	1730	1747	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			1310	976	
Travel Time (s)	15.6			25.5	19.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	51	0	0	97	39	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
34: Ridge Run Rd & Site Driveway

2026 Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	46	50	37	35	0
Future Vol, veh/h	0	46	50	37	35	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	2
Mvmt Flow	0	51	56	41	39	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	192	39	39	0	-	0
Stage 1	39	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Critical Hdwy	6.42	6.22	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	922	1104	1172	-	-	-
Stage 1	1150	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	877	1104	1172	-	-	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	1094	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	4.7		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1172	-	1104	-	-	
HCM Lane V/C Ratio	0.047	-	0.046	-	-	
HCM Control Delay (s)	8.2	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

APPENDIX L10

2026 BUILD WITH IMPROVEMENTS CONDITION ANALYSES

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	449	55	190	530	136	71	195	132	127	149	147
Future Volume (vph)	244	449	55	190	530	136	71	195	132	127	149	147
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1781	0	1558	1624	1499
Flt Permitted	0.130			0.499			0.660			0.265		
Satd. Flow (perm)	215	1809	1435	802	1731	1592	1206	1781	0	434	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239			38			232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	249	458	56	194	541	139	72	334	0	130	152	150
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	14.0		14.0	14.0	14.0
Total Split (s)	13.5	45.0	45.0	31.5	31.5	31.5	14.0	21.0		14.0	21.0	21.0
Total Split (%)	16.9%	56.3%	56.3%	39.4%	39.4%	39.4%	17.5%	26.3%		17.5%	26.3%	26.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	38.8	38.8	38.8	25.1	25.1	25.1	21.0	15.0		21.2	15.1	15.1
Actuated g/C Ratio	0.51	0.51	0.51	0.33	0.33	0.33	0.28	0.20		0.28	0.20	0.20
v/c Ratio	0.98	0.50	0.07	0.73	0.95	0.20	0.19	0.88		0.55	0.47	0.31
Control Delay	74.1	15.5	0.2	43.1	54.8	0.7	18.6	53.6		27.7	34.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	74.1	15.5	0.2	43.1	54.8	0.7	18.6	53.6		27.7	34.5	2.5
LOS	E	B	A	D	D	A	B	D		C	C	A
Approach Delay		33.5			43.6			47.4			21.3	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	~88	147	0	85	262	0	24	147		44	69	0
Queue Length 95th (ft)	#231	229	0	#193	#461	1	51	#303		84	126	10
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	253	950	825	277	598	706	390	385		240	325	485
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.98	0.48	0.07	0.70	0.90	0.20	0.18	0.87		0.54	0.47	0.31

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 76.1

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 37.2

Intersection LOS: D

Intersection Capacity Utilization 89.6%

ICU Level of Service E

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	31.5 s	14 s	21 s
 Ø6	 Ø7	 Ø8	
45 s	14 s	21 s	

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2026 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	244	449	55	190	530	136	71	195	132	127	149	147
Future Volume (veh/h)	244	449	55	190	530	136	71	195	132	127	149	147
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	249	458	50	194	541	0	72	199	132	130	152	68
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	302	899	762	355	573		419	232	154	285	378	334
Arrive On Green	0.10	0.49	0.49	0.64	0.64	0.00	0.06	0.19	0.18	0.10	0.23	0.23
Sat Flow, veh/h	1723	1837	1557	829	1794	1557	2069	1226	813	1576	1641	1450
Grp Volume(v), veh/h	249	458	50	194	541	0	72	0	331	130	152	68
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	829	1794	1557	2069	0	2039	1576	1641	1450
Q Serve(g_s), s	7.3	13.4	1.3	12.6	21.8	0.0	2.1	0.0	12.5	5.1	6.2	3.0
Cycle Q Clear(g_c), s	7.3	13.4	1.3	12.6	21.8	0.0	2.1	0.0	12.5	5.1	6.2	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	302	899	762	355	573		419	0	386	285	378	334
V/C Ratio(X)	0.82	0.51	0.07	0.55	0.94		0.17	0.00	0.86	0.46	0.40	0.20
Avail Cap(c_a), veh/h	302	915	775	362	588		504	0	386	285	378	334
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.6	13.8	10.7	12.0	13.7	0.0	23.3	0.0	31.3	22.8	25.9	24.6
Incr Delay (d2), s/veh	16.8	0.2	0.0	0.9	23.5	0.0	0.2	0.0	17.3	1.1	0.7	0.3
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(95%),veh/ln	7.0	8.3	0.7	2.6	12.2	0.0	1.9	0.0	12.5	3.3	4.2	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	13.9	10.7	12.9	37.2	0.0	23.4	0.0	48.6	24.0	26.6	24.9
LnGrp LOS	D	B	B	B	D		C	A	D	C	C	C
Approach Vol, veh/h	757				735				403			
Approach Delay, s/veh	20.8				30.8				44.1			
Approach LOS	C				C				D			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	30.8	14.0	21.0		44.3	10.7	24.3				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	25.0	7.0	14.0		38.5	7.0	14.0				
Max Q Clear Time (g_c+I1), s	9.8	24.3	7.6	14.5		15.9	4.6	8.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0		0.1	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	23	34	6	43	120	46	334	9	32	188	77
Future Volume (vph)	68	23	34	6	43	120	46	334	9	32	188	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1235	0	0	1456	0	0	1577	0	0	1434	0
Flt Permitted		0.807			0.985			0.932			0.934	
Satd. Flow (perm)	0	1024	0	0	1437	0	0	1479	0	0	1346	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		31			125			3			47	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	130	0	0	176	0	0	405	0	0	309	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	22.0	22.0		22.0	22.0		38.0	38.0		38.0	38.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		10.7			10.7			22.4			22.4	
Actuated g/C Ratio		0.27			0.27			0.57			0.57	
v/c Ratio		0.43			0.36			0.48			0.39	
Control Delay		15.5			7.7			10.2			8.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.5			7.7			10.2			8.1	
LOS		B			A			B			A	
Approach Delay		15.5			7.7			10.2			8.1	
Approach LOS		B			A			B			A	
Queue Length 50th (ft)		15			7			54			32	
Queue Length 95th (ft)		65			50			148			98	
Internal Link Dist (ft)		1077			1324			919			946	
Turn Bay Length (ft)												
Base Capacity (vph)		487			728			1264			1156	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.27			0.24			0.32			0.27	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 39.1

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 9.8

Intersection LOS: A

Intersection Capacity Utilization 60.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
38 s	22 s
 Ø6	 Ø8
38 s	22 s

HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	68	23	34	6	43	120	46	334	9	32	188	77
Future Volume (veh/h)	68	23	34	6	43	120	46	334	9	32	188	77
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	71	24	35	6	45	125	48	348	9	33	196	80
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	374	89	91	151	90	237	198	573	14	190	445	167
Arrive On Green	0.18	0.22	0.18	0.18	0.22	0.18	0.35	0.39	0.35	0.35	0.39	0.35
Sat Flow, veh/h	722	410	417	28	415	1087	106	1461	36	88	1133	426
Grp Volume(v), veh/h	130	0	0	176	0	0	405	0	0	309	0	0
Grp Sat Flow(s),veh/h/ln	1549	0	0	1531	0	0	1602	0	0	1647	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.6	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	0.0	2.7	0.0	0.0	5.3	0.0	0.0	3.6	0.0	0.0
Prop In Lane	0.55		0.27	0.03		0.71	0.12		0.02	0.11		0.26
Lane Grp Cap(c), veh/h	494	0	0	419	0	0	723	0	0	737	0	0
V/C Ratio(X)	0.26	0.00	0.00	0.42	0.00	0.00	0.56	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	1079	0	0	1096	0	0	2107	0	0	2134	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.9	0.0	0.0	9.2	0.0	0.0	6.4	0.0	0.0	6.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.0	0.0	0.7	0.0	0.0	0.4	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	0.4	0.0	0.0	0.6	0.0	0.0	1.2	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	0.0	0.0	9.9	0.0	0.0	7.1	0.0	0.0	6.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		130			176			405			309	
Approach Delay, s/veh		9.2			9.9			7.1			6.3	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.1		10.6		15.1		10.6				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		32.0		16.0		32.0		16.0				
Max Q Clear Time (g_c+I1), s		7.3		3.7		5.6		4.7				
Green Ext Time (p_c), s		1.7		0.3		1.4		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				7.6								
HCM 6th LOS				A								

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	82	77	4	51	75	33	326	6	106	385	61
Future Volume (vph)	91	82	77	4	51	75	33	326	6	106	385	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1309	0	0	1480	0	0	1585	0	0	1487	0
Flt Permitted		0.849			0.989			0.927			0.854	
Satd. Flow (perm)	0	1132	0	0	1465	0	0	1475	0	0	1281	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		28			78			2			14	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	260	0	0	135	0	0	380	0	0	575	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	22.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	
Total Split (s)	28.0	28.0		28.0	28.0		52.0	52.0		52.0	52.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		18.9			18.9			35.7			35.7	
Actuated g/C Ratio		0.29			0.29			0.55			0.55	
v/c Ratio		0.75			0.28			0.47			0.81	
Control Delay		36.2			12.2			11.4			22.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		36.2			12.2			11.4			22.9	
LOS		D			B			B			C	
Approach Delay		36.2			12.2			11.4			22.9	
Approach LOS		D			B			B			C	
Queue Length 50th (ft)		85			17			91			181	
Queue Length 95th (ft)		#224			63			157			339	
Internal Link Dist (ft)		1066			1154			917			948	
Turn Bay Length (ft)												
Base Capacity (vph)		439			594			1104			962	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.59			0.23			0.34			0.60	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 65.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 21.2

Intersection LOS: C

Intersection Capacity Utilization 90.5%

ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave



HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	82	77	4	51	75	33	326	6	106	385	61
Future Volume (veh/h)	91	82	77	4	51	75	33	326	6	106	385	61
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	95	85	80	4	53	78	34	340	6	110	401	64
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	247	157	119	106	166	232	140	720	12	218	563	83
Arrive On Green	0.23	0.26	0.23	0.23	0.26	0.23	0.44	0.47	0.44	0.44	0.47	0.44
Sat Flow, veh/h	436	613	466	16	647	908	68	1539	26	214	1203	177
Grp Volume(v), veh/h	260	0	0	135	0	0	380	0	0	575	0	0
Grp Sat Flow(s),veh/h/ln	1516	0	0	1571	0	0	1633	0	0	1594	0	0
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0
Cycle Q Clear(g_c), s	5.6	0.0	0.0	2.6	0.0	0.0	5.8	0.0	0.0	10.9	0.0	0.0
Prop In Lane	0.37		0.31	0.03		0.58	0.09		0.02	0.19		0.11
Lane Grp Cap(c), veh/h	482	0	0	461	0	0	827	0	0	820	0	0
V/C Ratio(X)	0.54	0.00	0.00	0.29	0.00	0.00	0.46	0.00	0.00	0.70	0.00	0.00
Avail Cap(c_a), veh/h	1024	0	0	1048	0	0	2101	0	0	2070	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.3	0.0	0.0	11.2	0.0	0.0	6.7	0.0	0.0	8.0	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	1.1	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(95%),veh/ln	2.9	0.0	0.0	1.3	0.0	0.0	2.8	0.0	0.0	5.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.3	0.0	0.0	11.6	0.0	0.0	7.1	0.0	0.0	9.1	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h	260			135			380			575		
Approach Delay, s/veh	13.3			11.6			7.1			9.1		
Approach LOS	B			B			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	22.0			14.3			22.0			14.3		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	46.0			22.0			46.0			22.0		
Max Q Clear Time (g_c+I1), s	7.8			7.6			12.9			4.6		
Green Ext Time (p_c), s	1.7			0.8			3.1			0.4		
Intersection Summary												
HCM 6th Ctrl Delay	9.6											
HCM 6th LOS	A											

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	49	33	15	33	77	19	275	7	53	271	52
Future Volume (vph)	57	49	33	15	33	77	19	275	7	53	271	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1585	0	0	1527	0	0	1685	0	0	1750	0
Flt Permitted		0.808			0.937			0.964			0.916	
Satd. Flow (perm)	0	1306	0	0	1439	0	0	1629	0	0	1615	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			80			2			17	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	144	0	0	130	0	0	313	0	0	391	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	28.0	28.0		28.0	28.0		47.0	47.0		47.0	47.0	
Total Split (%)	37.3%	37.3%		37.3%	37.3%		62.7%	62.7%		62.7%	62.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		10.2			10.1			20.6			20.6	
Actuated g/C Ratio		0.28			0.28			0.56			0.56	
v/c Ratio		0.38			0.29			0.34			0.43	
Control Delay		13.7			7.7			8.3			8.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.7			7.7			8.3			8.9	
LOS		B			A			A			A	
Approach Delay		13.7			7.7			8.3			8.9	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		18			7			37			46	
Queue Length 95th (ft)		64			41			97			122	
Internal Link Dist (ft)		930			1052			920			945	
Turn Bay Length (ft)												
Base Capacity (vph)		902			1012			1581			1568	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.16			0.13			0.20			0.25	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 36.7

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 9.3

Intersection LOS: A

Intersection Capacity Utilization 59.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 29: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
47 s	28 s
 Ø6	 Ø8
47 s	28 s

HCM 6th Signalized Intersection Summary
29: Colebrook Rd & Harrisburg Ave

2026 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	49	33	15	33	77	19	275	7	53	271	52
Future Volume (veh/h)	57	49	33	15	33	77	19	275	7	53	271	52
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	1724	1780	1837	1837	1795	1837	1724	1766	1794	1986	1958	1858
Adj Flow Rate, veh/h	59	51	34	16	34	80	20	286	7	55	282	54
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	8	4	0	0	3	0	5	2	0	0	2	9
Cap, veh/h	336	116	72	203	92	194	183	614	14	234	530	94
Arrive On Green	0.15	0.19	0.15	0.15	0.19	0.15	0.33	0.38	0.33	0.33	0.38	0.33
Sat Flow, veh/h	608	600	373	151	474	1000	50	1631	38	152	1409	250
Grp Volume(v), veh/h	144	0	0	130	0	0	313	0	0	391	0	0
Grp Sat Flow(s),veh/h/ln	1582	0	0	1625	0	0	1720	0	0	1811	0	0
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	1.6	0.0	0.0	3.2	0.0	0.0	4.0	0.0	0.0
Prop In Lane	0.41		0.24	0.12		0.62	0.06		0.02	0.14		0.14
Lane Grp Cap(c), veh/h	457	0	0	419	0	0	738	0	0	781	0	0
V/C Ratio(X)	0.32	0.00	0.00	0.31	0.00	0.00	0.42	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	1604	0	0	1644	0	0	3129	0	0	3261	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.6	0.0	0.0	8.6	0.0	0.0	5.6	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.5	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(95%),veh/ln	0.8	0.0	0.0	0.7	0.0	0.0	1.3	0.0	0.0	1.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.0	0.0	0.0	9.0	0.0	0.0	6.0	0.0	0.0	6.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	144			130			313			391		
Approach Delay, s/veh	9.0			9.0			6.0			6.4		
Approach LOS	A			A			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	13.8			9.5			13.8			9.5		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	41.0			22.0			41.0			22.0		
Max Q Clear Time (g_c+I1), s	5.2			3.8			6.0			3.6		
Green Ext Time (p_c), s	1.3			0.4			1.8			0.4		
Intersection Summary												
HCM 6th Ctrl Delay	7.0											
HCM 6th LOS	A											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	340	19	103	8	12	75	42	846	8	10	617	150
Future Volume (vph)	340	19	103	8	12	75	42	846	8	10	617	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1568	0	1391	1563	0	1500	1616	0	1628	1613	1486
Flt Permitted	0.695			0.671			0.268			0.101		
Satd. Flow (perm)	1173	1568	0	981	1563	0	423	1616	0	173	1613	1486
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		114			83			1				167
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	378	135	0	9	96	0	47	949	0	11	686	167
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	64.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	39.5
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	0.56
v/c Ratio	1.13	0.26		0.03	0.19		0.20	1.04		0.11	0.75	0.18
Control Delay	116.5	7.2		18.6	7.4		8.3	54.2		10.5	18.3	1.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	116.5	7.2		18.6	7.4		8.3	54.2		10.5	18.3	1.9
LOS	F	A		B	A		A	D		B	B	A
Approach Delay		87.7			8.3			52.1			15.1	
Approach LOS		F			A			D			B	
Queue Length 50th (ft)	~193	7		3	4		6	~454		2	203	0
Queue Length 95th (ft)	#347	44		13	35		m12	#663		10	344	22

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	335	529		280	505		238	912		97	910	911
Starvation Cap Reductn	0	0		0	0		0	0		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	1.13	0.26		0.03	0.19		0.20	1.04		0.11	0.75	0.18

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 44.7

Intersection LOS: D

Intersection Capacity Utilization 82.8%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

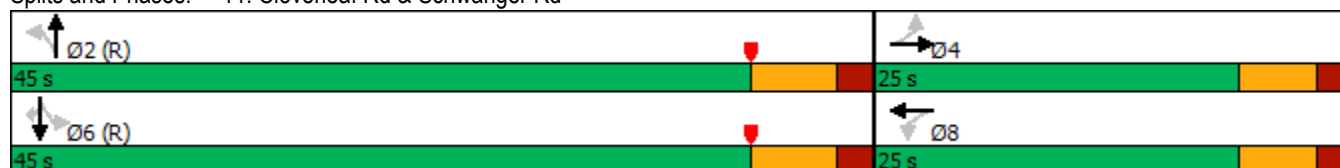
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	19	103	8	12	75	42	846	8	10	617	150
Future Volume (veh/h)	340	19	103	8	12	75	42	846	8	10	617	150
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	378	21	114	9	13	83	47	940	9	11	686	167
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	422	80	432	341	57	363	288	995	10	450	1020	898
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.56
Sat Flow, veh/h	1359	278	1512	1050	199	1272	622	1764	17	616	1807	1591
Grp Volume(v), veh/h	378	0	135	9	0	96	47	0	949	11	686	167
Grp Sat Flow(s),veh/h/ln	1359	0	1790	1050	0	1471	622	0	1781	616	1807	1591
Q Serve(g_s), s	16.5	0.0	4.1	0.5	0.0	3.5	2.9	0.0	0.0	0.6	18.7	3.6
Cycle Q Clear(g_c), s	20.0	0.0	4.1	4.6	0.0	3.5	21.6	0.0	0.0	0.6	18.7	3.6
Prop In Lane	1.00		0.84	1.00		0.86	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	422	0	512	341	0	420	288	0	1005	450	1020	898
V/C Ratio(X)	0.90	0.00	0.26	0.03	0.00	0.23	0.16	0.00	0.94	0.02	0.67	0.19
Avail Cap(c_a), veh/h	422	0	512	341	0	420	288	0	1005	450	1020	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.69	0.00	0.69	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	19.7	21.1	0.0	19.5	5.1	0.0	0.0	6.8	10.7	7.4
Incr Delay (d2), s/veh	21.0	0.0	0.3	0.0	0.0	0.3	0.8	0.0	13.6	0.1	3.5	0.5
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	8.6	0.0	1.6	0.1	0.0	1.2	0.2	0.0	3.8	0.1	6.7	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.1	0.0	19.9	21.1	0.0	19.7	5.9	0.0	13.6	6.9	14.3	7.9
LnGrp LOS	D	A	B	C	A	B	A	A	B	A	B	A
Approach Vol, veh/h	513			105			996			864		
Approach Delay, s/veh	41.4			19.8			13.2			12.9		
Approach LOS	D			B			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			20.7			6.6		
Green Ext Time (p_c), s	30.2			0.0			13.7			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	19.2											
HCM 6th LOS	B											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	34	111	9	41	36	94	844	13	49	1083	322
Future Volume (vph)	220	34	111	9	41	36	94	844	13	49	1083	322
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1662	0	1416	1704	0	1620	1696	0	1628	1740	1545
Flt Permitted	0.704			0.660			0.104			0.192		
Satd. Flow (perm)	1200	1662	0	984	1704	0	177	1696	0	329	1740	1545
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		104			38			3				339
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	232	153	0	9	81	0	99	902	0	52	1140	339
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	16.0	16.0		16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%		26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)	11.0	11.0		11.0	11.0		38.5	38.5		38.5	38.5	37.5
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.64	0.64		0.64	0.64	0.62
v/c Ratio	1.05	0.39		0.05	0.24		0.88	0.83		0.25	1.02	0.31
Control Delay	105.9	12.1		21.1	15.1		64.6	18.5		8.2	46.8	1.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	105.9	12.1		21.1	15.1		64.6	18.5		8.2	46.8	1.5
LOS	F	B		C	B		E	B		A	D	A
Approach Delay		68.6			15.7			23.1			35.5	
Approach LOS		E			B			C			D	
Queue Length 50th (ft)	~95	15		3	13		44	393		7	~379	0
Queue Length 95th (ft)	#213	59		13	45		m#109	391		23	#665	23
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	220	389		180	343		113	1089		211	1116	1092
Starvation Cap Reductn	0	0		0	0		0	0		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	1.05	0.39		0.05	0.24		0.88	0.83		0.25	1.02	0.31

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 35.0

Intersection LOS: C

Intersection Capacity Utilization 103.0%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	34	111	9	41	36	94	844	13	49	1083	322
Future Volume (veh/h)	220	34	111	9	41	36	94	844	13	49	1083	322
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	232	36	93	9	43	24	99	888	13	52	1140	328
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	331	94	242	250	201	112	164	1170	17	268	1232	1025
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.43	0.43	0.42	0.64	0.64	0.63
Sat Flow, veh/h	1407	510	1318	1076	1097	612	369	1823	27	644	1921	1640
Grp Volume(v), veh/h	232	0	129	9	0	67	99	0	901	52	1140	328
Grp Sat Flow(s),veh/h/ln	1407	0	1828	1076	0	1710	369	0	1850	644	1921	1640
Q Serve(g_s), s	9.0	0.0	3.8	0.4	0.0	2.0	7.1	0.0	24.7	4.1	31.4	5.6
Cycle Q Clear(g_c), s	11.0	0.0	3.8	4.2	0.0	2.0	38.5	0.0	24.7	28.8	31.4	5.6
Prop In Lane	1.00		0.72	1.00		0.36	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	331	0	335	250	0	313	164	0	1187	268	1232	1025
V/C Ratio(X)	0.70	0.00	0.38	0.04	0.00	0.21	0.60	0.00	0.76	0.19	0.93	0.32
Avail Cap(c_a), veh/h	331	0	335	250	0	313	164	0	1187	268	1232	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.61	0.00	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	0.0	21.9	23.4	0.0	21.0	34.8	0.0	13.2	19.4	9.5	5.3
Incr Delay (d2), s/veh	6.5	0.0	0.7	0.1	0.0	0.3	9.7	0.0	2.8	1.6	13.0	0.8
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(95%),veh/ln	6.6	0.0	2.8	0.2	0.0	1.4	3.4	0.0	14.8	1.2	17.4	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.4	0.0	22.6	23.4	0.0	21.3	44.5	0.0	16.0	21.0	22.5	6.1
LnGrp LOS	C	A	C	C	A	C	D	A	B	C	C	A
Approach Vol, veh/h	361			76			1000			1520		
Approach Delay, s/veh	28.9			21.6			18.8			18.9		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.0			16.0			44.0			16.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	37.5			10.0			37.5			10.0		
Max Q Clear Time (g_c+I1), s	26.7			13.0			33.4			6.2		
Green Ext Time (p_c), s	9.6			0.0			4.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	20.2											
HCM 6th LOS	C											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	24	103	11	22	33	76	820	8	19	825	181
Future Volume (vph)	153	24	103	11	22	33	76	820	8	19	825	181
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1647	0	1572	1636	0	1620	1713	0	1550	1757	1561
Flt Permitted	0.719			0.672			0.190			0.189		
Satd. Flow (perm)	1226	1647	0	1112	1636	0	324	1713	0	308	1757	1561
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		108			35			1				191
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	133	0	12	58	0	80	871	0	20	868	191
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)	12.8	12.8		12.8	12.8		36.7	36.7		36.7	36.7	36.7
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.61	0.61		0.61	0.61	0.61
v/c Ratio	0.62	0.31		0.05	0.15		0.40	0.83		0.11	0.81	0.19
Control Delay	31.8	8.3		17.9	11.0		12.0	17.9		7.5	18.1	1.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	31.8	8.3		17.9	11.0		12.0	17.9		7.5	18.1	1.6
LOS	C	A		B	B		B	B		A	B	A
Approach Delay		21.1			12.2			17.4			15.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)	52	7		3	7		16	279		3	221	0
Queue Length 95th (ft)	104	43		14	30		m23	#518		12	#478	21
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	306	492		278	435		198	1049		188	1075	1029
Starvation Cap Reductn	0	0		0	0		0	0		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	0.53	0.27		0.04	0.13		0.40	0.83		0.11	0.81	0.19

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 16.6

Intersection LOS: B

Intersection Capacity Utilization 85.0%

ICU Level of Service E

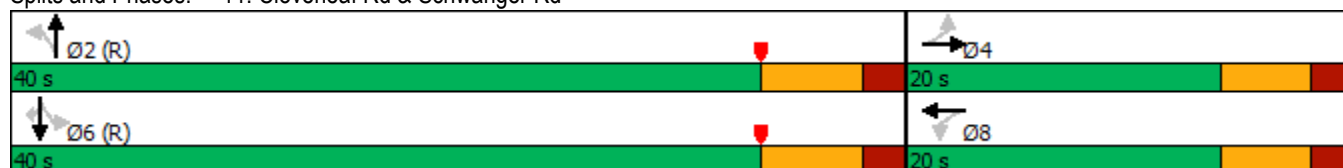
Analysis Period (min) 15

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2026 Build w/ Improvements

SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	24	103	11	22	33	76	820	8	19	825	181
Future Volume (veh/h)	153	24	103	11	22	33	76	820	8	19	825	181
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	161	25	81	12	23	21	80	863	7	20	868	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	351	78	254	279	161	147	317	1188	10	283	1242	1060
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.43	0.43	0.42	0.64	0.64	0.64
Sat Flow, veh/h	1436	428	1388	1205	876	800	562	1851	15	639	1935	1652
Grp Volume(v), veh/h	161	0	106	12	0	44	80	0	870	20	868	157
Grp Sat Flow(s),veh/h/ln	1436	0	1816	1205	0	1676	562	0	1866	639	1935	1652
Q Serve(g_s), s	6.4	0.0	3.1	0.5	0.0	1.3	7.2	0.0	23.2	1.4	17.5	2.3
Cycle Q Clear(g_c), s	7.7	0.0	3.1	3.6	0.0	1.3	24.7	0.0	23.2	24.6	17.5	2.3
Prop In Lane	1.00		0.76	1.00		0.48	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	351	0	333	279	0	307	317	0	1198	283	1242	1060
V/C Ratio(X)	0.46	0.00	0.32	0.04	0.00	0.14	0.25	0.00	0.73	0.07	0.70	0.15
Avail Cap(c_a), veh/h	447	0	454	360	0	419	317	0	1198	283	1242	1060
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.68	0.00	0.68	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	21.6	22.8	0.0	20.8	20.6	0.0	12.7	17.2	7.0	4.3
Incr Delay (d2), s/veh	0.9	0.0	0.5	0.1	0.0	0.2	1.3	0.0	2.7	0.5	3.3	0.3
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(95%),veh/ln	3.7	0.0	2.3	0.3	0.0	0.9	1.9	0.0	14.4	0.4	9.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	22.1	22.9	0.0	21.0	21.9	0.0	15.4	17.7	10.3	4.5
LnGrp LOS	C	A	C	C	A	C	C	A	B	B	B	A
Approach Vol, veh/h	267		56				950				1045	
Approach Delay, s/veh	23.7		21.4				15.9				9.6	
Approach LOS	C		C				B				A	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	44.0		16.0		44.0		16.0					
Change Period (Y+Rc), s	6.5		6.0		6.5		6.0					
Max Green Setting (Gmax), s	33.5		14.0		33.5		14.0					
Max Q Clear Time (g_c+I1), s	25.2		9.7		19.5		5.6					
Green Ext Time (p_c), s	7.4		0.4		12.5		0.1					
Intersection Summary												
HCM 6th Ctrl Delay	14.1											
HCM 6th LOS	B											

Lanes, Volumes, Timings

2026 Build w/ Improvements

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	702	0	123	375	186	0	0	266	47
Future Volume (vph)	0	0	0	702	0	123	375	186	0	0	266	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.257					
Satd. Flow (perm)	0	0	0	0	1653	1414	430	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						140						132
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	739	129	395	196	0	0	280	49
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	7.0			7.0	7.0
Minimum Split (s)				12.5	12.5	12.5	13.0	13.0			13.0	13.0
Total Split (s)				34.5	34.5	34.5	17.0	35.5			18.5	18.5
Total Split (%)				49.3%	49.3%	49.3%	24.3%	50.7%			26.4%	26.4%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					30.0	30.0	30.5	30.5			13.5	13.5
Actuated g/C Ratio					0.43	0.43	0.44	0.44			0.19	0.19
v/c Ratio					1.04	0.19	1.02	0.30			0.88	0.12
Control Delay					68.8	3.0	72.5	14.4			57.7	0.6
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					68.8	3.0	72.5	14.4			57.7	0.6
LOS					E	A	E	B			E	A
Approach Delay					59.0			53.2			49.2	
Approach LOS					E			D			D	
Queue Length 50th (ft)					~353	0	~128	52			118	0
Queue Length 95th (ft)					#550	25	#292	97			#247	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2026 Build w/ Improvements

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					708	686	386	658			319	422
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					1.04	0.19	1.02	0.30			0.88	0.12

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 55.3

Intersection LOS: E

Intersection Capacity Utilization 154.3%

ICU Level of Service H

Analysis Period (min) 15

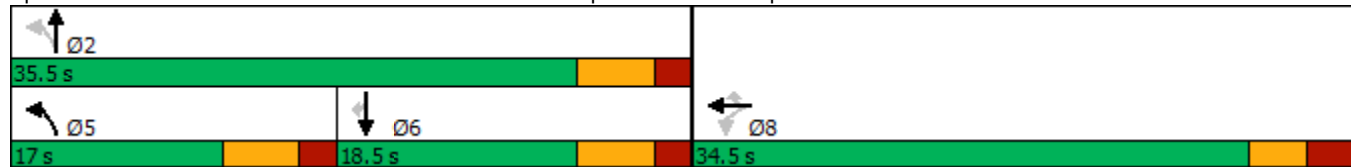
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2026 Build w/ Improvements

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	702	0	123	375	186	0	0	266	47
Future Volume (veh/h)	0	0	0	702	0	123	375	186	0	0	266	47
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				739	0	0	395	196	0	0	280	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				765	0		430	689	0	0	345	
Arrive On Green				0.41	0.00	0.00	0.17	0.44	0.00	0.00	0.19	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				739	0	0	395	196	0	0	280	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				28.3	0.0	0.0	12.0	5.6	0.0	0.0	10.5	0.0
Cycle Q Clear(g_c), s				28.3	0.0	0.0	12.0	5.6	0.0	0.0	10.5	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				765	0		430	689	0	0	345	
V/C Ratio(X)				0.97	0.00		0.92	0.28	0.00	0.00	0.81	
Avail Cap(c_a), veh/h				765	0		430	689	0	0	345	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				20.0	0.0	0.0	19.4	12.7	0.0	0.0	27.0	0.0
Incr Delay (d2), s/veh				24.3	0.0	0.0	24.6	0.8	0.0	0.0	17.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				22.6	0.0	0.0	11.8	3.3	0.0	0.0	9.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				44.3	0.0	0.0	44.0	13.5	0.0	0.0	44.3	0.0
LnGrp LOS				D	A		D	B	A	A	D	
Approach Vol, veh/h					739			591			280	
Approach Delay, s/veh					44.3			33.9			44.3	
Approach LOS					D			C			D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.5			17.0	18.5		34.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.5			11.0	12.5		29.0				
Max Q Clear Time (g_c+I1), s		7.6			14.0	12.5		30.3				
Green Ext Time (p_c), s		3.8			0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				40.5								
HCM 6th LOS				D								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	16	16	1	35	2	833	7	63	643	7
Future Volume (vph)	35	0	16	16	1	35	2	833	7	63	643	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	150		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1630	0	1129	1562	0	1727	1612	1648
Flt Permitted		0.973			0.881		0.377			0.277		
Satd. Flow (perm)	0	1693	1581	0	1458	0	448	1562	0	504	1612	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		36			1				39
Link Speed (mph)		25			25			40				40
Link Distance (ft)		750			1000			600				1240
Travel Time (s)		20.5			27.3			10.2				21.1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	17	0	54	0	2	875	0	66	670	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.6		58.4	58.4		58.4	58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12		0.83	0.83		0.83	0.83	0.83
v/c Ratio		0.17	0.07		0.26		0.01	0.67		0.16	0.50	0.01
Control Delay		28.4	2.4		16.9		3.0	8.8		6.5	8.4	0.6
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		28.4	2.4		16.9		3.0	8.8		6.5	8.4	0.6
LOS		C	A		B		A	A		A	A	A
Approach Delay		20.1			16.9			8.7			8.1	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)		14	0		7		0	166		12	206	0
Queue Length 95th (ft)		37	4		35		2	#398		m18	m243	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				150			225		100
Base Capacity (vph)		302	320		289		373	1302		420	1344	1381
Starvation Cap Reductn		0	0		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		0.12	0.05		0.19		0.01	0.67		0.16	0.50	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 73.1%

ICU Level of Service D

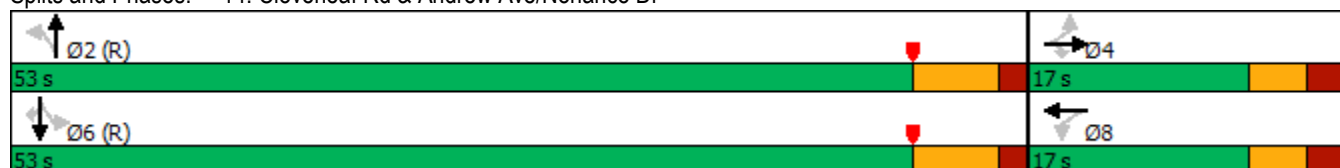
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	16	16	1	35	2	833	7	63	643	7
Future Volume (veh/h)	35	0	16	16	1	35	2	833	7	63	643	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	36	0	17	17	1	36	2	868	7	66	670	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	224	0	121	92	10	69	448	1278	10	448	1376	1302
Arrive On Green	0.06	0.00	0.08	0.06	0.08	0.06	0.79	0.79	0.77	1.00	1.00	1.00
Sat Flow, veh/h	1584	0	1586	325	126	903	438	1622	13	635	1747	1652
Grp Volume(v), veh/h	36	0	17	54	0	0	2	0	875	66	670	7
Grp Sat Flow(s),veh/h/ln	1584	0	1586	1354	0	0	438	0	1635	635	1747	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.5	0.0	0.0	0.1	0.0	17.1	2.6	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.7	2.9	0.0	0.0	0.1	0.0	17.1	19.7	0.0	0.0
Prop In Lane	1.00		1.00	0.31		0.67	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	201	0	121	152	0	0	448	0	1288	448	1376	1302
V/C Ratio(X)	0.18	0.00	0.14	0.36	0.00	0.00	0.00	0.00	0.68	0.15	0.49	0.01
Avail Cap(c_a), veh/h	336	0	283	308	0	0	448	0	1288	448	1376	1302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.24	0.24	0.24
Uniform Delay (d), s/veh	31.0	0.0	30.2	31.7	0.0	0.0	1.6	0.0	3.4	3.1	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.4	0.0	0.0	0.0	0.0	2.9	0.2	0.3	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	0.6	0.0	0.3	1.0	0.0	0.0	0.0	0.0	2.5	0.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.4	0.0	30.7	33.1	0.0	0.0	1.6	0.0	6.3	3.2	0.3	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	53		54				877			743		
Approach Delay, s/veh	31.2		33.1				6.3			0.6		
Approach LOS	C		C				A			A		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	60.2		9.8		60.2		9.8					
Change Period (Y+Rc), s	6.0		5.5		6.0		5.5					
Max Green Setting (Gmax), s	47.0		11.5		47.0		11.5					
Max Q Clear Time (g_c+I1), s	19.1		3.4		21.7		4.9					
Green Ext Time (p_c), s	22.1		0.1		17.0		0.1					
Intersection Summary												
HCM 6th Ctrl Delay			5.4									
HCM 6th LOS			A									

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	17	61	0	154	16	784	5	129	1038	34
Future Volume (vph)	15	0	17	61	0	154	16	784	5	129	1038	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	150		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1619	0	1693	1639	0	1727	1723	1648
Flt Permitted		0.460			0.899		0.119			0.262		
Satd. Flow (perm)	0	800	1581	0	1476	0	212	1639	0	476	1723	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		162			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	18	0	226	0	17	830	0	136	1093	36
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		0.0	-1.0		0.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		6.0	5.0		6.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.7		40.8	41.8		40.8	41.8	41.8
Actuated g/C Ratio		0.14	0.14		0.14		0.68	0.70		0.68	0.70	0.70
v/c Ratio		0.14	0.07		0.64		0.12	0.73		0.42	0.91	0.03
Control Delay		24.2	1.4		17.1		5.9	10.0		1.8	7.9	0.1
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		24.2	1.4		17.1		5.9	10.0		1.8	7.9	0.1
LOS		C	A		B		A	B		A	A	A
Approach Delay		12.1			17.1			9.9			7.1	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		21		3	182		3	28	0
Queue Length 95th (ft)		20	3		78		m6	m272		m4	m29	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				150			225		100
Base Capacity (vph)		140	322		391		144	1141		323	1199	1161
Starvation Cap Reductn		0	0		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		0.11	0.06		0.58		0.12	0.73		0.42	0.91	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 100.8%

ICU Level of Service G

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary

14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	17	61	0	154	16	784	5	129	1038	34
Future Volume (veh/h)	15	0	17	61	0	154	16	784	5	129	1038	34
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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	10	64	0	147	17	825	5	136	1093	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	300	0	278	143	17	190	428	1130	7	447	1231	1101
Arrive On Green	0.16	0.00	0.17	0.16	0.00	0.16	0.86	0.89	0.86	1.00	1.00	1.00
Sat Flow, veh/h	1031	0	1586	372	100	1084	474	1695	10	662	1846	1652
Grp Volume(v), veh/h	16	0	10	211	0	0	17	0	830	136	1093	35
Grp Sat Flow(s),veh/h/ln	1031	0	1586	1556	0	0	474	0	1706	662	1846	1652
Q Serve(g_s), s	0.0	0.0	0.3	6.0	0.0	0.0	0.3	0.0	9.4	4.3	0.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.3	7.9	0.0	0.0	0.3	0.0	9.4	13.7	0.0	0.0
Prop In Lane	1.00		1.00	0.30		0.70	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	283	0	278	325	0	0	428	0	1137	447	1231	1101
V/C Ratio(X)	0.06	0.00	0.04	0.65	0.00	0.00	0.04	0.00	0.73	0.30	0.89	0.03
Avail Cap(c_a), veh/h	283	0	278	325	0	0	428	0	1137	447	1231	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	21.2	0.0	20.5	24.1	0.0	0.0	1.4	0.0	1.7	1.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	4.5	0.0	0.0	0.2	0.0	4.1	0.2	1.0	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(95%),veh/ln	0.3	0.0	0.2	5.8	0.0	0.0	0.1	0.0	3.7	0.0	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	20.6	28.6	0.0	0.0	1.6	0.0	5.8	1.8	1.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	26			211			847			1264		
Approach Delay, s/veh	21.0			28.6			5.7			1.1		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			15.0			45.0			15.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	11.4			2.8			15.7			9.9		
Green Ext Time (p_c), s	21.2			0.0			22.0			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	5.4											
HCM 6th LOS	A											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	24	0	149	15	751	7	163	793	7
Future Volume (vph)	5	1	12	24	0	149	15	751	7	163	793	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	150		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1596	0	1693	1671	0	1727	1723	1648
Flt Permitted		0.708			0.950		0.264			0.284		
Satd. Flow (perm)	0	1232	1581	0	1527	0	470	1671	0	516	1723	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		157			2				45
Link Speed (mph)		25			25			40				40
Link Distance (ft)		750			1000			600				1240
Travel Time (s)		20.5			27.3			10.2				21.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	182	0	16	798	0	172	835	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.4	8.4		8.4		42.1	42.1		42.1	42.1	42.1
Actuated g/C Ratio		0.14	0.14		0.14		0.70	0.70		0.70	0.70	0.70
v/c Ratio		0.03	0.05		0.52		0.05	0.68		0.48	0.69	0.01
Control Delay		21.2	0.3		11.9		3.9	9.5		5.4	6.2	0.0
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		21.2	0.3		11.9		3.9	9.5		5.4	6.2	0.0
LOS		C	A		B		A	A		A	A	A
Approach Delay		6.9			11.9			9.4			6.0	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)		2	0		8		1	118		2	11	0
Queue Length 95th (ft)		10	0		54		7	289		m13	m115	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				150			225		100
Base Capacity (vph)		236	347		419		329	1172		361	1207	1168
Starvation Cap Reductn		0	0		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		0.03	0.04		0.43		0.05	0.68		0.48	0.69	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 7.9

Intersection LOS: A

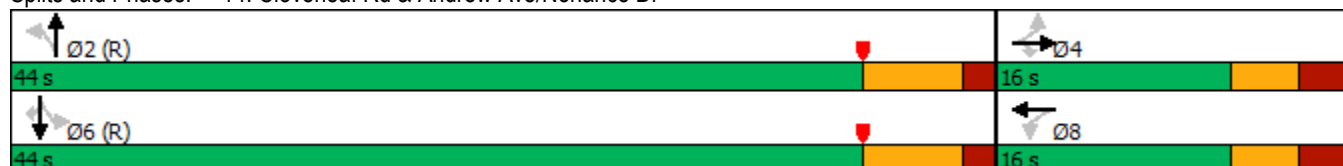
Intersection Capacity Utilization 83.9%

ICU Level of Service E

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2026 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	24	0	149	15	751	7	163	793	7
Future Volume (veh/h)	5	1	12	24	0	149	15	751	7	163	793	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	25	0	153	16	791	7	172	835	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	258	43	245	90	13	210	547	1180	10	407	1269	1135
Arrive On Green	0.14	0.15	0.15	0.14	0.00	0.14	0.69	0.69	0.67	1.00	1.00	1.00
Sat Flow, veh/h	956	278	1586	139	84	1362	621	1718	15	682	1846	1652
Grp Volume(v), veh/h	6	0	6	178	0	0	16	0	798	172	835	7
Grp Sat Flow(s),veh/h/ln	1234	0	1586	1584	0	0	621	0	1733	682	1846	1652
Q Serve(g_s), s	0.0	0.0	0.2	3.5	0.0	0.0	0.5	0.0	16.0	9.3	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	6.5	0.0	0.0	0.5	0.0	16.0	25.3	0.0	0.0
Prop In Lane	0.83		1.00	0.14		0.86	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	280	0	245	287	0	0	547	0	1191	407	1269	1135
V/C Ratio(X)	0.02	0.00	0.02	0.62	0.00	0.00	0.03	0.00	0.67	0.42	0.66	0.01
Avail Cap(c_a), veh/h	327	0	304	345	0	0	547	0	1191	407	1269	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.12	0.12	0.12
Uniform Delay (d), s/veh	21.9	0.0	21.5	24.6	0.0	0.0	3.0	0.0	5.4	4.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.4	0.0	0.0	0.1	0.0	3.0	0.4	0.3	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(95%),veh/ln	0.1	0.0	0.1	4.7	0.0	0.0	0.1	0.0	6.8	0.9	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	21.6	27.1	0.0	0.0	3.1	0.0	8.5	5.3	0.3	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	12			178			814			1014		
Approach Delay, s/veh	21.7			27.1			8.4			1.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	46.2			13.8			46.2			13.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	18.0			2.2			27.3			8.5		
Green Ext Time (p_c), s	15.6			0.0			9.5			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	6.5											
HCM 6th LOS	A											

APPENDIX L11

2031 NO BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 No Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	415	81	83	370	148	144
Future Volume (vph)	415	81	83	370	148	144
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1681	0	1662	1766	1534	0
Flt Permitted			0.244		0.975	
Satd. Flow (perm)	1681	0	427	1766	1534	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	17					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	551	0	92	411	324	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.6		42.3	41.1	18.5	
Actuated g/C Ratio	0.45		0.60	0.59	0.26	
v/c Ratio	0.72		0.23	0.40	0.80	
Control Delay	23.5		5.4	6.5	41.3	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	23.5		5.4	6.5	41.3	
LOS	C		A	A	D	
Approach Delay	23.5			6.3	41.3	
Approach LOS	C			A	D	
Queue Length 50th (ft)	193		12	58	129	
Queue Length 95th (ft)	#358		m22	82	#253	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	768		399	1037	411	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.72		0.23	0.40	0.79	

Intersection Summary

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	34 s	24 s
↖ Ø6 (R)		
46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2031 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	415	81	83	370	148	144
Future Volume (veh/h)	415	81	83	370	148	144
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	461	84	92	411	164	160
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	648	118	426	1174	199	194
Arrive On Green	0.48	0.46	0.15	1.00	0.24	0.23
Sat Flow, veh/h	1356	247	1846	1927	822	802
Grp Volume(v), veh/h	0	545	92	411	325	0
Grp Sat Flow(s),veh/h/ln	0	1603	1846	1927	1628	0
Q Serve(g_s), s	0.0	18.8	1.5	0.0	13.3	0.0
Cycle Q Clear(g_c), s	0.0	18.8	1.5	0.0	13.3	0.0
Prop In Lane		0.15	1.00		0.50	0.49
Lane Grp Cap(c), veh/h	0	767	426	1174	395	0
V/C Ratio(X)	0.00	0.71	0.22	0.35	0.82	0.00
Avail Cap(c_a), veh/h	0	767	500	1174	437	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	14.5	9.1	0.0	25.3	0.0
Incr Delay (d2), s/veh	0.0	5.5	0.3	0.8	15.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	11.4	0.9	0.5	10.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	20.0	9.4	0.8	41.2	0.0
LnGrp LOS	A	C	A	A	D	A
Approach Vol, veh/h	545			503	325	
Approach Delay, s/veh	20.0			2.4	41.2	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.2	38.7		22.2		47.8
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.5	20.8		15.3		2.0
Green Ext Time (p_c), s	0.1	4.4		0.7		10.7

Intersection Summary

HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	588	1	0	551	42	0	0	2	42	0	36
Future Volume (vph)	26	588	1	0	551	42	0	0	2	42	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	662	0	0	666	0	0	2	0	47	40	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 47.3%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	588	1	0	551	42	0	0	2	42	0	36
Future Vol, veh/h	26	588	1	0	551	42	0	0	2	42	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	29	661	1	0	619	47	0	0	2	47	0	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	666	0	0	662	0	0	1384	1386	663	1365	1363	644
Stage 1	-	-	-	-	-	-	720	720	-	643	643	-
Stage 2	-	-	-	-	-	-	664	666	-	722	720	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	742	-	-	568	-	-	154	169	413	171	187	468
Stage 1	-	-	-	-	-	-	510	471	-	580	525	-
Stage 2	-	-	-	-	-	-	546	496	-	530	491	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	742	-	-	568	-	-	136	162	413	165	180	468
Mov Cap-2 Maneuver	-	-	-	-	-	-	136	162	-	165	180	-
Stage 1	-	-	-	-	-	-	490	453	-	557	525	-
Stage 2	-	-	-	-	-	-	498	496	-	506	472	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	13.8	25.2
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	413	742	-	-	568	-	-	165	468
HCM Lane V/C Ratio	0.005	0.039	-	-	-	-	-	0.286	0.086
HCM Control Delay (s)	13.8	10.1	-	-	0	-	-	35.3	13.4
HCM Lane LOS	B	B	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1.1	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	497	45	64	479	6	106	2	74	4	3	2
Future Volume (vph)	3	497	45	64	479	6	106	2	74	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.466			0.325			0.754			0.702		
Satd. Flow (perm)	810	1667	1552	527	1558	1608	1302	1516	0	1302	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45			82			2
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	552	50	71	532	7	118	84	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	42.2	42.2	42.2	52.2	52.1	52.1	10.9	10.9		10.7	10.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.75	0.74	0.74	0.16	0.16		0.15	0.15	
v/c Ratio	0.01	0.55	0.05	0.14	0.46	0.01	0.58	0.28		0.02	0.02	
Control Delay	6.7	8.9	0.1	1.6	3.1	0.0	39.4	9.7		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	8.9	0.1	1.6	3.1	0.0	39.4	9.7		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		8.1			2.9			27.1			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	85	0	7	62	0	47	1		1	1	
Queue Length 95th (ft)	m1	m118	m0	2	11	m0	96	35		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	488	1005	988	516	1159	1207	225	329		225	320	
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	0.01	0.55	0.05	0.14	0.46	0.01	0.52	0.26		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 65.7%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	497	45	64	479	6	106	2	74	4	3	2
Future Volume (veh/h)	3	497	45	64	479	6	106	2	74	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	552	34	71	532	6	118	2	44	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	682	1180	1044	651	1162	1114	285	9	202	260	147	98
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	955	1947	1722	1640	1609	1542	1461	73	1614	1466	1176	784
Grp Volume(v), veh/h	3	552	34	71	532	6	118	0	46	4	0	5
Grp Sat Flow(s),veh/h/ln	955	1947	1722	1640	1609	1542	1461	0	1687	1466	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	5.4	0.0	1.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.0	0.0	0.0	5.4	0.0	1.7	1.4	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	682	1180	1044	651	1162	1114	285	0	211	260	0	245
V/C Ratio(X)	0.00	0.47	0.03	0.11	0.46	0.01	0.41	0.00	0.22	0.02	0.00	0.02
Avail Cap(c_a), veh/h	682	1180	1044	765	1162	1114	355	0	292	330	0	339
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)	1.00	1.00	1.00	0.92	0.92	0.92	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.3	0.0	0.0	29.2	0.0	28.0	28.0	0.0	27.0
Incr Delay (d2), s/veh	0.0	1.3	0.1	0.1	1.2	0.0	1.0	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.8	0.0	0.3	0.7	0.0	3.5	0.0	1.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.3	0.1	3.4	1.2	0.0	30.1	0.0	28.5	28.0	0.0	27.1
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	589			609			164			9		
Approach Delay, s/veh	1.3			1.4			29.7			27.5		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.1	48.2	13.6		56.4		13.6					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.5	2.5	3.9		2.5		7.9					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.9
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	421	14	5	516	13	9	0	15	6	0	8
Future Volume (vph)	26	421	14	5	516	13	9	0	15	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1659	0	1744	1654	1445	0	1727	0	1719	1501	0
Flt Permitted	0.382			0.495				0.870				
Satd. Flow (perm)	674	1659	0	909	1654	1415	0	1530	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				126		139			402	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	468	0	5	555	14	0	26	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.31		0.01	0.40	0.01		0.09		0.03	0.02	
Control Delay	0.9	2.3		4.0	5.1	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.9	2.3		4.0	5.1	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.2			5.0			0.7			11.5	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	66		m2	168	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	676	1492		760	1383	1204		325		242	549	
Starvation Cap Reductn	0	0		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	0.04	0.31		0.01	0.40	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 3.7

Intersection LOS: A

Intersection Capacity Utilization 45.2%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary 10: Driveway/Market Sq Dr & SR 0230

2031 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	421	14	5	516	13	9	0	15	6	0	8
Future Volume (veh/h)	26	421	14	5	516	13	9	0	15	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	28	453	15	5	555	14	10	0	15	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	712	1282	42	799	1295	1123	88	0	24	161	70	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1565	52	964	1793	1554	418	0	626	1360	1837	0
Grp Volume(v), veh/h	28	0	468	5	555	14	25	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1617	964	1793	1554	1044	0	0	1360	1837	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.40		0.60	1.00		0.00
Lane Grp Cap(c), veh/h	712	0	1325	799	1295	1123	97	0	0	161	70	0
V/C Ratio(X)	0.04	0.00	0.35	0.01	0.43	0.01	0.26	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	811	0	1325	799	1295	1123	241	0	0	292	247	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(l)	0.82	0.00	0.82	0.92	0.92	0.92	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	33.9	0.0	0.0	32.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.0	1.0	0.0	1.4	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.4	0.0	0.6	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.6	0.0	1.0	0.0	35.3	0.0	0.0	32.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	496			574			25			6		
Approach Delay, s/veh	0.7			0.9			35.3			32.6		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.8	56.0	7.3		62.7		7.3					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.8	2.5	2.7		2.5		3.7					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.5		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	1.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	390	1	11	416	25	61	27	37	29	16	48
Future Volume (vph)	39	390	1	11	416	25	61	27	37	29	16	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1591	0	1248	1495	0	0	1794	0
Flt Permitted	0.470			0.505			0.756				0.870	
Satd. Flow (perm)	833	1685	0	662	1591	0	993	1495	0	0	1584	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			40			52	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	420	0	12	474	0	66	69	0	0	100	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.2	52.2		52.2	52.2		11.2	11.2			11.2	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.07	0.33		0.02	0.40		0.42	0.25			0.34	
Control Delay	1.1	1.4		4.6	6.1		33.3	15.1			16.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.4		4.6	6.1		33.3	15.1			16.6	
LOS	A	A		A	A		C	B			B	
Approach Delay		1.4			6.1			24.0			16.6	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	8		1	69		26	11			18	
Queue Length 95th (ft)	3	17		7	155		57	40			53	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	621	1256		494	1188		283	455			489	
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	0.07	0.33		0.02	0.40		0.23	0.15			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 7.2

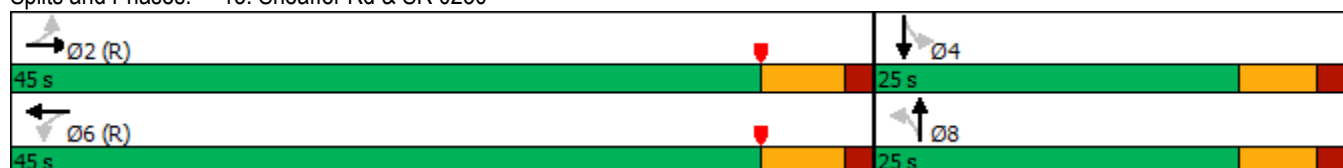
Intersection LOS: A

Intersection Capacity Utilization 54.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2031 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	390	1	11	416	25	61	27	37	29	16	48
Future Volume (veh/h)	39	390	1	11	416	25	61	27	37	29	16	48
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		0.99	1.00		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	42	419	0	12	447	26	66	29	18	31	17	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	683	1275	0	686	1297	75	218	97	60	113	45	62
Arrive On Green	1.00	1.00	0.00	0.76	0.76	0.74	0.10	0.10	0.09	0.09	0.10	0.09
Sat Flow, veh/h	861	1680	0	768	1709	99	999	975	605	423	452	620
Grp Volume(v), veh/h	42	419	0	12	0	473	66	0	47	82	0	0
Grp Sat Flow(s),veh/h/ln	861	1680	0	768	0	1809	999	0	1580	1494	0	0
Q Serve(g_s), s	0.4	0.0	0.0	0.3	0.0	6.0	0.0	0.0	1.9	2.0	0.0	0.0
Cycle Q Clear(g_c), s	6.4	0.0	0.0	0.3	0.0	6.0	3.4	0.0	1.9	3.9	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.05	1.00		0.38	0.38		0.41
Lane Grp Cap(c), veh/h	683	1275	0	686	0	1373	218	0	157	198	0	0
V/C Ratio(X)	0.06	0.33	0.00	0.02	0.00	0.34	0.30	0.00	0.30	0.41	0.00	0.00
Avail Cap(c_a), veh/h	683	1275	0	686	0	1373	404	0	452	507	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(l)	0.96	0.96	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	2.1	0.0	2.8	29.9	0.0	29.4	30.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.7	0.0	0.0	0.0	0.7	0.8	0.0	1.1	1.4	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(95%),veh/ln	0.1	0.4	0.0	0.0	0.0	2.0	1.9	0.0	1.3	2.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	0.7	0.0	2.1	0.0	3.4	30.7	0.0	30.5	31.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	461			485			113			82		
Approach Delay, s/veh	0.6			3.4			30.6			31.9		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	58.0			12.0			58.0			12.0		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			5.9			8.0			5.4		
Green Ext Time (p_c), s	12.1			0.2			13.3			0.3		

Intersection Summary

HCM 6th Ctrl Delay	7.0
HCM 6th LOS	A

Notes

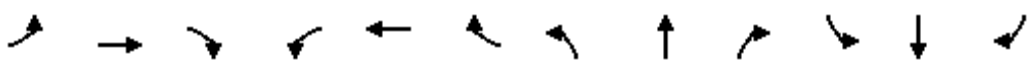
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	334	0	91	541	142	0	0	193	58
Future Volume (vph)	0	0	0	334	0	91	541	142	0	0	193	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.469					
Satd. Flow (perm)	0	0	0	0	1546	1145	762	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	348	95	564	148	0	0	201	60
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					15.8	15.8	32.7	32.7			15.6	15.6
Actuated g/C Ratio					0.27	0.27	0.56	0.56			0.27	0.27
v/c Ratio					0.83	0.22	0.95	0.18			0.49	0.11
Control Delay					39.4	2.1	41.6	7.1			22.7	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					39.4	2.1	41.6	7.1			22.7	0.4
LOS					D	A	D	A			C	A
Approach Delay					31.4			34.4			17.6	
Approach LOS					C			C			B	
Queue Length 50th (ft)					117	0	124	23			60	0
Queue Length 95th (ft)					#245	9	#378	47			114	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					441	443	591	836			448	556
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					0.79	0.21	0.95	0.18			0.45	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 30.4

Intersection LOS: C

Intersection Capacity Utilization 89.5%

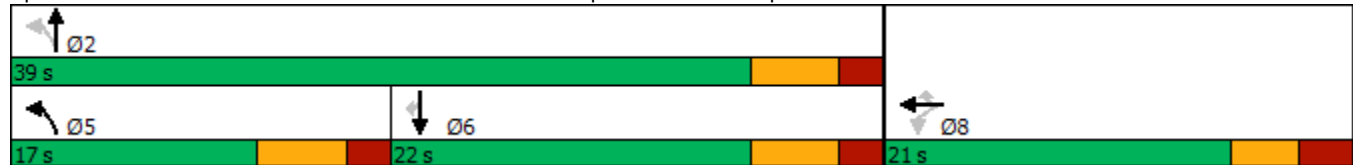
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	334	0	91	541	142	0	0	193	58
Future Volume (veh/h)	0	0	0	334	0	91	541	142	0	0	193	58
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				348	0	0	564	148	0	0	201	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				447	0		657	844	0	0	410	
Arrive On Green				0.23	0.00	0.00	0.23	0.57	0.00	0.00	0.25	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				348	0	0	564	148	0	0	201	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				9.6	0.0	0.0	12.0	2.5	0.0	0.0	5.5	0.0
Cycle Q Clear(g_c), s				9.6	0.0	0.0	12.0	2.5	0.0	0.0	5.5	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				447	0		657	844	0	0	410	
V/C Ratio(X)				0.78	0.00		0.86	0.18	0.00	0.00	0.49	
Avail Cap(c_a), veh/h				559	0		657	957	0	0	536	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.9	0.0	0.0	11.7	5.4	0.0	0.0	17.0	0.0
Incr Delay (d2), s/veh				5.5	0.0	0.0	11.0	0.4	0.0	0.0	3.3	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
%ile BackOfQ(95%),veh/ln				7.8	0.0	0.0	9.1	1.0	0.0	0.0	3.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				24.4	0.0	0.0	22.7	5.8	0.0	0.0	20.3	0.0
LnGrp LOS				C	A		C	A	A	A	C	
Approach Vol, veh/h					348			712			201	
Approach Delay, s/veh					24.4			19.2			20.3	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		17.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		4.5			14.0	7.5		11.6				
Green Ext Time (p_c), s		3.2			0.0	2.0		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				20.8								
HCM 6th LOS				C								

Notes

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

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	2	245	0	0	0	0	650	586	111	409	0
Future Volume (vph)	33	2	245	0	0	0	0	650	586	111	409	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	37	261	0	0	0	0	1314	0	118	435	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 89.5% ICU Level of Service E

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2031 No Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↱	
Traffic Vol, veh/h	33	2	245	0	0	0	0	650	586	111	409	0
Future Vol, veh/h	33	2	245	0	0	0	0	650	586	111	409	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	35	2	261	0	0	0	0	691	623	118	435	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1362	1362	435	-	0	0	691	0	0
Stage 1	671	671	-	-	-	-	-	-	-
Stage 2	691	691	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	156	187	658	0	-	-	715	-	0
Stage 1	607	512	-	0	-	-	-	-	0
Stage 2	595	503	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	130	0	658	-	-	-	715	-	-
Mov Cap-2 Maneuver	130	0	-	-	-	-	-	-	-
Stage 1	607	0	-	-	-	-	-	-	-
Stage 2	497	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.7	0	2.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	130	658	715	-
HCM Lane V/C Ratio	-	-	0.286	0.396	0.165	-
HCM Control Delay (s)	-	-	43.4	14	11	-
HCM Lane LOS	-	-	E	B	B	-
HCM 95th %tile Q(veh)	-	-	1.1	1.9	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 No Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	25	0	1218	646	5
Future Volume (vph)	6	25	0	1218	646	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1622	0	0	1734	1653	0
Flt Permitted	0.990					
Satd. Flow (perm)	1622	0	0	1734	1653	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	1353	724	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	74.1%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 No Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	0	1218	646	5
Future Vol, veh/h	6	25	0	1218	646	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	28	0	1353	718	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2074	721	724	0	-	0
Stage 1	721	-	-	-	-	-
Stage 2	1353	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	63	450	729	-	-	-
Stage 1	541	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	63	450	729	-	-	-
Mov Cap-2 Maneuver	63	-	-	-	-	-
Stage 1	541	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	26	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	729	-	206	-	-	
HCM Lane V/C Ratio	-	-	0.167	-	-	
HCM Control Delay (s)	0	-	26	-	-	
HCM Lane LOS	A	-	D	-	-	
HCM 95th %tile Q(veh)	0	-	0.6	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	20	91	8	13	77	32	792	8	11	519	154
Future Volume (vph)	349	20	91	8	13	77	32	792	8	11	519	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1577	0	1391	1565	0	1500	1615	0	1628	1575	0
Flt Permitted	0.692			0.678			0.225			0.129		
Satd. Flow (perm)	1168	1577	0	991	1565	0	355	1615	0	221	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		101			86			1			35	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	388	123	0	9	100	0	36	889	0	12	748	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.17	0.24		0.03	0.20		0.18	0.98		0.10	0.83	
Control Delay	129.6	7.6		18.6	7.4		8.3	36.8		9.4	22.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	129.6	7.6		18.6	7.4		8.3	36.8		9.4	22.1	
LOS	F	A		B	A		A	D		A	C	
Approach Delay		100.3			8.3			35.7			21.9	
Approach LOS		F			A			D			C	
Queue Length 50th (ft)	~203	7		3	4		4	346		2	228	
Queue Length 95th (ft)	#359	43		13	36		m10	#602		10	#464	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	333	522		283	508		200	911		124	904	
Starvation Cap Reductn	0	0		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	1.17	0.24		0.03	0.20		0.18	0.98		0.10	0.83	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.17

Intersection Signal Delay: 44.1

Intersection LOS: D

Intersection Capacity Utilization 80.3%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

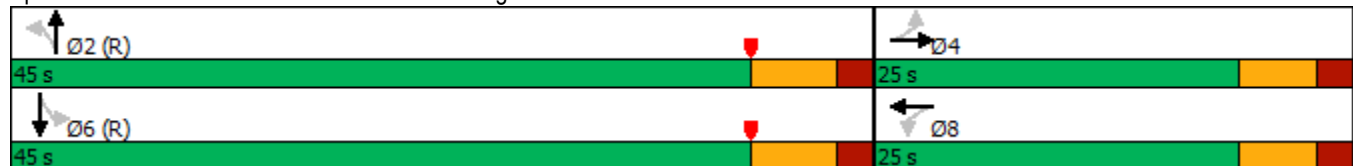
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary
11: Cloverleaf Rd & Schwanger Rd

2031 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	20	91	8	13	77	32	792	8	11	519	154
Future Volume (veh/h)	349	20	91	8	13	77	32	792	8	11	519	154
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	388	22	101	9	14	86	36	880	9	12	577	171
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	418	92	422	350	59	362	263	995	10	471	755	224
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1354	321	1476	1061	206	1266	686	1763	18	652	1339	397
Grp Volume(v), veh/h	388	0	123	9	0	100	36	0	889	12	0	748
Grp Sat Flow(s),veh/h/ln	1354	0	1797	1061	0	1472	686	0	1781	652	0	1735
Q Serve(g_s), s	16.3	0.0	3.7	0.5	0.0	3.7	2.4	0.0	0.0	0.6	0.0	23.2
Cycle Q Clear(g_c), s	20.0	0.0	3.7	4.2	0.0	3.7	25.6	0.0	0.0	0.6	0.0	23.2
Prop In Lane	1.00		0.82	1.00		0.86	1.00		0.01	1.00		0.23
Lane Grp Cap(c), veh/h	418	0	513	350	0	421	263	0	1005	471	0	979
V/C Ratio(X)	0.93	0.00	0.24	0.03	0.00	0.24	0.14	0.00	0.88	0.03	0.00	0.76
Avail Cap(c_a), veh/h	418	0	513	350	0	421	263	0	1005	471	0	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.72	0.00	0.72	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	19.5	20.8	0.0	19.5	7.5	0.0	0.0	6.8	0.0	11.8
Incr Delay (d2), s/veh	26.9	0.0	0.2	0.0	0.0	0.3	0.8	0.0	8.5	0.1	0.0	5.6
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(95%),veh/ln	14.5	0.0	2.7	0.2	0.0	2.2	0.5	0.0	4.3	0.1	0.0	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	0.0	19.7	20.8	0.0	19.8	8.3	0.0	8.5	6.9	0.0	17.4
LnGrp LOS	E	A	B	C	A	B	A	A	A	A	A	B
Approach Vol, veh/h	511			109			925			760		
Approach Delay, s/veh	46.7			19.9			8.5			17.3		
Approach LOS	D			B			A			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			25.2			6.2		
Green Ext Time (p_c), s	28.6			0.0			10.7			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	20.4											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	9	2	796	7	25	570	7
Future Volume (vph)	36	0	17	17	1	9	2	796	7	25	570	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1686	0	0	1561	0	0	1615	1648
Flt Permitted		0.739			0.783			0.999			0.955	
Satd. Flow (perm)	0	1286	1581	0	1362	0	0	1559	0	0	1545	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		9			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	28	0	0	838	0	0	620	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.6			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.24	0.08		0.16			0.64			0.48	0.01
Control Delay		30.5	2.8		22.5			7.9			8.4	0.4
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		30.5	2.8		22.5			7.9			8.4	0.4
LOS		C	A		C			A			A	A
Approach Delay		21.6			22.5			7.9			8.3	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		15	0		7			152			176	0
Queue Length 95th (ft)		40	5		28			347			m261	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		229	320		250			1300			1288	1380
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		0.17	0.06		0.11			0.64			0.48	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 8.8

Intersection LOS: A

Intersection Capacity Utilization 70.2%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
53 s	17 s
 Ø6 (R)	 Ø8
53 s	17 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	9	2	796	7	25	570	7
Future Volume (veh/h)	36	0	17	17	1	9	2	796	7	25	570	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	9	2	829	7	26	594	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	208	0	104	120	9	21	52	1294	11	78	1325	1319
Arrive On Green	0.05	0.00	0.07	0.05	0.07	0.05	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1599	0	1586	549	133	323	1	1620	14	31	1659	1652
Grp Volume(v), veh/h	38	0	18	28	0	0	838	0	0	620	0	7
Grp Sat Flow(s),veh/h/ln	1599	0	1586	1004	0	0	1634	0	0	1690	0	1652
Q Serve(g_s), s	0.0	0.0	0.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.8	2.4	0.0	0.0	15.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.64		0.32	0.00		0.01	0.04		1.00
Lane Grp Cap(c), veh/h	185	0	104	136	0	0	1333	0	0	1379	0	1319
V/C Ratio(X)	0.21	0.00	0.17	0.21	0.00	0.00	0.63	0.00	0.00	0.45	0.00	0.01
Avail Cap(c_a), veh/h	338	0	283	302	0	0	1333	0	0	1379	0	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.47	0.00	0.47
Uniform Delay (d), s/veh	31.7	0.0	30.9	32.4	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	0.7	0.0	0.0	2.3	0.0	0.0	0.5	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(95%),veh/ln	1.2	0.0	0.5	0.9	0.0	0.0	4.1	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	0.0	31.7	33.1	0.0	0.0	5.2	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56			28			838			627		
Approach Delay, s/veh	32.1			33.1			5.2			0.5		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	60.9			9.1			60.9			9.1		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	47.0			11.5			47.0			11.5		
Max Q Clear Time (g_c+I1), s	17.1			3.5			2.0			4.4		
Green Ext Time (p_c), s	22.5			0.1			21.9			0.0		
Intersection Summary												
HCM 6th Ctrl Delay			4.8									
HCM 6th LOS			A									

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	198	39	3	180	207	75	374	12	111	235	214
Future Volume (vph)	273	198	39	3	180	207	75	374	12	111	235	214
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1716	0	1500	1509	1388
Flt Permitted	0.414			0.626			0.529			0.268		
Satd. Flow (perm)	647	1660	1088	785	1649	1561	912	1716	0	423	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		2				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	290	211	41	3	191	220	80	411	0	118	250	228
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	29.8	29.8	29.8	14.5	14.5	14.5	26.4	20.4		26.5	20.5	20.5
Actuated g/C Ratio	0.41	0.41	0.41	0.20	0.20	0.20	0.36	0.28		0.37	0.28	0.28
v/c Ratio	0.77	0.31	0.08	0.02	0.58	0.44	0.20	0.85		0.43	0.59	0.41
Control Delay	34.4	17.5	0.3	25.0	35.7	6.2	13.6	44.4		18.1	30.4	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	34.4	17.5	0.3	25.0	35.7	6.2	13.6	44.4		18.1	30.4	5.9
LOS	C	B	A	C	D	A	B	D		B	C	A
Approach Delay		25.3			19.9			39.4			18.6	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	103	69	0	1	84	0	20	177		30	99	0
Queue Length 95th (ft)	#216	119	0	8	148	45	48	#362		67	187	50

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	377	768	584	198	416	573	414	519		275	456	581
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.77	0.27	0.07	0.02	0.46	0.38	0.19	0.79		0.43	0.55	0.39

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.5

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 25.6

Intersection LOS: C

Intersection Capacity Utilization 73.2%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	198	39	3	180	207	75	374	12	111	235	214
Future Volume (veh/h)	273	198	39	3	180	207	75	374	12	111	235	214
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	290	211	28	3	191	0	80	398	11	118	250	198
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	426	693	489	257	326		376	490	14	305	421	372
Arrive On Green	0.14	0.41	0.41	0.19	0.19	0.00	0.07	0.24	0.23	0.10	0.28	0.28
Sat Flow, veh/h	1641	1709	1206	811	1724	1532	1988	2002	55	1522	1528	1352
Grp Volume(v), veh/h	290	211	28	3	191	0	80	0	409	118	250	198
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	811	1724	1532	1988	0	2057	1522	1528	1352
Q Serve(g_s), s	9.5	5.8	1.0	0.2	7.0	0.0	2.0	0.0	13.0	3.8	9.8	8.6
Cycle Q Clear(g_c), s	9.5	5.8	1.0	0.2	7.0	0.0	2.0	0.0	13.0	3.8	9.8	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	426	693	489	257	326		376	0	503	305	421	372
V/C Ratio(X)	0.68	0.30	0.06	0.01	0.59		0.21	0.00	0.81	0.39	0.59	0.53
Avail Cap(c_a), veh/h	426	815	575	315	448		474	0	639	334	475	420
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	13.9	12.5	22.9	25.6	0.0	17.6	0.0	24.7	17.6	21.7	21.3
Incr Delay (d2), s/veh	4.4	0.1	0.0	0.0	0.6	0.0	0.3	0.0	6.3	0.8	1.6	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(95%),veh/ln	6.4	3.4	0.4	0.1	4.8	0.0	1.6	0.0	11.3	2.3	6.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	14.0	12.5	22.9	26.2	0.0	17.9	0.0	30.9	18.4	23.3	22.5
LnGrp LOS	C	B	B	C	C		B	A	C	B	C	C
Approach Vol, veh/h	529			194			489			566		
Approach Delay, s/veh	18.5			26.2			28.8			22.0		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	12.7	22.9		33.6	10.6	25.1				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	9.5	6.3	15.0		8.3	4.5	12.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0		0.1	0.0	1.5				

Intersection Summary

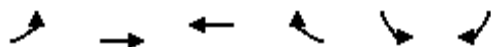
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2031 No Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	291	391	24	26	3
Future Volume (vph)	3	291	391	24	26	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1723	0	1554	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1723	0	1554	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	320	456	0	32	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 32.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	291	391	24	26	3
Future Vol, veh/h	3	291	391	24	26	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	320	430	26	29	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	456	0	0 769 443
Stage 1	-	-	- 443 -
Stage 2	-	-	- 326 -
Critical Hdwy	4.4	-	- 6.84 6.7
Critical Hdwy Stg 1	-	-	- 5.84 -
Critical Hdwy Stg 2	-	-	- 5.84 -
Follow-up Hdwy	3.3	-	- 3 3.4
Pot Cap-1 Maneuver	764	-	- 377 568
Stage 1	-	-	- 699 -
Stage 2	-	-	- 808 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	764	-	- 375 568
Mov Cap-2 Maneuver	-	-	- 511 -
Stage 1	-	-	- 696 -
Stage 2	-	-	- 808 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	764	-	-	-	516
HCM Lane V/C Ratio	0.004	-	-	-	0.062
HCM Control Delay (s)	9.7	-	-	-	12.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2031 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	23	35	6	44	115	47	314	9	26	173	75
Future Volume (vph)	64	23	35	6	44	115	47	314	9	26	173	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1308	0	0	1540	0	0	1664	0	0	1508	0
Flt Permitted		0.974			0.998			0.994			0.995	
Satd. Flow (perm)	0	1308	0	0	1540	0	0	1664	0	0	1508	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	0	0	172	0	0	385	0	0	285	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	55.0%											
Analysis Period (min)	15											
ICU Level of Service B												

Intersection	
Intersection Delay, s/veh	14.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	64	23	35	6	44	115	47	314	9	26	173	75
Future Vol, veh/h	64	23	35	6	44	115	47	314	9	26	173	75
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	67	24	36	6	46	120	49	327	9	27	180	78
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.2	10.9	16.9	14
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	52%	4%	9%
Vol Thru, %	85%	19%	27%	63%
Vol Right, %	2%	29%	70%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	370	122	165	274
LT Vol	47	64	6	26
Through Vol	314	23	44	173
RT Vol	9	35	115	75
Lane Flow Rate	385	127	172	285
Geometry Grp	1	1	1	1
Degree of Util (X)	0.601	0.244	0.272	0.466
Departure Headway (Hd)	5.618	6.911	5.688	5.883
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	640	517	627	611
Service Time	3.675	4.989	3.761	3.945
HCM Lane V/C Ratio	0.602	0.246	0.274	0.466
HCM Control Delay	16.9	12.2	10.9	14
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	4	0.9	1.1	2.5

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	677	89	199	508	128	130
Future Volume (vph)	677	89	199	508	128	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1799	0	1744	1958	1583	0
Flt Permitted			0.090		0.976	
Satd. Flow (perm)	1799	0	165	1958	1583	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	12					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	842	0	219	558	284	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	0.91		0.81	0.43	0.86	
Control Delay	34.2		33.3	7.5	56.2	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	34.2		33.3	7.5	56.2	
LOS	C		C	A	E	
Approach Delay	34.2			14.7	56.2	
Approach LOS	C			B	E	
Queue Length 50th (ft)	359		46	126	138	
Queue Length 95th (ft)	#617		m#100	m152	#271	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	923		269	1292	332	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.91		0.81	0.43	0.86	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 29.6	Intersection LOS: C
Intersection Capacity Utilization 82.9%	ICU Level of Service E
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	46 s	22 s
↖ Ø6 (R)		
58 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2031 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	677	89	199	508	128	130
Future Volume (veh/h)	677	89	199	508	128	130
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	744	89	219	558	141	143
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	806	96	311	1393	168	170
Arrive On Green	0.53	0.52	0.17	1.00	0.20	0.19
Sat Flow, veh/h	1521	182	1914	2090	825	837
Grp Volume(v), veh/h	0	833	219	558	285	0
Grp Sat Flow(s),veh/h/ln	0	1702	1914	2090	1668	0
Q Serve(g_s), s	0.0	36.0	3.9	0.0	13.1	0.0
Cycle Q Clear(g_c), s	0.0	36.0	3.9	0.0	13.1	0.0
Prop In Lane		0.11	1.00		0.49	0.50
Lane Grp Cap(c), veh/h	0	903	311	1393	340	0
V/C Ratio(X)	0.00	0.92	0.70	0.40	0.84	0.00
Avail Cap(c_a), veh/h	0	903	338	1393	350	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	17.3	15.6	0.0	30.8	0.0
Incr Delay (d2), s/veh	0.0	16.2	5.9	0.9	19.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	22.6	4.2	0.6	11.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	33.6	21.5	0.9	50.8	0.0
LnGrp LOS	A	C	C	A	D	A
Approach Vol, veh/h	833			777	285	
Approach Delay, s/veh	33.6			6.7	50.8	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.9	47.6		21.5		58.5
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	5.9	38.0		15.1		2.0
Green Ext Time (p_c), s	0.1	1.6		0.2		17.5
Intersection Summary						
HCM 6th Ctrl Delay			25.1			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	842	0	0	991	88	1	0	2	31	0	50
Future Volume (vph)	28	842	0	0	991	88	1	0	2	31	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1744	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	905	0	0	1161	0	0	3	0	33	54	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 68.7% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	842	0	0	991	88	1	0	2	31	0	50
Future Vol, veh/h	28	842	0	0	991	88	1	0	2	31	0	50
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	30	905	0	0	1066	95	1	0	2	33	0	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1161	0	0	905	0	0	2107	2126	905	2080	2079	1115
Stage 1	-	-	-	-	-	-	965	965	-	1114	1114	-
Stage 2	-	-	-	-	-	-	1142	1161	-	966	965	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	568	-	-	429	-	-	50	64	370	59	76	291
Stage 1	-	-	-	-	-	-	379	374	-	336	344	-
Stage 2	-	-	-	-	-	-	305	309	-	399	394	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	568	-	-	429	-	-	39	61	370	56	72	291
Mov Cap-2 Maneuver	-	-	-	-	-	-	39	61	-	56	72	-
Stage 1	-	-	-	-	-	-	359	354	-	318	344	-
Stage 2	-	-	-	-	-	-	248	309	-	376	373	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	43.4	65.2
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	97	568	-	-	429	-	-	56	291
HCM Lane V/C Ratio	0.033	0.053	-	-	-	-	-	0.595	0.185
HCM Control Delay (s)	43.4	11.7	-	-	0	-	-	137.9	20.2
HCM Lane LOS	E	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	2.4	0.7

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	637	38	157	781	18	279	3	120	24	8	17
Future Volume (vph)	15	637	38	157	781	18	279	3	120	24	8	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1742	0
Flt Permitted	0.301			0.180			0.740			0.675		
Satd. Flow (perm)	523	1766	1550	298	1697	1608	1314	1576	0	1251	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40			125			18
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	664	40	164	814	19	291	128	0	25	26	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.4	37.4	37.4	51.5	50.2	50.2	19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.64	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.07	0.80	0.05	0.51	0.77	0.02	0.93	0.27		0.08	0.06	
Control Delay	11.8	18.5	0.2	11.4	7.6	0.1	68.5	7.0		24.7	14.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.8	18.5	0.2	11.4	7.6	0.1	68.5	7.0		24.7	14.0	
LOS	B	B	A	B	A	A	E	A		C	B	
Approach Delay		17.3			8.1			49.7			19.3	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	3	128	0	5	27	0	143	1		10	3	
Queue Length 95th (ft)	m5	m184	m0	m40	62	m0	#290	42		29	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	244	825	785	327	1064	1023	313	471		298	429	
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	0.07	0.80	0.05	0.50	0.77	0.02	0.93	0.27		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 19.4

Intersection LOS: B

Intersection Capacity Utilization 92.6%

ICU Level of Service F

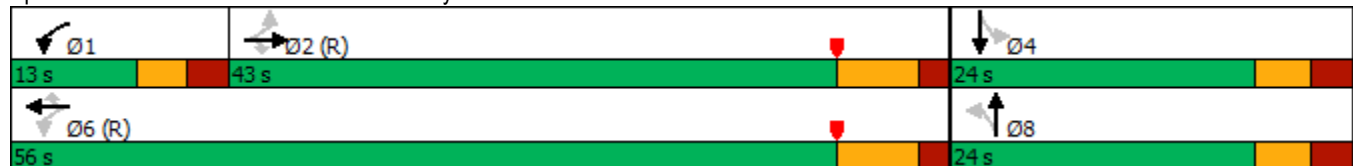
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	637	38	157	781	18	279	3	120	24	8	17
Future Volume (veh/h)	15	637	38	157	781	18	279	3	120	24	8	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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	16	664	25	164	814	16	291	3	85	25	8	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	444	989	849	559	1092	971	433	14	385	373	155	290
Arrive On Green	0.97	0.97	0.97	0.17	1.00	1.00	0.24	0.24	0.22	0.24	0.24	0.22
Sat Flow, veh/h	728	2032	1745	1666	1736	1542	1468	57	1627	1411	653	1225
Grp Volume(v), veh/h	16	664	25	164	814	16	291	0	88	25	0	23
Grp Sat Flow(s),veh/h/ln	728	2032	1745	1666	1736	1542	1468	0	1685	1411	0	1878
Q Serve(g_s), s	0.0	2.0	0.0	3.5	0.0	0.0	15.2	0.0	3.4	1.2	0.0	0.8
Cycle Q Clear(g_c), s	0.0	2.0	0.0	3.5	0.0	0.0	15.4	0.0	3.4	4.1	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.65
Lane Grp Cap(c), veh/h	444	989	849	559	1092	971	433	0	399	373	0	445
V/C Ratio(X)	0.04	0.67	0.03	0.29	0.75	0.02	0.67	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	444	989	849	592	1092	971	436	0	402	376	0	448
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)	1.00	1.00	1.00	0.70	0.70	0.70	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.5	0.6	0.5	6.4	0.0	0.0	29.3	0.0	25.0	26.0	0.0	23.8
Incr Delay (d2), s/veh	0.2	3.6	0.1	0.2	3.3	0.0	4.0	0.0	0.3	0.1	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(95%),veh/ln	0.0	2.3	0.0	1.6	1.8	0.0	9.6	0.0	2.5	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.7	4.2	0.6	6.6	3.3	0.0	33.3	0.0	25.3	26.1	0.0	23.9
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	705			994			379			48		
Approach Delay, s/veh	4.0			3.8			31.4			25.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	11.4	44.7	23.8			56.2	23.8					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2	* 18					
Max Q Clear Time (g_c+I1), s	6.0	4.5	6.6			2.5	17.9					
Green Ext Time (p_c), s	0.1	0.8	0.1			1.0	0.0					
Intersection Summary												
HCM 6th Ctrl Delay			9.3									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	459	1	11	786	76	9	2	1	43	3	116
Future Volume (vph)	88	459	1	11	786	76	9	2	1	43	3	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.211			0.487				0.707		0.750		
Satd. Flow (perm)	372	1729	0	813	1818	1561	0	1338	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			122	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	93	484	0	12	827	80	0	12	0	45	125	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.9	64.1		55.3	55.3	55.3		9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.23	0.35		0.02	0.66	0.07		0.08		0.29	0.44	
Control Delay	3.6	6.0		4.7	11.9	0.6		29.9		36.2	12.1	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0		0.0	0.0	
Total Delay	3.6	6.0		4.7	12.0	0.6		29.9		36.2	12.1	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		5.6			10.9			29.9			18.5	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	10	134		1	315	0		5		21	1	
Queue Length 95th (ft)	m17	m205		m3	403	m1		19		50	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	402	1384		561	1255	1112		224		227	353	
Starvation Cap Reductn	0	0		0	41	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	0.23	0.35		0.02	0.68	0.07		0.05		0.20	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 10.0

Intersection LOS: A

Intersection Capacity Utilization 68.9%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary 10: Driveway/Market Sq Dr & SR 0230

2031 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	459	1	11	786	76	9	2	1	43	3	116
Future Volume (veh/h)	88	459	1	11	786	76	9	2	1	43	3	116
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	93	483	1	12	827	71	9	2	0	45	3	66
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	565	1337	3	696	1331	1136	113	19	0	212	5	116
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.07	0.08	0.00	0.08	0.08	0.07
Sat Flow, veh/h	1629	1679	3	880	1935	1652	393	243	0	1376	67	1477
Grp Volume(v), veh/h	93	0	484	12	827	71	11	0	0	45	0	69
Grp Sat Flow(s),veh/h/ln	1629	0	1682	880	1935	1652	636	0	0	1376	0	1545
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	2.0	0.0	3.5
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.96
Lane Grp Cap(c), veh/h	565	0	1340	696	1331	1136	124	0	0	212	0	121
V/C Ratio(X)	0.16	0.00	0.36	0.02	0.62	0.06	0.09	0.00	0.00	0.21	0.00	0.57
Avail Cap(c_a), veh/h	612	0	1340	696	1331	1136	248	0	0	334	0	259
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	0.73	0.73	0.73	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.6	0.0	0.0	34.9	0.0	36.0
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.6	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.1	0.0	0.4	0.0	0.0	1.5	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.0	0.4	0.0	1.6	0.1	34.9	0.0	0.0	35.4	0.0	40.2
LnGrp LOS	A	A	A	A	A	A	C	A	A	D	A	D
Approach Vol, veh/h	577			910			11			114		
Approach Delay, s/veh	0.7			1.5			34.9			38.3		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.7	60.4		10.9		69.1		10.9				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.6	2.5		5.5		2.5		5.5				
Green Ext Time (p_c), s	0.0	1.2		0.2		0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				4.0								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	406	22	42	671	33	95	37	31	34	45	97
Future Volume (vph)	64	406	22	42	671	33	95	37	31	34	45	97
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1708	0	1573	1677	0	1572	1603	0	0	1801	0
Flt Permitted	0.302			0.475			0.513				0.921	
Satd. Flow (perm)	525	1708	0	786	1677	0	848	1603	0	0	1675	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			5			33			83	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	450	0	44	741	0	100	72	0	0	185	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	55.9	55.9		55.9	55.9		14.2	14.2			14.2	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.18	0.18			0.18	
v/c Ratio	0.18	0.38		0.08	0.63		0.67	0.23			0.51	
Control Delay	1.8	1.5		5.6	10.8		50.5	17.7			20.3	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0			0.0	
Total Delay	1.8	1.5		5.6	10.9		50.5	17.7			20.3	
LOS	A	A		A	B		D	B			C	
Approach Delay		1.6			10.6			36.8			20.3	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	1	8		6	166		47	17			45	
Queue Length 95th (ft)	3	9		21	364		90	46			94	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	366	1194		549	1172		286	562			620	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	37		0	0			1	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.18	0.38		0.08	0.65		0.35	0.13			0.30	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.6

Intersection LOS: B

Intersection Capacity Utilization 84.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)	 Ø4
48 s	32 s
 Ø6 (R)	 Ø8
48 s	32 s

HCM 6th Signalized Intersection Summary
13: Sheaffer Rd & SR 0230

2031 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	406	22	42	671	33	95	37	31	34	45	97
Future Volume (veh/h)	64	406	22	42	671	33	95	37	31	34	45	97
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	67	427	22	44	706	33	100	39	15	36	47	81
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	465	1186	61	783	1325	62	236	164	63	92	85	119
Arrive On Green	1.00	1.00	1.00	0.74	0.74	0.72	0.14	0.14	0.13	0.13	0.14	0.13
Sat Flow, veh/h	662	1610	83	940	1798	84	1179	1173	451	269	608	857
Grp Volume(v), veh/h	67	0	449	44	0	739	100	0	54	164	0	0
Grp Sat Flow(s),veh/h/ln	662	0	1693	940	0	1882	1179	0	1624	1734	0	0
Q Serve(g_s), s	2.2	0.0	0.0	1.0	0.0	13.6	0.5	0.0	2.4	4.4	0.0	0.0
Cycle Q Clear(g_c), s	15.8	0.0	0.0	1.0	0.0	13.6	7.7	0.0	2.4	7.2	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.04	1.00		0.28	0.22		0.49
Lane Grp Cap(c), veh/h	465	0	1247	783	0	1387	236	0	227	275	0	0
V/C Ratio(X)	0.14	0.00	0.36	0.06	0.00	0.53	0.42	0.00	0.24	0.60	0.00	0.00
Avail Cap(c_a), veh/h	465	0	1247	783	0	1387	470	0	548	611	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	0.00	0.95	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.8	0.0	0.0	2.9	0.0	4.6	33.0	0.0	30.8	33.0	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.8	0.1	0.0	1.5	1.2	0.0	0.5	2.1	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(95%),veh/ln	0.2	0.0	0.5	0.3	0.0	6.6	3.4	0.0	1.7	5.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.4	0.0	0.8	3.0	0.0	6.0	34.2	0.0	31.3	35.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	516			783			154			164		
Approach Delay, s/veh	1.0			5.9			33.2			35.1		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	63.8			16.2			63.8			16.2		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			9.2			15.6			9.7		
Green Ext Time (p_c), s	13.2			0.5			18.7			0.4		

Intersection Summary

HCM 6th Ctrl Delay	9.9
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	586	0	127	284	147	0	0	234	49
Future Volume (vph)	0	0	0	586	0	127	284	147	0	0	234	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.388					
Satd. Flow (perm)	0	0	0	0	1653	1414	649	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	617	134	299	155	0	0	246	52
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.3	25.3	28.9	28.9			15.9	15.9
Actuated g/C Ratio					0.40	0.40	0.45	0.45			0.25	0.25
v/c Ratio					0.94	0.21	0.72	0.23			0.59	0.10
Control Delay					45.5	3.0	24.7	11.7			27.8	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					45.5	3.0	24.7	11.7			27.8	0.4
LOS					D	A	C	B			C	A
Approach Delay					37.9			20.2			23.0	
Approach LOS					D			C			C	
Queue Length 50th (ft)					229	0	74	35			84	0
Queue Length 95th (ft)					#428	24	#154	68			151	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					661	656	413	712			442	541
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					0.93	0.20	0.72	0.22			0.56	0.10

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 63.7

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 29.6

Intersection LOS: C

Intersection Capacity Utilization 126.1%

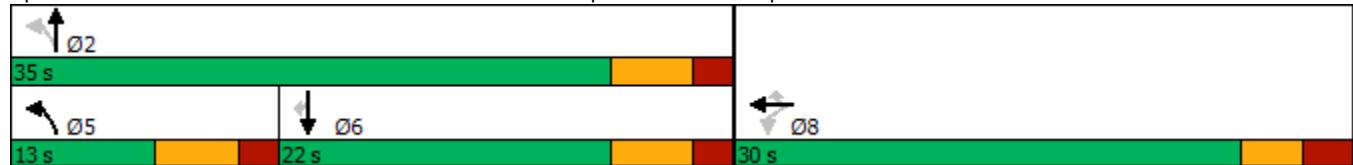
ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	586	0	127	284	147	0	0	234	49
Future Volume (veh/h)	0	0	0	586	0	127	284	147	0	0	234	49
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				617	0	0	299	155	0	0	246	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				704	0		451	701	0	0	397	
Arrive On Green				0.38	0.00	0.00	0.14	0.44	0.00	0.00	0.22	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				617	0	0	299	155	0	0	246	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				18.8	0.0	0.0	7.9	3.5	0.0	0.0	7.3	0.0
Cycle Q Clear(g_c), s				18.8	0.0	0.0	7.9	3.5	0.0	0.0	7.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				704	0		451	701	0	0	397	
V/C Ratio(X)				0.88	0.00		0.66	0.22	0.00	0.00	0.62	
Avail Cap(c_a), veh/h				777	0		451	809	0	0	519	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.9	0.0	0.0	14.2	10.1	0.0	0.0	20.6	0.0
Incr Delay (d2), s/veh				10.4	0.0	0.0	3.6	0.6	0.0	0.0	5.6	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
%ile BackOfQ(95%),veh/ln				13.9	0.0	0.0	5.1	2.0	0.0	0.0	5.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.3	0.0	0.0	17.8	10.6	0.0	0.0	26.2	0.0
LnGrp LOS				C	A		B	B	A	A	C	
Approach Vol, veh/h					617			454			246	
Approach Delay, s/veh					27.3			15.4			26.2	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		27.6				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		24.5				
Max Q Clear Time (g_c+I1), s		5.5			9.9	9.3		20.8				
Green Ext Time (p_c), s		3.0			0.0	2.1		1.3				
Intersection Summary												
HCM 6th Ctrl Delay				23.0								
HCM 6th LOS				C								

Notes

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

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	3	513	0	0	0	0	391	450	101	726	0
Future Volume (vph)	44	3	513	0	0	0	0	391	450	101	726	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1563	1569	0	0	0	0	1665	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1563	1569	0	0	0	0	1665	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	529	0	0	0	0	867	0	104	748	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	126.1%						ICU Level of Service H					
Analysis Period (min)	15											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2031 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh	28.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	44	3	513	0	0	0	0	391	450	101	726	0
Future Vol, veh/h	44	3	513	0	0	0	0	391	450	101	726	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	45	3	529	0	0	0	0	403	464	104	748	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1359	1359	748	-	0	0	403	0	0
Stage 1	956	956	-	-	-	-	-	-	-
Stage 2	403	403	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	155	188	~ 461	0	-	-	878	-	0
Stage 1	444	398	-	0	-	-	-	-	0
Stage 2	766	645	-	0	-	-	-	-	0
Platoon blocked, %				-	-	-	-	-	-
Mov Cap-1 Maneuver	137	0	~ 461	-	-	-	878	-	-
Mov Cap-2 Maneuver	137	0	-	-	-	-	-	-	-
Stage 1	444	0	-	-	-	-	-	-	-
Stage 2	676	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	111.4	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	137	461	878	-
HCM Lane V/C Ratio	-	-	0.354	1.147	0.119	-
HCM Control Delay (s)	-	-	45	117.5	9.7	-
HCM Lane LOS	-	-	E	F	A	-
HCM 95th %tile Q(veh)	-	-	1.5	18.9	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 No Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	825	1212	11
Future Volume (vph)	3	9	8	825	1212	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1801	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	859	1260	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	74.5%			ICU Level of Service D		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	825	1212	11
Future Vol, veh/h	3	9	8	825	1212	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	851	1249	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2122	1255	1260	0	-	0
Stage 1	1255	-	-	-	-	-
Stage 2	867	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	59	219	495	-	-	-
Stage 1	295	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	57	219	495	-	-	-
Mov Cap-2 Maneuver	57	-	-	-	-	-
Stage 1	286	-	-	-	-	-
Stage 2	459	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	36.1	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	495	-	128	-	-
HCM Lane V/C Ratio	0.017	-	0.097	-	-
HCM Control Delay (s)	12.4	0	36.1	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	35	80	9	42	37	61	577	14	51	844	331
Future Volume (vph)	226	35	80	9	42	37	61	577	14	51	844	331
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1685	0	1416	1704	0	1620	1693	0	1628	1672	0
Flt Permitted	0.703			0.679			0.107			0.356		
Satd. Flow (perm)	1199	1685	0	1012	1704	0	182	1693	0	610	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			39			4			63	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	238	121	0	9	83	0	64	622	0	54	1236	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	1.00	0.30		0.04	0.22		0.57	0.59		0.14	1.16	
Control Delay	87.1	10.9		20.2	14.3		32.7	13.2		5.8	97.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	87.1	10.9		20.2	14.3		32.7	13.2		5.8	97.4	
LOS	F	B		C	B		C	B		A	F	
Approach Delay		61.5			14.8			15.0			93.6	
Approach LOS		E			B			B			F	
Queue Length 50th (ft)	87	11		3	13		26	256		7	~541	
Queue Length 95th (ft)	#212	48		13	45		m#42	311		20	#767	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	239	404		202	372		113	1059		381	1068	
Starvation Cap Reductn	0	0		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	1.00	0.30		0.04	0.22		0.57	0.59		0.14	1.16	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.16

Intersection Signal Delay: 63.6

Intersection LOS: E

Intersection Capacity Utilization 96.8%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

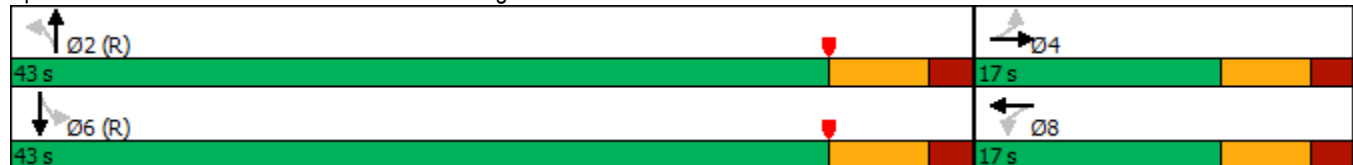
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary 11: Cloverleaf Rd & Schwanger Rd

2031 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	35	80	9	42	37	61	577	14	51	844	331
Future Volume (veh/h)	226	35	80	9	42	37	61	577	14	51	844	331
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	238	37	60	9	44	25	64	607	14	54	888	337
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	353	142	230	292	218	124	120	1129	26	392	829	315
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1404	709	1150	1108	1089	619	465	1806	42	837	1327	503
Grp Volume(v), veh/h	238	0	97	9	0	69	64	0	621	54	0	1225
Grp Sat Flow(s),veh/h/ln	1404	0	1859	1108	0	1708	465	0	1847	837	0	1830
Q Serve(g_s), s	10.0	0.0	2.7	0.4	0.0	2.0	0.0	0.0	18.0	2.8	0.0	37.5
Cycle Q Clear(g_c), s	12.0	0.0	2.7	3.1	0.0	2.0	37.5	0.0	18.0	20.8	0.0	37.5
Prop In Lane	1.00		0.62	1.00		0.36	1.00		0.02	1.00		0.28
Lane Grp Cap(c), veh/h	353	0	372	292	0	342	120	0	1155	392	0	1144
V/C Ratio(X)	0.67	0.00	0.26	0.03	0.00	0.20	0.53	0.00	0.54	0.14	0.00	1.07
Avail Cap(c_a), veh/h	353	0	372	292	0	342	120	0	1155	392	0	1144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.82	0.00	0.82	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.1	0.0	20.5	21.6	0.0	20.2	42.6	0.0	16.1	14.6	0.0	11.4
Incr Delay (d2), s/veh	5.0	0.0	0.4	0.0	0.0	0.3	13.2	0.0	1.5	0.7	0.0	47.8
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(95%),veh/ln	6.4	0.0	2.0	0.2	0.0	1.4	2.6	0.0	13.3	1.0	0.0	34.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.1	0.0	20.9	21.6	0.0	20.5	55.8	0.0	17.6	15.4	0.0	59.2
LnGrp LOS	C	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	335			78			685			1279		
Approach Delay, s/veh	27.4			20.6			21.1			57.4		
Approach LOS	C			C			C			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	20.0			14.0			39.5			5.1		
Green Ext Time (p_c), s	10.9			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	41.5											
HCM 6th LOS	D											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	63	0	40	17	597	5	11	887	35
Future Volume (vph)	15	0	18	63	0	40	17	597	5	11	887	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1670	0	0	1640	0	0	1722	1648
Flt Permitted		0.762			0.804			0.970			0.992	
Satd. Flow (perm)	0	1326	1581	0	1384	0	0	1592	0	0	1710	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	108	0	0	651	0	0	946	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.7			45.0			45.0	45.0
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.08	0.07		0.44			0.54			0.74	0.03
Control Delay		22.1	1.7		18.8			8.2			4.1	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		22.1	1.7		18.8			8.2			4.1	0.1
LOS		C	A		B			A			A	A
Approach Delay		11.0			18.8			8.2			3.9	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		17			236			22	0
Queue Length 95th (ft)		19	4		55			207			m29	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		232	322		287			1195			1283	1248
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		0.07	0.06		0.38			0.54			0.74	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 6.6

Intersection LOS: A

Intersection Capacity Utilization 75.3%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	63	0	40	17	597	5	11	887	35
Future Volume (veh/h)	15	0	18	63	0	40	17	597	5	11	887	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	66	0	27	18	628	5	12	934	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	290	0	168	201	4	42	74	1206	9	66	1347	1216
Arrive On Green	0.09	0.00	0.11	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1607	0	1586	931	33	395	17	1638	13	7	1830	1652
Grp Volume(v), veh/h	16	0	11	93	0	0	651	0	0	946	0	36
Grp Sat Flow(s),veh/h/ln	1607	0	1586	1360	0	0	1668	0	0	1837	0	1652
Q Serve(g_s), s	0.0	0.0	0.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.4	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.71		0.29	0.03		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	263	0	168	223	0	0	1261	0	0	1382	0	1216
V/C Ratio(X)	0.06	0.00	0.07	0.42	0.00	0.00	0.52	0.00	0.00	0.68	0.00	0.03
Avail Cap(c_a), veh/h	355	0	278	324	0	0	1261	0	0	1382	0	1216
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	24.7	0.0	24.2	26.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.2	0.0	0.0	1.5	0.0	0.0	0.3	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(95%),veh/ln	0.4	0.0	0.3	2.4	0.0	0.0	1.0	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	24.3	27.7	0.0	0.0	1.5	0.0	0.0	0.3	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	27			93			651			982		
Approach Delay, s/veh	24.6			27.7			1.5			0.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.2			10.8			49.2			10.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.5			2.0			6.1		
Green Ext Time (p_c), s	20.5			0.0			30.1			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	294	61	23	310	138	97	291	18	226	363	300
Future Volume (vph)	225	294	61	23	310	138	97	291	18	226	363	300
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1810	0	1604	1640	1442
Flt Permitted	0.217			0.575			0.417			0.360		
Satd. Flow (perm)	363	1791	1435	915	1697	1577	668	1810	0	608	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		2				309
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1028				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	232	303	63	24	320	142	100	319	0	233	374	309
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	49.3	49.3	49.3	27.1	27.1	27.1	48.2	39.5		58.1	44.5	44.5
Actuated g/C Ratio	0.41	0.41	0.41	0.23	0.23	0.23	0.40	0.33		0.48	0.37	0.37
v/c Ratio	0.72	0.41	0.10	0.12	0.84	0.30	0.30	0.53		0.57	0.62	0.42
Control Delay	36.7	25.8	1.2	35.1	62.6	5.3	22.0	38.8		20.2	30.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	36.7	25.8	1.2	35.1	62.6	5.3	22.0	38.8		20.2	30.8	6.8
LOS	D	C	A	D	E	A	C	D		C	C	A
Approach Delay		27.4			44.5			34.8			20.0	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	120	162	0	15	238	0	41	202		101	185	38
Queue Length 95th (ft)	161	206	9	36	316	37	86	331		m156	#408	m79
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	327	932	795	301	558	625	334	597		411	607	728
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.71	0.33	0.08	0.08	0.57	0.23	0.30	0.53		0.57	0.62	0.42

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 29.3

Intersection LOS: C

Intersection Capacity Utilization 80.1%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4 (R)
23 s	45 s	20 s	32 s
 Ø6	 Ø7	 Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	294	61	23	310	138	97	291	18	226	363	300
Future Volume (veh/h)	225	294	61	23	310	138	97	291	18	226	363	300
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	232	303	33	24	320	0	100	300	18	233	374	238
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	317	695	594	258	363		401	719	43	486	682	578
Arrive On Green	0.13	0.38	0.38	0.21	0.21	0.00	0.06	0.36	0.35	0.15	0.55	0.55
Sat Flow, veh/h	1736	1823	1557	963	1766	1544	1880	2013	121	1616	1655	1402
Grp Volume(v), veh/h	232	303	33	24	320	0	100	0	318	233	374	238
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	963	1766	1544	1880	0	2134	1616	1655	1402
Q Serve(g_s), s	11.9	14.8	1.6	2.4	21.1	0.0	3.9	0.0	13.5	10.4	17.5	11.9
Cycle Q Clear(g_c), s	11.9	14.8	1.6	2.4	21.1	0.0	3.9	0.0	13.5	10.4	17.5	11.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	317	695	594	258	363		401	0	762	486	682	578
V/C Ratio(X)	0.73	0.44	0.06	0.09	0.88		0.25	0.00	0.42	0.48	0.55	0.41
Avail Cap(c_a), veh/h	344	950	811	377	581		429	0	762	488	682	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	27.5	23.5	38.8	46.2	0.0	22.1	0.0	29.2	18.5	19.9	18.6
Incr Delay (d2), s/veh	7.2	0.2	0.0	0.1	5.7	0.0	0.3	0.0	1.7	0.7	3.2	2.2
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(95%),veh/ln	9.2	10.3	1.1	1.0	14.6	0.0	3.2	0.0	11.8	6.5	10.4	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	27.7	23.5	38.9	52.0	0.0	22.4	0.0	30.8	19.2	23.0	20.8
LnGrp LOS	D	C	C	D	D		C	A	C	B	C	C
Approach Vol, veh/h	568				344				418			
Approach Delay, s/veh	32.0				51.1				28.8			
Approach LOS	C				D				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	21.1	30.2	19.9	48.8		51.3	13.2	55.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	14.4	23.6	12.9	15.5		17.3	6.4	20.0				
Green Ext Time (p_c), s	0.2	0.1	0.0	1.0		0.1	0.0	2.4				

Intersection Summary

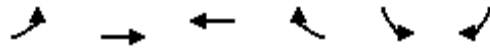
HCM 6th Ctrl Delay	30.3
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2031 No Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	494	425	58	39	1
Future Volume (vph)	6	494	425	58	39	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1763	0	1668	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1763	0	1668	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	515	503	0	42	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 36.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	494	425	58	39	1
Future Vol, veh/h	6	494	425	58	39	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	515	443	60	41	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	503	0	-	0	1000
Stage 1	-	-	-	-	473
Stage 2	-	-	-	-	527
Critical Hdwy	4.1	-	-	-	6.8
Critical Hdwy Stg 1	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	5.8
Follow-up Hdwy	3	-	-	-	3
Pot Cap-1 Maneuver	828	-	-	-	267
Stage 1	-	-	-	-	678
Stage 2	-	-	-	-	634
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	828	-	-	-	265
Mov Cap-2 Maneuver	-	-	-	-	419
Stage 1	-	-	-	-	673
Stage 2	-	-	-	-	634

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	828	-	-	-	422
HCM Lane V/C Ratio	0.008	-	-	-	0.099
HCM Control Delay (s)	9.4	-	-	-	14.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2031 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	84	79	4	53	57	34	268	6	88	322	49
Future Volume (vph)	80	84	79	4	53	57	34	268	6	88	322	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1397	0	0	1575	0	0	1667	0	0	1571	0
Flt Permitted		0.984			0.998			0.995			0.990	
Satd. Flow (perm)	0	1397	0	0	1575	0	0	1667	0	0	1571	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	253	0	0	118	0	0	320	0	0	478	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 67.4%	ICU Level of Service C											
Analysis Period (min) 15												

Intersection	
Intersection Delay, s/veh	26.3
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	80	84	79	4	53	57	34	268	6	88	322	49
Future Vol, veh/h	80	84	79	4	53	57	34	268	6	88	322	49
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	83	88	82	4	55	59	35	279	6	92	335	51
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.7	12.3	19	38.7
HCM LOS	C	B	C	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	33%	4%	19%
Vol Thru, %	87%	35%	46%	70%
Vol Right, %	2%	33%	50%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	308	243	114	459
LT Vol	34	80	4	88
Through Vol	268	84	53	322
RT Vol	6	79	57	49
Lane Flow Rate	321	253	119	478
Geometry Grp	1	1	1	1
Degree of Util (X)	0.592	0.527	0.233	0.868
Departure Headway (Hd)	6.642	7.502	7.054	6.536
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	542	478	506	555
Service Time	4.707	5.57	5.138	4.593
HCM Lane V/C Ratio	0.592	0.529	0.235	0.861
HCM Control Delay	19	18.7	12.3	38.7
HCM Lane LOS	C	C	B	E
HCM 95th-tile Q	3.8	3	0.9	9.6

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	636	85	135	541	92	130
Future Volume (vph)	636	85	135	541	92	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1835	0	1761	1958	1577	0
Flt Permitted			0.204		0.980	
Satd. Flow (perm)	1835	0	378	1958	1577	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	8					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	728	0	136	546	224	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	62.2		76.0	74.8	24.8	
Actuated g/C Ratio	0.57		0.69	0.68	0.23	
v/c Ratio	0.70		0.37	0.41	0.63	
Control Delay	23.1		7.8	8.9	45.9	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	23.1		7.8	8.9	45.9	
LOS	C		A	A	D	
Approach Delay	23.1			8.7	45.9	
Approach LOS	C			A	D	
Queue Length 50th (ft)	349		32	171	144	
Queue Length 95th (ft)	582		m50	m256	207	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1040		374	1331	570	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.70		0.36	0.41	0.39	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 20.2

Intersection LOS: C

Intersection Capacity Utilization 74.5%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230

↙ Ø1	→ Ø2 (R)	↖ Ø4
13 s	52 s	45 s
↖ Ø6 (R)		
65 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2031 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	636	85	135	541	92	130
Future Volume (veh/h)	636	85	135	541	92	130
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	642	84	136	546	93	131
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	975	128	465	1522	122	172
Arrive On Green	0.64	0.63	0.05	0.73	0.18	0.17
Sat Flow, veh/h	1529	200	1927	2090	688	970
Grp Volume(v), veh/h	0	726	136	546	225	0
Grp Sat Flow(s),veh/h/ln	0	1729	1927	2090	1666	0
Q Serve(g_s), s	0.0	28.9	2.4	10.6	14.2	0.0
Cycle Q Clear(g_c), s	0.0	28.9	2.4	10.6	14.2	0.0
Prop In Lane		0.12	1.00		0.41	0.58
Lane Grp Cap(c), veh/h	0	1103	465	1522	295	0
V/C Ratio(X)	0.00	0.66	0.29	0.36	0.76	0.00
Avail Cap(c_a), veh/h	0	1103	519	1522	603	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.5	10.2	5.5	43.3	0.0
Incr Delay (d2), s/veh	0.0	3.1	0.3	0.7	13.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	16.4	1.7	7.4	11.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	15.5	10.6	6.2	57.0	0.0
LnGrp LOS	A	B	B	A	E	A
Approach Vol, veh/h	726			682	225	
Approach Delay, s/veh	15.5			7.0	57.0	
Approach LOS	B			A	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.9	75.4		24.7		85.3
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	4.4	30.9		16.2		12.6
Green Ext Time (p_c), s	0.1	10.7		2.3		16.5
Intersection Summary						
HCM 6th Ctrl Delay			17.7			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	827	0	1	846	104	0	0	1	50	0	37
Future Volume (vph)	17	827	0	1	846	104	0	0	1	50	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	861	0	1	989	0	0	1	0	52	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 66.9% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	827	0	1	846	104	0	0	1	50	0	37
Future Vol, veh/h	17	827	0	1	846	104	0	0	1	50	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	861	0	1	881	108	0	0	1	52	0	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	989	0	0	861	0	0	1854	1888	861	1835	1834	935
Stage 1	-	-	-	-	-	-	897	897	-	937	937	-
Stage 2	-	-	-	-	-	-	957	991	-	898	897	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	637	-	-	451	-	-	75	88	392	85	104	365
Stage 1	-	-	-	-	-	-	412	399	-	413	405	-
Stage 2	-	-	-	-	-	-	383	365	-	432	419	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	637	-	-	451	-	-	66	85	392	83	101	365
Mov Cap-2 Maneuver	-	-	-	-	-	-	66	85	-	83	101	-
Stage 1	-	-	-	-	-	-	400	388	-	401	404	-
Stage 2	-	-	-	-	-	-	342	364	-	419	407	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	14.2	66.2
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	392	637	-	-	451	-	-	83	365
HCM Lane V/C Ratio	0.003	0.028	-	-	0.002	-	-	0.628	0.106
HCM Control Delay (s)	14.2	10.8	-	-	13	-	-	103.4	16
HCM Lane LOS	B	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	2.9	0.4

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	584	51	158	680	16	265	3	166	36	4	15
Future Volume (vph)	22	584	51	158	680	16	265	3	166	36	4	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1740	0
Flt Permitted	0.375			0.259			0.744			0.533		
Satd. Flow (perm)	652	1783	1584	429	1697	1573	1327	1574	0	988	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			175			16
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	615	54	166	716	17	279	178	0	38	20	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	58.7	58.7	58.7	75.3	74.0	74.0	25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.53	0.53	0.53	0.68	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.07	0.65	0.06	0.41	0.63	0.02	0.92	0.36		0.17	0.05	
Control Delay	14.7	18.5	2.7	8.4	9.6	1.1	76.4	7.6		35.7	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.7	18.5	2.7	8.4	9.6	1.1	76.4	7.6		35.7	16.9	
LOS	B	B	A	A	A	A	E	A		D	B	
Approach Delay		17.1			9.2			49.6			29.2	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	6	176	0	28	157	0	191	2		21	2	
Queue Length 95th (ft)	m15	310	m6	52	235	m1	#346	57		51	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	347	951	884	475	1142	1068	314	506		234	425	
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	0.07	0.65	0.06	0.35	0.63	0.02	0.89	0.35		0.16	0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 21.1

Intersection LOS: C

Intersection Capacity Utilization 86.9%

ICU Level of Service E

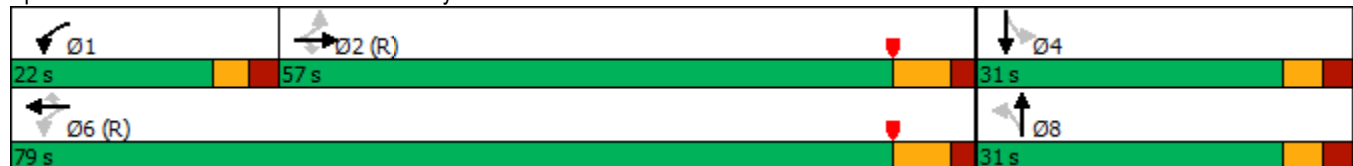
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2031 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	584	51	158	680	16	265	3	166	36	4	15
Future Volume (veh/h)	22	584	51	158	680	16	265	3	166	36	4	15
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	615	32	166	716	12	279	3	110	38	4	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	523	1171	997	605	1190	1056	387	10	358	294	125	282
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.22	0.22	0.21	0.22	0.22	0.21
Sat Flow, veh/h	800	2047	1743	1666	1736	1540	1488	45	1645	1385	576	1296
Grp Volume(v), veh/h	23	615	32	166	716	12	279	0	113	38	0	13
Grp Sat Flow(s),veh/h/ln	800	2047	1743	1666	1736	1540	1488	0	1690	1385	0	1871
Q Serve(g_s), s	0.0	0.0	0.0	4.2	0.0	0.0	19.9	0.0	6.2	2.6	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.2	0.0	0.0	20.0	0.0	6.2	8.3	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.69
Lane Grp Cap(c), veh/h	523	1171	997	605	1190	1056	387	0	367	294	0	407
V/C Ratio(X)	0.04	0.53	0.03	0.27	0.60	0.01	0.72	0.00	0.31	0.13	0.00	0.03
Avail Cap(c_a), veh/h	523	1171	997	750	1190	1056	417	0	401	322	0	444
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)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.3	0.0	0.0	41.6	0.0	36.5	39.4	0.0	34.2
Incr Delay (d2), s/veh	0.2	1.7	0.1	0.2	1.8	0.0	5.5	0.0	0.5	0.2	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(95%),veh/ln	0.0	1.0	0.0	2.1	1.1	0.0	12.5	0.0	4.8	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	1.7	0.1	6.5	1.8	0.0	47.1	0.0	37.0	39.6	0.0	34.2
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	670			894			392			51		
Approach Delay, s/veh	1.6			2.6			44.2			38.2		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	12.5	68.7	28.8		81.2		28.8					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25		72.2		* 25					
Max Q Clear Time (g_c+I1), s	6.7	2.5	10.8		2.5		22.5					
Green Ext Time (p_c), s	0.3	0.7	0.1		0.9		0.4					

Intersection Summary

HCM 6th Ctrl Delay 11.3
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	529	13	4	662	69	9	3	11	63	40	132
Future Volume (vph)	111	529	13	4	662	69	9	3	11	63	40	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1740	0	1744	1818	1561	0	1759	0	1719	1574	0
Flt Permitted	0.286			0.445				0.595		0.741		
Satd. Flow (perm)	505	1740	0	817	1818	1561	0	1067	0	1340	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		12			137	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	583	0	4	712	74	0	25	0	68	185	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.7	87.8		75.1	75.1	75.1		12.2		12.2	12.2	
Actuated g/C Ratio	0.81	0.80		0.68	0.68	0.68		0.11		0.11	0.11	
v/c Ratio	0.24	0.42		0.01	0.57	0.07		0.20		0.46	0.63	
Control Delay	4.2	5.2		6.5	13.3	1.8		31.2		54.7	23.6	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.2	5.2		6.5	13.5	1.8		31.2		54.7	23.6	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		5.0			12.4			31.2			32.0	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	17	97		1	294	2		8		46	32	
Queue Length 95th (ft)	m31	190		m3	477	8		33		87	99	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	508	1390		558	1241	1091		236		285	442	
Starvation Cap Reductn	0	0		0	110	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	0.23	0.42		0.01	0.63	0.07		0.11		0.24	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 12.5

Intersection LOS: B

Intersection Capacity Utilization 66.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary 10: Driveway/Market Sq Dr & SR 0230

2031 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	529	13	4	662	69	9	3	11	63	40	132
Future Volume (veh/h)	111	529	13	4	662	69	9	3	11	63	40	132
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	119	569	12	4	712	61	10	3	8	68	43	71
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	604	1342	28	692	1395	1191	65	28	28	191	61	101
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09
Sat Flow, veh/h	1629	1655	35	868	1935	1652	172	283	280	1374	621	1025
Grp Volume(v), veh/h	119	0	581	4	712	61	21	0	0	68	0	114
Grp Sat Flow(s),veh/h/ln	1629	0	1690	868	1935	1652	735	0	0	1374	0	1646
Q Serve(g_s), s	1.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.4
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	5.8	0.0	7.4
Prop In Lane	1.00		0.02	1.00		1.00	0.48		0.38	1.00		0.62
Lane Grp Cap(c), veh/h	604	0	1370	692	1395	1191	114	0	0	191	0	162
V/C Ratio(X)	0.20	0.00	0.42	0.01	0.51	0.05	0.18	0.00	0.00	0.36	0.00	0.70
Avail Cap(c_a), veh/h	666	0	1370	692	1395	1191	279	0	0	348	0	350
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)	0.75	0.00	0.75	0.88	0.88	0.88	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.5	0.0	0.0	0.0	0.0	0.0	45.8	0.0	0.0	47.3	0.0	48.3
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.2	0.1	0.8	0.0	0.0	1.1	0.0	5.4
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(95%),veh/ln	0.7	0.0	0.5	0.0	0.8	0.0	1.0	0.0	0.0	3.3	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.6	0.0	0.7	0.0	1.2	0.1	46.5	0.0	0.0	48.4	0.0	53.8
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	700		777				21		182			
Approach Delay, s/veh	1.0		1.1				46.5		51.8			
Approach LOS	A		A				D		D			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.8	84.7	15.4		94.6		15.4					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.4	2.5	9.4		2.5		9.5					
Green Ext Time (p_c), s	0.1	1.0	0.5		0.7		0.0					
Intersection Summary												
HCM 6th Ctrl Delay			7.1									
HCM 6th LOS			A									

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	505	24	21	540	14	69	24	18	16	21	77
Future Volume (vph)	56	505	24	21	540	14	69	24	18	16	21	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1744	0	1620	1698	0	1541	1658	0	0	1823	0
Flt Permitted	0.411			0.425			0.528				0.951	
Satd. Flow (perm)	714	1744	0	725	1698	0	857	1658	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			19			81	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	557	0	22	583	0	73	44	0	0	120	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.3	86.3		86.3	86.3		13.8	13.8			13.8	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.13	0.13			0.13	
v/c Ratio	0.11	0.41		0.04	0.44		0.68	0.20			0.41	
Control Delay	5.5	6.8		3.8	5.7		74.7	28.5			20.4	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0			0.0	
Total Delay	5.5	6.9		3.8	5.7		74.7	28.5			20.4	
LOS	A	A		A	A		E	C			C	
Approach Delay		6.8			5.6			57.3			20.4	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	12	154		3	109		50	16			25	
Queue Length 95th (ft)	30	209		11	213		96	46			75	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	560	1368		568	1332		319	629			701	
Starvation Cap Reductn	0	184		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	25		0	0			1	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.11	0.47		0.04	0.45		0.23	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 11.5

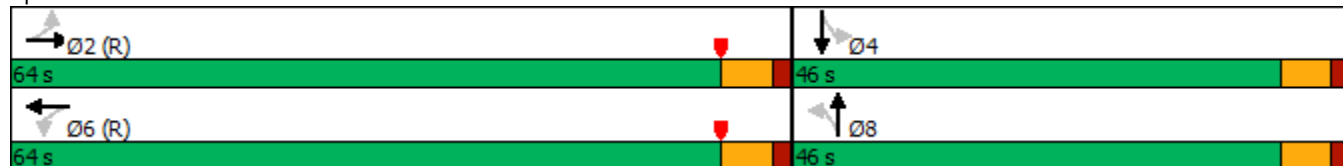
Intersection LOS: B

Intersection Capacity Utilization 69.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2031 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	505	24	21	540	14	69	24	18	16	21	77
Future Volume (veh/h)	56	505	24	21	540	14	69	24	18	16	21	77
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	59	532	20	22	568	14	73	25	7	17	22	34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	644	1380	52	792	1543	38	174	105	29	63	53	66
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	766	1662	62	875	1858	46	1240	1315	368	280	670	828
Grp Volume(v), veh/h	59	0	552	22	0	582	73	0	32	73	0	0
Grp Sat Flow(s),veh/h/ln	766	0	1724	875	0	1904	1240	0	1683	1778	0	0
Q Serve(g_s), s	0.8	0.0	0.0	0.5	0.0	8.2	1.2	0.0	2.0	1.9	0.0	0.0
Cycle Q Clear(g_c), s	9.1	0.0	0.0	0.5	0.0	8.2	5.4	0.0	2.0	4.3	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	1.00		0.22	0.23		0.47
Lane Grp Cap(c), veh/h	644	0	1432	792	0	1581	174	0	134	166	0	0
V/C Ratio(X)	0.09	0.00	0.39	0.03	0.00	0.37	0.42	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	644	0	1432	792	0	1581	537	0	627	675	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)	0.91	0.00	0.91	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	1.6	0.0	2.3	49.0	0.0	47.6	48.9	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.7	0.1	0.0	0.7	1.6	0.0	0.9	1.8	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	3.3	3.6	0.0	1.5	3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.7	0.0	0.7	1.7	0.0	2.9	50.6	0.0	48.5	50.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	611			604			105			73		
Approach Delay, s/veh	0.7			2.9			50.0			50.7		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.2			13.8			96.2			13.8		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.3			10.2			7.4		
Green Ext Time (p_c), s	20.3			0.2			21.2			0.3		

Intersection Summary

HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A

Notes

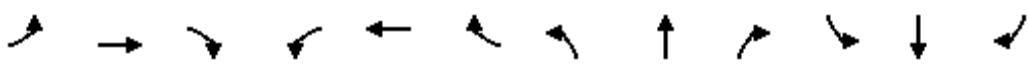
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	350	1	61	213	117	0	0	132	28
Future Volume (vph)	0	0	0	350	1	61	213	117	0	0	132	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1642	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.953		0.496					
Satd. Flow (perm)	0	0	0	0	1642	1442	822	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	366	64	222	122	0	0	138	29
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.8	16.8	27.3	27.3			14.2	14.2
Actuated g/C Ratio					0.31	0.31	0.51	0.51			0.26	0.26
v/c Ratio					0.71	0.11	0.42	0.15			0.30	0.05
Control Delay					25.1	0.4	11.1	8.5			18.8	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					25.1	0.4	11.1	8.5			18.8	0.2
LOS					C	A	B	A			B	A
Approach Delay					21.5			10.2			15.6	
Approach LOS					C			B			B	
Queue Length 50th (ft)					98	0	38	20			36	0
Queue Length 95th (ft)					192	0	81	46			78	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					631	655	531	923			555	609
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					0.58	0.10	0.42	0.13			0.25	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 53.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 16.3

Intersection LOS: B

Intersection Capacity Utilization 56.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶	↷			↷	↶
Traffic Volume (veh/h)	0	0	0	350	1	61	213	117	0	0	132	28
Future Volume (veh/h)	0	0	0	350	1	61	213	117	0	0	132	28
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				365	1	0	222	122	0	0	138	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				488	1		649	905	0	0	500	
Arrive On Green				0.25	0.27	0.00	0.16	0.53	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1781	5	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				366	0	0	222	122	0	0	138	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				9.1	0.0	0.0	4.0	1.8	0.0	0.0	2.8	0.0
Cycle Q Clear(g_c), s				9.1	0.0	0.0	4.0	1.8	0.0	0.0	2.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				489	0		649	905	0	0	500	
V/C Ratio(X)				0.75	0.00		0.34	0.13	0.00	0.00	0.28	
Avail Cap(c_a), veh/h				756	0		661	1058	0	0	653	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.5	0.0	0.0	8.2	5.8	0.0	0.0	14.0	0.0
Incr Delay (d2), s/veh				2.3	0.0	0.0	0.3	0.2	0.0	0.0	1.1	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
%ile BackOfQ(95%),veh/ln				6.7	0.0	0.0	1.8	0.8	0.0	0.0	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.9	0.0	0.0	8.5	6.0	0.0	0.0	15.1	0.0
LnGrp LOS				B	A		A	A	A	A	B	
Approach Vol, veh/h					366			344			138	
Approach Delay, s/veh					18.9			7.6			15.1	
Approach LOS					B			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		30.6			12.6	18.0		17.8				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		3.8			6.0	4.8		11.1				
Green Ext Time (p_c), s		2.3			0.1	1.6		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.7								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	216	0	0	0	0	298	359	90	395	0
Future Volume (vph)	24	0	216	0	0	0	0	298	359	90	395	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	232	0	0	0	0	706	0	97	425	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 56.0% ICU Level of Service B

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2031 No Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	24	0	216	0	0	0	0	298	359	90	395	0
Future Vol, veh/h	24	0	216	0	0	0	0	298	359	90	395	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	26	0	232	0	0	0	0	320	386	97	425	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	939	939	425	-	0	0	320	0	0
Stage 1	619	619	-	-	-	-	-	-	-
Stage 2	320	320	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	303	311	689	0	-	-	967	-	0
Stage 1	642	536	-	0	-	-	-	-	0
Stage 2	857	692	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	273	0	689	-	-	-	967	-	-
Mov Cap-2 Maneuver	273	0	-	-	-	-	-	-	-
Stage 1	642	0	-	-	-	-	-	-	-
Stage 2	771	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	273	689	967	-
HCM Lane V/C Ratio	-	-	0.095	0.337	0.1	-
HCM Control Delay (s)	-	-	19.6	12.9	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	1.5	0.3	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 No Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	12	14	629	627	3
Future Volume (vph)	6	12	14	629	627	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1557	0	0	1800	1796	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1557	0	0	1800	1796	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	0	684	670	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	54.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 No Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	12	14	629	627	3
Future Vol, veh/h	6	12	14	629	627	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	13	15	669	667	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1368	669	670	0	-	0
Stage 1	669	-	-	-	-	-
Stage 2	699	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	160	483	758	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	155	483	758	-	-	-
Mov Cap-2 Maneuver	155	-	-	-	-	-
Stage 1	514	-	-	-	-	-
Stage 2	512	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.6	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	758	-	283	-	-
HCM Lane V/C Ratio	0.02	-	0.068	-	-
HCM Control Delay (s)	9.8	0	18.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	24	55	12	22	34	31	464	8	20	442	187
Future Volume (vph)	157	24	55	12	22	34	31	464	8	20	442	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1683	0	1572	1634	0	1620	1712	0	1550	1683	0
Flt Permitted	0.719			0.703			0.335			0.446		
Satd. Flow (perm)	1226	1683	0	1163	1634	0	571	1712	0	728	1683	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		58			36			2			60	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	165	83	0	13	59	0	33	496	0	21	662	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.9	12.9		12.5	12.5		40.4	40.4		40.4	40.4	
Actuated g/C Ratio	0.22	0.22		0.21	0.21		0.67	0.67		0.67	0.67	
v/c Ratio	0.63	0.20		0.05	0.16		0.09	0.43		0.04	0.57	
Control Delay	32.1	9.7		17.9	10.9		5.5	8.1		5.9	9.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	32.1	9.7		17.9	10.9		5.5	8.1		5.9	9.5	
LOS	C	A		B	B		A	A		A	A	
Approach Delay		24.6			12.2			8.0			9.4	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)	53	7		4	6		4	91		3	125	
Queue Length 95th (ft)	106	35		15	30		m15	208		11	235	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	464		290	435		384	1153		490	1152	
Starvation Cap Reductn	0	0		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	0.54	0.18		0.04	0.14		0.09	0.43		0.04	0.57	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 11.5

Intersection LOS: B

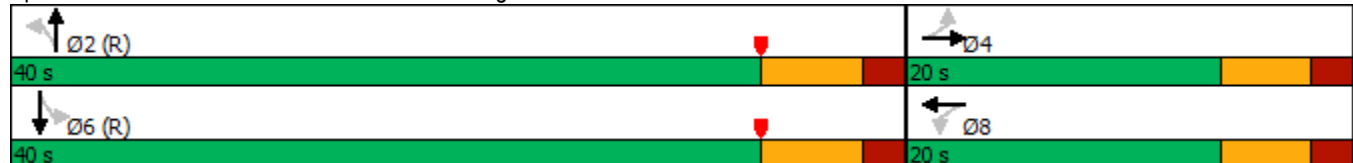
Intersection Capacity Utilization 61.2%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2031 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	24	55	12	22	34	31	464	8	20	442	187
Future Volume (veh/h)	157	24	55	12	22	34	31	464	8	20	442	187
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	165	25	31	13	23	22	33	488	7	21	465	163
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	352	155	192	320	158	151	490	1178	17	492	877	307
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.21	0.21	0.21	0.64	0.64	0.62
Sat Flow, veh/h	1435	839	1040	1261	855	818	815	1838	26	906	1369	480
Grp Volume(v), veh/h	165	0	56	13	0	45	33	0	495	21	0	628
Grp Sat Flow(s),veh/h/ln	1435	0	1879	1261	0	1673	815	0	1864	906	0	1848
Q Serve(g_s), s	6.5	0.0	1.5	0.5	0.0	1.4	2.1	0.0	13.8	0.8	0.0	11.2
Cycle Q Clear(g_c), s	7.9	0.0	1.5	2.0	0.0	1.4	13.3	0.0	13.8	14.6	0.0	11.2
Prop In Lane	1.00		0.55	1.00		0.49	1.00		0.01	1.00		0.26
Lane Grp Cap(c), veh/h	352	0	346	320	0	308	490	0	1194	492	0	1184
V/C Ratio(X)	0.47	0.00	0.16	0.04	0.00	0.15	0.07	0.00	0.41	0.04	0.00	0.53
Avail Cap(c_a), veh/h	446	0	470	403	0	418	490	0	1194	492	0	1184
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.93	0.00	0.93	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	20.8	21.4	0.0	20.7	18.6	0.0	13.9	10.6	0.0	6.0
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.1	0.0	0.2	0.2	0.0	1.0	0.2	0.0	1.7
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(95%),veh/ln	3.8	0.0	1.1	0.3	0.0	0.9	0.8	0.0	11.0	0.3	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	21.0	21.5	0.0	20.9	18.8	0.0	14.9	10.8	0.0	7.7
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	A
Approach Vol, veh/h	221			58			528			649		
Approach Delay, s/veh	23.8			21.1			15.2			7.8		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.9			16.1			43.9			16.1		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	15.8			9.9			13.2			4.0		
Green Ext Time (p_c), s	9.5			0.3			13.3			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	13.4											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	13	24	0	7	16	494	7	12	514	7
Future Volume (vph)	5	1	13	24	0	7	16	494	7	12	514	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1696	0	0	1668	0	0	1722	1648
Flt Permitted					0.990			0.981			0.987	
Satd. Flow (perm)	0	1740	1581	0	1746	0	0	1639	0	0	1701	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	14	0	32	0	0	544	0	0	554	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.13			0.37			0.37	0.00
Control Delay		23.5	0.5		5.2			3.0			1.5	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.5		5.2			3.0			1.5	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.4			5.2			3.0			1.5	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		13			112			13	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		379			1453			1507	1466
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		0.02	0.04		0.08			0.37			0.37	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 2.4

Intersection LOS: A

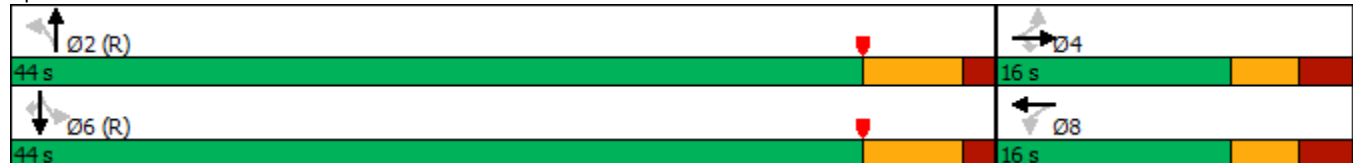
Intersection Capacity Utilization 58.0%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	13	24	0	7	16	494	7	12	514	7
Future Volume (veh/h)	5	1	13	24	0	7	16	494	7	12	514	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	7	25	0	3	17	520	7	13	541	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	172	12	71	164	0	6	77	1330	18	71	1450	1317
Arrive On Green	0.03	0.04	0.04	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1393	279	1586	1121	0	134	19	1668	22	13	1819	1652
Grp Volume(v), veh/h	6	0	7	28	0	0	544	0	0	554	0	7
Grp Sat Flow(s),veh/h/ln	1672	0	1586	1255	0	0	1709	0	0	1832	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.3	1.4	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.89		0.11	0.03		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	157	0	71	149	0	0	1396	0	0	1491	0	1317
V/C Ratio(X)	0.04	0.00	0.10	0.19	0.00	0.00	0.39	0.00	0.00	0.37	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1396	0	0	1491	0	1317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.80	0.00	0.80
Uniform Delay (d), s/veh	27.9	0.0	27.5	28.6	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.6	0.0	0.0	0.8	0.0	0.0	0.6	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(95%),veh/ln	0.2	0.0	0.2	0.8	0.0	0.0	1.0	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	28.1	29.2	0.0	0.0	2.6	0.0	0.0	0.6	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	13			28			544			561		
Approach Delay, s/veh	28.0			29.2			2.6			0.6		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	52.8			7.2			52.8			7.2		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	7.7			2.3			2.0			3.4		
Green Ext Time (p_c), s	14.7			0.0			16.6			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	2.6											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	300	57	27	322	140	73	170	15	131	179	187
Future Volume (vph)	210	300	57	27	322	140	73	170	15	131	179	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1845	0	1558	1624	1499
Flt Permitted	0.276			0.574			0.641			0.619		
Satd. Flow (perm)	457	1809	1435	923	1731	1592	1171	1845	0	1015	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		5				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	214	306	58	28	329	143	74	188	0	134	183	191
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	30.6	30.6	30.6	16.6	16.6	16.6	19.2	13.3		19.4	13.4	13.4
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.29	0.20		0.29	0.20	0.20
v/c Ratio	0.61	0.37	0.08	0.12	0.76	0.24	0.18	0.50		0.37	0.56	0.38
Control Delay	23.0	15.1	0.2	23.2	38.1	1.0	14.8	29.3		17.5	32.3	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	23.0	15.1	0.2	23.2	38.1	1.0	14.8	29.3		17.5	32.3	3.9
LOS	C	B	A	C	D	A	B	C		B	C	A
Approach Delay		16.5			26.6			25.2			17.7	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	58	86	0	9	133	0	20	72		38	73	0
Queue Length 95th (ft)	#129	156	0	30	#265	0	44	131		73	133	25
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	350	903	797	266	499	640	411	507		364	443	589
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.61	0.34	0.07	0.11	0.66	0.22	0.18	0.37		0.37	0.41	0.32

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 66.2

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 20.8

Intersection LOS: C

Intersection Capacity Utilization 67.4%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	300	57	27	322	140	73	170	15	131	179	187
Future Volume (veh/h)	210	300	57	27	322	140	73	170	15	131	179	187
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	214	306	52	28	329	0	74	173	12	134	183	109
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	408	837	709	340	415		366	280	19	372	307	271
Arrive On Green	0.13	0.46	0.46	0.23	0.23	0.00	0.07	0.14	0.12	0.12	0.19	0.19
Sat Flow, veh/h	1723	1837	1557	951	1794	1557	2069	2020	140	1576	1641	1450
Grp Volume(v), veh/h	214	306	52	28	329	0	74	0	185	134	183	109
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	951	1794	1557	2069	0	2160	1576	1641	1450
Q Serve(g_s), s	5.1	6.6	1.1	1.4	10.4	0.0	1.8	0.0	4.9	4.2	6.2	4.0
Cycle Q Clear(g_c), s	5.1	6.6	1.1	1.4	10.4	0.0	1.8	0.0	4.9	4.2	6.2	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	408	837	709	340	415		366	0	299	372	307	271
V/C Ratio(X)	0.52	0.37	0.07	0.08	0.79		0.20	0.00	0.62	0.36	0.60	0.40
Avail Cap(c_a), veh/h	408	975	826	411	551		501	0	627	399	476	421
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	10.7	9.3	18.3	21.8	0.0	19.8	0.0	24.5	18.5	22.4	21.6
Incr Delay (d2), s/veh	1.2	0.1	0.0	0.0	4.1	0.0	0.3	0.0	2.1	0.6	1.9	1.0
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(95%),veh/ln	3.0	3.7	0.6	0.5	7.6	0.0	1.5	0.0	4.6	2.5	4.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.1	10.8	9.3	18.4	25.9	0.0	20.1	0.0	26.6	19.1	24.3	22.5
LnGrp LOS	B	B	A	B	C		C	A	C	B	C	C
Approach Vol, veh/h	572			357			259			426		
Approach Delay, s/veh	12.3			25.3			24.7			22.2		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	19.5	13.0	14.4		33.0	10.1	17.3				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	7.6	12.9	6.7	6.9		9.1	4.3	8.7				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.5		0.1	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	19.8
HCM 6th LOS	B

Notes

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

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2031 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	51	34	16	34	49	20	182	7	25	185	35
Future Volume (vph)	39	51	34	16	34	49	20	182	7	25	185	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1679	0	0	1633	0	0	1772	0	0	1849	0
Flt Permitted		0.984			0.992			0.995			0.995	
Satd. Flow (perm)	0	1679	0	0	1633	0	0	1772	0	0	1849	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	0	103	0	0	218	0	0	255	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.8%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

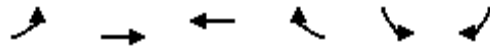
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	39	51	34	16	34	49	20	182	7	25	185	35
Future Vol, veh/h	39	51	34	16	34	49	20	182	7	25	185	35
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	41	53	35	17	35	51	21	190	7	26	193	36
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.5	8.8	10	10.1
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	31%	16%	10%
Vol Thru, %	87%	41%	34%	76%
Vol Right, %	3%	27%	49%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	209	124	99	245
LT Vol	20	39	16	25
Through Vol	182	51	34	185
RT Vol	7	34	49	35
Lane Flow Rate	218	129	103	255
Geometry Grp	1	1	1	1
Degree of Util (X)	0.295	0.186	0.141	0.332
Departure Headway (Hd)	4.872	5.186	4.934	4.687
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	732	686	719	761
Service Time	2.94	3.265	3.016	2.752
HCM Lane V/C Ratio	0.298	0.188	0.143	0.335
HCM Control Delay	10	9.5	8.8	10.1
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	1.2	0.7	0.5	1.5

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2031 No Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	403	439	35	33	3
Future Volume (vph)	3	403	439	35	33	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1793	0	1660	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1793	0	1660	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	420	493	0	37	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.2% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	403	439	35	33	3
Future Vol, veh/h	3	403	439	35	33	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	420	457	36	34	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	493	0	-	0	901	475
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	426	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	835	-	-	-	311	608
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	718	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	835	-	-	-	310	608
Mov Cap-2 Maneuver	-	-	-	-	458	-
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	718	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.4		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	835	-	-	-	468	
HCM Lane V/C Ratio	0.004	-	-	-	0.08	
HCM Control Delay (s)	9.3	-	-	-	13.4	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

APPENDIX L12

2031 BUILD CONDITION ANALYSES

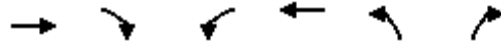
Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	455	81	90	397	148	155
Future Volume (vph)	455	81	90	397	148	155
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1685	0	1662	1766	1532	0
Flt Permitted			0.206		0.976	
Satd. Flow (perm)	1685	0	360	1766	1532	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	16					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	596	0	100	441	336	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.4		42.2	41.0	18.6	
Actuated g/C Ratio	0.45		0.60	0.59	0.27	
v/c Ratio	0.78		0.28	0.43	0.83	
Control Delay	26.7		5.8	6.6	43.4	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	26.7		5.8	6.6	43.4	
LOS	C		A	A	D	
Approach Delay	26.7			6.5	43.4	
Approach LOS	C			A	D	
Queue Length 50th (ft)	218		12	60	135	
Queue Length 95th (ft)	#406		m23	84	#267	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 Build
AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	764		365	1033	411	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.78		0.27	0.43	0.82	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 23.1

Intersection LOS: C

Intersection Capacity Utilization 66.5%

ICU Level of Service C

Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2031 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	455	81	90	397	148	155
Future Volume (veh/h)	455	81	90	397	148	155
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	506	84	100	441	164	172
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	648	108	381	1162	196	206
Arrive On Green	0.47	0.46	0.15	1.00	0.25	0.23
Sat Flow, veh/h	1378	229	1846	1927	791	829
Grp Volume(v), veh/h	0	590	100	441	337	0
Grp Sat Flow(s),veh/h/ln	0	1607	1846	1927	1625	0
Q Serve(g_s), s	0.0	21.5	1.7	0.0	13.8	0.0
Cycle Q Clear(g_c), s	0.0	21.5	1.7	0.0	13.8	0.0
Prop In Lane		0.14	1.00		0.49	0.51
Lane Grp Cap(c), veh/h	0	756	381	1162	404	0
V/C Ratio(X)	0.00	0.78	0.26	0.38	0.83	0.00
Avail Cap(c_a), veh/h	0	756	453	1162	436	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	15.6	10.2	0.0	25.2	0.0
Incr Delay (d2), s/veh	0.0	7.9	0.4	0.9	16.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	13.1	1.0	0.5	11.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	23.4	10.6	0.9	41.8	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	590			541	337	
Approach Delay, s/veh	23.4			2.7	41.8	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.3	38.1		22.6		47.4
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.7	23.5		15.8		2.0
Green Ext Time (p_c), s	0.1	3.0		0.6		11.6
Intersection Summary						
HCM 6th Ctrl Delay			20.0			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	639	1	0	585	46	0	0	2	47	0	36
Future Volume (vph)	26	639	1	0	585	46	0	0	2	47	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1615	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	719	0	0	709	0	0	2	0	53	40	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 49.8%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	639	1	0	585	46	0	0	2	47	0	36
Future Vol, veh/h	26	639	1	0	585	46	0	0	2	47	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	29	718	1	0	657	52	0	0	2	53	0	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	709	0	0	719	0	0	1481	1486	720	1462	1460	684
Stage 1	-	-	-	-	-	-	777	777	-	683	683	-
Stage 2	-	-	-	-	-	-	704	709	-	779	777	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	720	-	-	532	-	-	133	148	382	148	166	445
Stage 1	-	-	-	-	-	-	476	447	-	554	507	-
Stage 2	-	-	-	-	-	-	520	476	-	496	467	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	720	-	-	532	-	-	117	142	382	143	159	445
Mov Cap-2 Maneuver	-	-	-	-	-	-	117	142	-	143	159	-
Stage 1	-	-	-	-	-	-	457	429	-	532	507	-
Stage 2	-	-	-	-	-	-	472	476	-	473	448	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	14.5	31.1
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	382	720	-	-	532	-	-	143	445
HCM Lane V/C Ratio	0.006	0.041	-	-	-	-	-	0.369	0.091
HCM Control Delay (s)	14.5	10.2	-	-	0	-	-	44.2	13.9
HCM Lane LOS	B	B	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1.5	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	553	45	64	517	6	106	2	74	4	3	2
Future Volume (vph)	3	553	45	64	517	6	106	2	74	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.448			0.283			0.754			0.702		
Satd. Flow (perm)	779	1667	1552	459	1558	1608	1302	1516	0	1302	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45			82			2
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	614	50	71	574	7	118	84	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	42.2	42.2	42.2	52.2	52.1	52.1	10.9	10.9		10.7	10.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.75	0.74	0.74	0.16	0.16		0.15	0.15	
v/c Ratio	0.01	0.61	0.05	0.15	0.50	0.01	0.58	0.28		0.02	0.02	
Control Delay	6.7	9.8	0.1	1.6	3.3	0.0	39.4	9.7		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	9.8	0.1	1.6	3.3	0.0	39.4	9.7		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		9.1			3.1			27.1			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	93	0	7	64	0	47	1		1	1	
Queue Length 95th (ft)	m1	m124	m0	1	12	m0	96	35		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	469	1005	988	473	1159	1207	225	329		225	320	
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	0.01	0.61	0.05	0.15	0.50	0.01	0.52	0.26		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 9.0

Intersection LOS: A

Intersection Capacity Utilization 67.8%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	553	45	64	517	6	106	2	74	4	3	2
Future Volume (veh/h)	3	553	45	64	517	6	106	2	74	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	614	34	71	574	6	118	2	44	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	660	1180	1044	625	1162	1114	285	9	202	260	147	98
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	919	1947	1722	1640	1609	1542	1461	73	1614	1466	1176	784
Grp Volume(v), veh/h	3	614	34	71	574	6	118	0	46	4	0	5
Grp Sat Flow(s),veh/h/ln	919	1947	1722	1640	1609	1542	1461	0	1687	1466	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	5.4	0.0	1.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.0	0.0	0.0	5.4	0.0	1.7	1.4	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	660	1180	1044	625	1162	1114	285	0	211	260	0	245
V/C Ratio(X)	0.00	0.52	0.03	0.11	0.49	0.01	0.41	0.00	0.22	0.02	0.00	0.02
Avail Cap(c_a), veh/h	660	1180	1044	739	1162	1114	355	0	292	330	0	339
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(l)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.3	0.0	0.0	29.2	0.0	28.0	28.0	0.0	27.0
Incr Delay (d2), s/veh	0.0	1.6	0.1	0.1	1.4	0.0	1.0	0.0	0.5	0.0	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(95%),veh/ln	0.0	1.0	0.0	0.3	0.8	0.0	3.5	0.0	1.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.6	0.1	3.4	1.4	0.0	30.1	0.0	28.5	28.0	0.0	27.1
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	651		651				164		9			
Approach Delay, s/veh	1.6		1.6				29.7		27.5			
Approach LOS	A		A				C		C			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.1	48.2	13.6		56.4		13.6					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.5	2.5	3.9		2.5		7.9					
Green Ext Time (p_c), s	0.0	0.8	0.0		0.7		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.8
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	477	14	5	554	13	9	0	15	6	0	8
Future Volume (vph)	26	477	14	5	554	13	9	0	15	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1660	0	1744	1654	1445	0	1727	0	1719	1501	0
Flt Permitted	0.359			0.468				0.870				
Satd. Flow (perm)	633	1660	0	859	1654	1415	0	1530	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				126		139			377	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	528	0	5	596	14	0	26	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.35		0.01	0.43	0.01		0.09		0.03	0.02	
Control Delay	0.8	2.6		3.8	5.2	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.8	2.6		3.8	5.2	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.5			5.1			0.7			11.5	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	83		m1	173	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	645	1493		718	1383	1204		325		242	527	
Starvation Cap Reductn	0	0		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	0.04	0.35		0.01	0.43	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 3.9

Intersection LOS: A

Intersection Capacity Utilization 47.3%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø5 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2031 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	477	14	5	554	13	9	0	15	6	0	8
Future Volume (veh/h)	26	477	14	5	554	13	9	0	15	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	28	513	15	5	596	14	10	0	15	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	691	1288	38	762	1295	1123	88	0	24	161	70	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1572	46	912	1793	1554	418	0	626	1360	1837	0
Grp Volume(v), veh/h	28	0	528	5	596	14	25	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1618	912	1793	1554	1044	0	0	1360	1837	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.40		0.60	1.00		0.00
Lane Grp Cap(c), veh/h	691	0	1325	762	1295	1123	97	0	0	161	70	0
V/C Ratio(X)	0.04	0.00	0.40	0.01	0.46	0.01	0.26	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	790	0	1325	762	1295	1123	241	0	0	292	247	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	0.90	0.90	0.90	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	33.9	0.0	0.0	32.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.0	1.1	0.0	1.4	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.5	0.0	0.7	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.7	0.0	1.1	0.0	35.3	0.0	0.0	32.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	556			615			25			6		
Approach Delay, s/veh	0.7			1.0			35.3			32.6		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.8	56.0		7.3		62.7		7.3				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	38.6		8.4		49.6		8.4				
Max Q Clear Time (g_c+I1), s	2.8	2.5		2.7		2.5		3.7				
Green Ext Time (p_c), s	0.0	0.7		0.0		0.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				1.8								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	446	1	11	454	25	61	27	37	29	16	48
Future Volume (vph)	39	446	1	11	454	25	61	27	37	29	16	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1685	0	1246	1593	0	1248	1495	0	0	1794	0
Flt Permitted	0.444			0.465			0.756				0.870	
Satd. Flow (perm)	787	1685	0	610	1593	0	993	1495	0	0	1584	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7			40			52	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	481	0	12	515	0	66	69	0	0	100	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	52.2	52.2		52.2	52.2		11.2	11.2			11.2	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.16	0.16			0.16	
v/c Ratio	0.07	0.38		0.03	0.43		0.42	0.25			0.34	
Control Delay	1.0	1.5		4.6	6.5		33.3	15.1			16.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.0	1.5		4.6	6.5		33.3	15.1			16.6	
LOS	A	A		A	A		C	B			B	
Approach Delay		1.4			6.4			24.0			16.6	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	8		1	78		26	11			18	
Queue Length 95th (ft)	3	18		7	175		57	40			53	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	587	1256		455	1190		283	455			489	
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	0.07	0.38		0.03	0.43		0.23	0.15			0.20	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 7.0

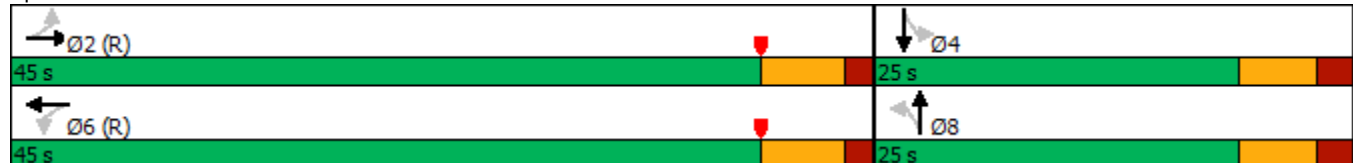
Intersection LOS: A

Intersection Capacity Utilization 54.8%

ICU Level of Service A

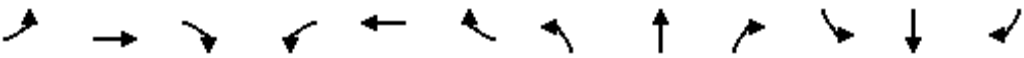
Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2031 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	446	1	11	454	25	61	27	37	29	16	48
Future Volume (veh/h)	39	446	1	11	454	25	61	27	37	29	16	48
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		0.99	1.00		0.99
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	42	480	0	12	488	26	66	29	18	31	17	34
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	653	1275	0	654	1304	69	218	97	60	113	45	62
Arrive On Green	1.00	1.00	0.00	0.76	0.76	0.74	0.10	0.10	0.09	0.09	0.10	0.09
Sat Flow, veh/h	829	1680	0	726	1718	92	999	975	605	423	452	620
Grp Volume(v), veh/h	42	480	0	12	0	514	66	0	47	82	0	0
Grp Sat Flow(s),veh/h/ln	829	1680	0	726	0	1810	999	0	1580	1494	0	0
Q Serve(g_s), s	0.5	0.0	0.0	0.3	0.0	6.7	0.0	0.0	1.9	2.0	0.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	0.0	0.3	0.0	6.7	3.4	0.0	1.9	3.9	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.05	1.00		0.38	0.38		0.41
Lane Grp Cap(c), veh/h	653	1275	0	654	0	1374	218	0	157	198	0	0
V/C Ratio(X)	0.06	0.38	0.00	0.02	0.00	0.37	0.30	0.00	0.30	0.41	0.00	0.00
Avail Cap(c_a), veh/h	653	1275	0	654	0	1374	404	0	452	507	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.5	0.0	0.0	2.1	0.0	2.8	29.9	0.0	29.4	30.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.8	0.0	0.1	0.0	0.8	0.8	0.0	1.1	1.4	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(95%),veh/ln	0.1	0.5	0.0	0.0	0.0	2.3	1.9	0.0	1.3	2.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.8	0.0	2.1	0.0	3.6	30.7	0.0	30.5	31.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	522			526			113			82		
Approach Delay, s/veh	0.8			3.6			30.6			31.9		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	58.0			12.0			58.0			12.0		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			5.9			8.7			5.4		
Green Ext Time (p_c), s	14.3			0.2			14.4			0.3		

Intersection Summary

HCM 6th Ctrl Delay 6.7
HCM 6th LOS A

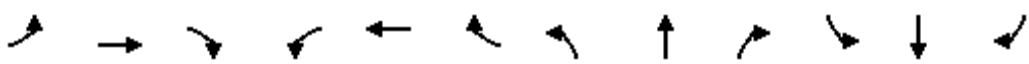
Notes

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

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	390	0	91	568	153	0	0	210	58
Future Volume (vph)	0	0	0	390	0	91	568	153	0	0	210	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.443					
Satd. Flow (perm)	0	0	0	0	1546	1145	720	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	406	95	592	159	0	0	219	60
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.5	16.5	32.8	32.8			15.8	15.8
Actuated g/C Ratio					0.28	0.28	0.56	0.56			0.27	0.27
v/c Ratio					0.94	0.22	1.04	0.20			0.54	0.12
Control Delay					54.9	2.1	64.2	7.2			23.9	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					54.9	2.1	64.2	7.2			23.9	0.4
LOS					D	A	E	A			C	A
Approach Delay					44.9			52.1			18.8	
Approach LOS					D			D			B	
Queue Length 50th (ft)					143	0	~144	25			66	0
Queue Length 95th (ft)					#299	9	#409	50			124	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					434	439	569	824			441	550
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	0.22	1.04	0.19			0.50	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.8

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 43.7

Intersection LOS: D

Intersection Capacity Utilization 93.8%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	390	0	91	568	153	0	0	210	58
Future Volume (veh/h)	0	0	0	390	0	91	568	153	0	0	210	58
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				406	0	0	592	159	0	0	219	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				493	0		616	815	0	0	396	
Arrive On Green				0.26	0.00	0.00	0.22	0.55	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				406	0	0	592	159	0	0	219	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				11.7	0.0	0.0	12.0	3.0	0.0	0.0	6.3	0.0
Cycle Q Clear(g_c), s				11.7	0.0	0.0	12.0	3.0	0.0	0.0	6.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				493	0		616	815	0	0	396	
V/C Ratio(X)				0.82	0.00		0.96	0.20	0.00	0.00	0.55	
Avail Cap(c_a), veh/h				540	0		616	924	0	0	518	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.0	0.0	0.0	14.0	6.2	0.0	0.0	18.2	0.0
Incr Delay (d2), s/veh				9.3	0.0	0.0	26.9	0.4	0.0	0.0	4.3	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
%ile BackOfQ(95%),veh/ln				9.7	0.0	0.0	13.4	1.3	0.0	0.0	4.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				28.3	0.0	0.0	40.9	6.6	0.0	0.0	22.6	0.0
LnGrp LOS				C	A		D	A	A	A	C	
Approach Vol, veh/h					406			751			219	
Approach Delay, s/veh					28.3			33.6			22.6	
Approach LOS					C			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		19.6				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		5.0			14.0	8.3		13.7				
Green Ext Time (p_c), s		3.5			0.0	2.1		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				30.3								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	2	285	0	0	0	0	688	624	111	482	0
Future Volume (vph)	33	2	285	0	0	0	0	688	624	111	482	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	37	303	0	0	0	0	1396	0	118	513	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	93.8%											
Analysis Period (min)	15											
	ICU Level of Service F											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2031 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	33	2	285	0	0	0	0	688	624	111	482	0
Future Vol, veh/h	33	2	285	0	0	0	0	688	624	111	482	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	35	2	303	0	0	0	0	732	664	118	513	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1481	1481	513	-	0	0	732	0	0
Stage 1	749	749	-	-	-	-	-	-	-
Stage 2	732	732	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	131	162	597	0	-	-	694	-	0
Stage 1	561	478	-	0	-	-	-	-	0
Stage 2	571	486	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	109	0	597	-	-	-	694	-	-
Mov Cap-2 Maneuver	109	0	-	-	-	-	-	-	-
Stage 1	561	0	-	-	-	-	-	-	-
Stage 2	474	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.2	0	2.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	109	597	694	-
HCM Lane V/C Ratio	-	-	0.342	0.508	0.17	-
HCM Control Delay (s)	-	-	54.3	17.1	11.2	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	1.4	2.9	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	25	0	1294	759	5
Future Volume (vph)	6	25	0	1294	759	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1622	0	0	1734	1652	0
Flt Permitted	0.990					
Satd. Flow (perm)	1622	0	0	1734	1652	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	1438	849	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	78.1%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	0	1294	759	5
Future Vol, veh/h	6	25	0	1294	759	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	28	0	1438	843	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2284	846	849	0	-	0
Stage 1	846	-	-	-	-	-
Stage 2	1438	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	46	381	667	-	-	-
Stage 1	470	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	46	381	667	-	-	-
Mov Cap-2 Maneuver	46	-	-	-	-	-
Stage 1	470	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	34	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	667	-	158	-	-	
HCM Lane V/C Ratio	-	-	0.218	-	-	
HCM Control Delay (s)	0	-	34	-	-	
HCM Lane LOS	A	-	D	-	-	
HCM 95th %tile Q(veh)	0	-	0.8	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	20	105	8	13	77	42	868	8	11	632	154
Future Volume (vph)	349	20	105	8	13	77	42	868	8	11	632	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1570	0	1391	1565	0	1500	1616	0	1628	1581	0
Flt Permitted	0.692			0.668			0.140			0.101		
Satd. Flow (perm)	1168	1570	0	977	1565	0	221	1616	0	173	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		117			86			1			29	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	388	139	0	9	100	0	47	973	0	12	873	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.17	0.26		0.03	0.20		0.38	1.07		0.12	0.97	
Control Delay	129.6	7.2		18.6	7.4		15.0	62.7		10.9	39.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	129.6	7.2		18.6	7.4		15.0	62.7		10.9	39.5	
LOS	F	A		B	A		B	E		B	D	
Approach Delay		97.3			8.3			60.5			39.1	
Approach LOS		F			A			E			D	
Queue Length 50th (ft)	~203	7		3	4		6	~478		2	319	
Queue Length 95th (ft)	#359	45		13	36		m12	#688		11	#593	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	333	532		279	508		124	912		97	904	
Starvation Cap Reductn	0	0		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	1.17	0.26		0.03	0.20		0.38	1.07		0.12	0.97	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.17

Intersection Signal Delay: 58.5

Intersection LOS: E

Intersection Capacity Utilization 84.6%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

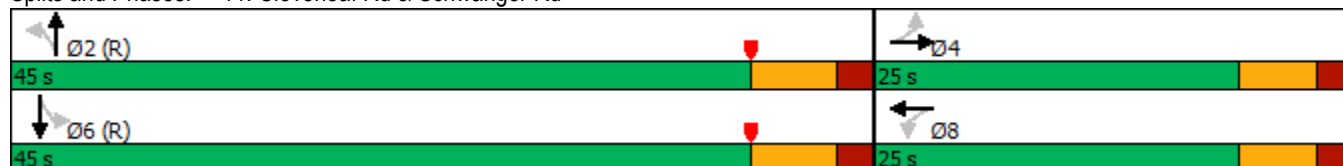
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2031 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	20	105	8	13	77	42	868	8	11	632	154
Future Volume (veh/h)	349	20	105	8	13	77	42	868	8	11	632	154
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	388	22	117	9	14	86	47	964	9	12	702	171
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	418	81	431	338	59	362	181	996	9	443	792	193
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1354	283	1508	1046	206	1266	610	1764	16	602	1403	342
Grp Volume(v), veh/h	388	0	139	9	0	100	47	0	973	12	0	873
Grp Sat Flow(s),veh/h/ln	1354	0	1791	1046	0	1472	610	0	1781	602	0	1745
Q Serve(g_s), s	16.3	0.0	4.3	0.5	0.0	3.7	4.8	0.0	0.0	0.6	0.0	30.6
Cycle Q Clear(g_c), s	20.0	0.0	4.3	4.7	0.0	3.7	35.4	0.0	0.0	0.6	0.0	30.6
Prop In Lane	1.00		0.84	1.00		0.86	1.00		0.01	1.00		0.20
Lane Grp Cap(c), veh/h	418	0	512	338	0	421	181	0	1005	443	0	985
V/C Ratio(X)	0.93	0.00	0.27	0.03	0.00	0.24	0.26	0.00	0.97	0.03	0.00	0.89
Avail Cap(c_a), veh/h	418	0	512	338	0	421	181	0	1005	443	0	985
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	19.7	21.2	0.0	19.5	13.7	0.0	0.0	6.8	0.0	13.4
Incr Delay (d2), s/veh	26.9	0.0	0.3	0.0	0.0	0.3	2.3	0.0	16.7	0.1	0.0	11.6
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(95%),veh/ln	14.5	0.0	3.0	0.2	0.0	2.2	1.1	0.0	7.5	0.1	0.0	17.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	0.0	20.0	21.2	0.0	19.8	16.0	0.0	16.7	6.9	0.0	25.0
LnGrp LOS	E	A	B	C	A	B	B	A	B	A	A	C
Approach Vol, veh/h	527		109				1020				885	
Approach Delay, s/veh	45.9		19.9				16.6				24.8	
Approach LOS	D		B				B				C	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	45.0		25.0		45.0		25.0					
Change Period (Y+Rc), s	6.5		6.0		6.5		6.0					
Max Green Setting (Gmax), s	38.5		19.0		38.5		19.0					
Max Q Clear Time (g_c+I1), s	2.0		22.0		32.6		6.7					
Green Ext Time (p_c), s	30.8		0.0		5.4		0.2					
Intersection Summary												
HCM 6th Ctrl Delay	25.7											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	35	2	856	7	63	659	7
Future Volume (vph)	36	0	17	17	1	35	2	856	7	63	659	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1631	0	0	1561	0	0	1618	1648
Flt Permitted		0.962			0.876			0.999			0.873	
Satd. Flow (perm)	0	1674	1581	0	1452	0	0	1560	0	0	1418	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		36			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	55	0	0	901	0	0	752	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.8	8.8		8.6			58.3			58.3	58.3
Actuated g/C Ratio		0.13	0.13		0.12			0.83			0.83	0.83
v/c Ratio		0.18	0.08		0.26			0.69			0.64	0.01
Control Delay		28.5	2.8		17.0			9.6			11.0	0.6
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		28.5	2.8		17.0			9.6			11.0	0.6
LOS		C	A		B			A			B	A
Approach Delay		20.2			17.0			9.6			10.9	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		15	0		7			180			248	0
Queue Length 95th (ft)		39	5		36			#538			m282	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		298	320		288			1299			1181	1379
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		0.13	0.06		0.19			0.69			0.64	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 10.7

Intersection LOS: B

Intersection Capacity Utilization 106.4%

ICU Level of Service G

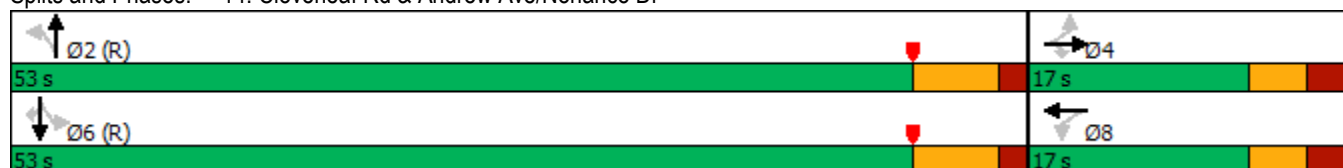
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	35	2	856	7	63	659	7
Future Volume (veh/h)	36	0	17	17	1	35	2	856	7	63	659	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	36	2	892	7	66	686	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	227	0	124	94	10	69	52	1274	10	127	1167	1299
Arrive On Green	0.06	0.00	0.08	0.06	0.08	0.06	0.77	0.79	0.77	1.00	1.00	1.00
Sat Flow, veh/h	1585	0	1586	333	131	879	1	1621	13	91	1484	1652
Grp Volume(v), veh/h	38	0	18	55	0	0	901	0	0	752	0	7
Grp Sat Flow(s),veh/h/ln	1585	0	1586	1344	0	0	1634	0	0	1575	0	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.7	3.0	0.0	0.0	18.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.33		0.65	0.00		0.01	0.09		1.00
Lane Grp Cap(c), veh/h	204	0	124	154	0	0	1313	0	0	1271	0	1299
V/C Ratio(X)	0.19	0.00	0.15	0.36	0.00	0.00	0.69	0.00	0.00	0.59	0.00	0.01
Avail Cap(c_a), veh/h	337	0	283	307	0	0	1313	0	0	1271	0	1299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.19	0.00	0.19
Uniform Delay (d), s/veh	30.9	0.0	30.1	31.6	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.4	0.0	0.0	2.9	0.0	0.0	0.4	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(95%),veh/ln	1.1	0.0	0.5	1.7	0.0	0.0	5.9	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	30.6	33.0	0.0	0.0	6.6	0.0	0.0	0.4	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56			55			901			759		
Approach Delay, s/veh	31.1			33.0			6.6			0.4		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	60.0			10.0			60.0			10.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	47.0			11.5			47.0			11.5		
Max Q Clear Time (g_c+I1), s	20.8			3.5			2.0			5.0		
Green Ext Time (p_c), s	21.4			0.1			28.3			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	5.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	242	39	48	239	207	75	382	47	111	219	193
Future Volume (vph)	285	242	39	48	239	207	75	382	47	111	219	193
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1688	0	1500	1509	1388
Flt Permitted	0.319			0.600			0.556			0.210		
Satd. Flow (perm)	499	1660	1088	753	1649	1561	958	1688	0	331	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		8				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	303	257	41	51	254	220	80	456	0	118	233	205
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	30.8	30.8	30.8	15.7	15.7	15.7	27.8	21.7		27.9	21.8	21.8
Actuated g/C Ratio	0.41	0.41	0.41	0.21	0.21	0.21	0.37	0.29		0.37	0.29	0.29
v/c Ratio	0.92	0.38	0.08	0.32	0.74	0.43	0.19	0.92		0.48	0.53	0.36
Control Delay	54.7	18.2	0.3	32.7	42.7	6.0	14.2	54.6		20.4	29.4	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	54.7	18.2	0.3	32.7	42.7	6.0	14.2	54.6		20.4	29.4	4.5
LOS	D	B	A	C	D	A	B	D		C	C	A
Approach Delay		35.4			26.3			48.6			18.3	
Approach LOS		D			C			D			B	
Queue Length 50th (ft)	109	87	0	21	117	0	21	216		33	97	0
Queue Length 95th (ft)	#267	146	0	54	#213	45	48	#417		67	173	37

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	331	739	567	183	400	560	429	495		249	438	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.92	0.35	0.07	0.28	0.64	0.39	0.19	0.92		0.47	0.53	0.36

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 74.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 32.1

Intersection LOS: C

Intersection Capacity Utilization 79.8%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	242	39	48	239	207	75	382	47	111	219	193
Future Volume (veh/h)	285	242	39	48	239	207	75	382	47	111	219	193
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	303	257	28	51	254	0	80	406	48	118	233	175
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	374	674	476	244	317		413	481	57	293	451	399
Arrive On Green	0.13	0.39	0.39	0.37	0.37	0.00	0.06	0.26	0.25	0.09	0.29	0.29
Sat Flow, veh/h	1641	1709	1206	777	1724	1532	1988	1814	214	1522	1528	1352
Grp Volume(v), veh/h	303	257	28	51	254	0	80	0	454	118	233	175
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	777	1724	1532	1988	0	2028	1522	1528	1352
Q Serve(g_s), s	9.5	7.6	1.0	3.4	9.4	0.0	2.0	0.0	15.1	3.8	9.0	7.5
Cycle Q Clear(g_c), s	9.5	7.6	1.0	3.4	9.4	0.0	2.0	0.0	15.1	3.8	9.0	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	374	674	476	244	317		413	0	537	293	451	399
V/C Ratio(X)	0.81	0.38	0.06	0.21	0.80		0.19	0.00	0.84	0.40	0.52	0.44
Avail Cap(c_a), veh/h	374	792	559	298	436		508	0	613	320	462	408
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	15.4	13.4	19.4	21.3	0.0	17.0	0.0	24.8	17.6	20.9	20.3
Incr Delay (d2), s/veh	12.6	0.1	0.0	0.2	5.0	0.0	0.2	0.0	9.5	0.9	1.0	0.8
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(95%),veh/ln	8.3	4.6	0.4	1.0	5.8	0.0	1.6	0.0	13.1	2.3	5.5	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.2	15.5	13.4	19.6	26.4	0.0	17.2	0.0	34.4	18.5	21.8	21.1
LnGrp LOS	C	B	B	B	C		B	A	C	B	C	C
Approach Vol, veh/h	588			305			534			526		
Approach Delay, s/veh	24.5			25.3			31.8			20.8		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	12.7	24.9		33.6	10.6	27.0				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	11.9	6.3	17.1		10.1	4.5	11.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8		0.1	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay	25.6											
HCM 6th LOS	C											

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	118	0	797	13	126	523	0
Future Volume (vph)	0	0	0	0	0	118	0	797	13	126	523	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Satd. Flow (prot)	0	1863	0	0	1611	0	0	1724	0	0	1752	0
Flt Permitted											0.990	
Satd. Flow (perm)	0	1863	0	0	1611	0	0	1724	0	0	1752	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	131	0	0	900	0	0	721	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 94.5% ICU Level of Service F

Analysis Period (min) 15

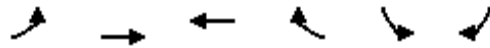
HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2031 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	118	0	797	13	126	523	0
Future Vol, veh/h	0	0	0	0	0	118	0	797	13	126	523	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	9	2	2	10	2
Mvmt Flow	0	0	0	0	0	131	0	886	14	140	581	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1820	1761	581	1754	1754	893	581	0	0	900	0	0
Stage 1	861	861	-	893	893	-	-	-	-	-	-	-
Stage 2	959	900	-	861	861	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	60	84	514	67	85	356	993	-	-	643	-	-
Stage 1	350	372	-	336	360	-	-	-	-	-	-	-
Stage 2	309	357	-	350	372	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	28	57	514	50	58	356	993	-	-	643	-	-
Mov Cap-2 Maneuver	28	57	-	50	58	-	-	-	-	-	-	-
Stage 1	350	252	-	336	360	-	-	-	-	-	-	-
Stage 2	195	357	-	237	252	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		20.9		0		2.4					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	993	-	-	-	356	643	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.368	0.218	-	-				
HCM Control Delay (s)	0	-	-	0	20.9	12.2	0	-				
HCM Lane LOS	A	-	-	A	C	B	A	-				
HCM 95th %tile Q(veh)	0	-	-	-	1.7	0.8	-	-				

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

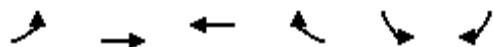
2031 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	298	400	32	50	131
Future Volume (vph)	101	298	400	32	50	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1710	1651	1714	1500	1676	1500
Flt Permitted	0.416				0.950	
Satd. Flow (perm)	749	1651	1714	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				36		146
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2697		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	9%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	331	444	36	56	146
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	22.0	22.0	22.0	22.0	13.0
Total Split (s)	13.0	58.0	45.0	45.0	22.0	13.0
Total Split (%)	16.3%	72.5%	56.3%	56.3%	27.5%	16.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	65.6	67.6	52.7	52.7	9.3	17.3
Actuated g/C Ratio	0.82	0.84	0.66	0.66	0.12	0.22
v/c Ratio	0.16	0.24	0.39	0.04	0.29	0.33
Control Delay	3.0	3.1	9.6	3.2	35.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	3.1	9.6	3.2	35.4	6.0
LOS	A	A	A	A	D	A
Approach Delay		3.1	9.1		14.1	
Approach LOS		A	A		B	
Queue Length 50th (ft)	11	38	109	0	26	0
Queue Length 95th (ft)	26	76	202	12	58	37
Internal Link Dist (ft)		730	2617		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	716	1395	1128	999	356	447

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2031 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.16	0.24	0.39	0.04	0.16	0.33

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 7.6

Intersection LOS: A

Intersection Capacity Utilization 44.0%

ICU Level of Service A

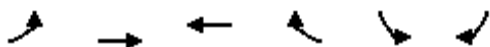
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2031 Build
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	298	400	32	50	131
Future Volume (veh/h)	101	298	400	32	50	131
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	1800	1674	1730	1772	1772	1772
Adj Flow Rate, veh/h	112	331	444	36	56	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	9	5	2	2	2
Cap, veh/h	626	1249	1081	939	218	281
Arrive On Green	0.06	0.75	0.63	0.63	0.13	0.13
Sat Flow, veh/h	1714	1674	1730	1502	1688	1502
Grp Volume(v), veh/h	112	331	444	36	56	146
Grp Sat Flow(s),veh/h/ln	1714	1674	1730	1502	1688	1502
Q Serve(g_s), s	1.6	5.0	10.4	0.7	2.4	7.0
Cycle Q Clear(g_c), s	1.6	5.0	10.4	0.7	2.4	7.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	626	1249	1081	939	218	281
V/C Ratio(X)	0.18	0.27	0.41	0.04	0.26	0.52
Avail Cap(c_a), veh/h	698	1249	1081	939	359	407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.7	3.2	7.6	5.8	31.4	29.3
Incr Delay (d2), s/veh	0.1	0.5	1.2	0.1	0.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	1.9	5.7	0.4	1.8	4.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.9	3.7	8.7	5.8	32.0	30.7
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		443	480		202	
Approach Delay, s/veh		4.0	8.5		31.1	
Approach LOS		A	A		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.7	55.0			64.7	15.3
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	39.0			52.0	16.0
Max Q Clear Time (g_c+I1), s	3.6	12.4			7.0	9.0
Green Ext Time (p_c), s	0.1	1.8			1.2	0.4

Intersection Summary

HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2031 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	319	433	38	36	3
Future Volume (vph)	3	319	433	38	36	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1716	0	1569	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1318	1693	1716	0	1569	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	351	518	0	43	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.1% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	319	433	38	36	3
Future Vol, veh/h	3	319	433	38	36	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	351	476	42	40	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	518	0	-	0	854	497
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	357	-
Critical Hdwy	4.4	-	-	-	6.84	6.7
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	3.3	-	-	-	3	3.4
Pot Cap-1 Maneuver	728	-	-	-	331	526
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	777	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	728	-	-	-	330	526
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	651	-
Stage 2	-	-	-	-	777	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.3		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	728	-	-	-	476	
HCM Lane V/C Ratio	0.005	-	-	-	0.09	
HCM Control Delay (s)	10	-	-	-	13.3	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Lanes, Volumes, Timings
31: Ridge Run Rd & Site Driveway

2031 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	10	14	27	30	0
Future Volume (vph)	0	10	14	27	30	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1630	1632	0
Flt Permitted				0.983		
Satd. Flow (perm)	1611	0	0	1630	1632	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	435			1286	904	
Travel Time (s)	11.9			25.1	17.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	12%	7%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	46	33	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
31: Ridge Run Rd & Site Driveway

2031 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	14	27	30	0
Future Vol, veh/h	0	10	14	27	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	12	7	2
Mvmt Flow	0	11	16	30	33	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	95	33	33	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	62	-	-	-	-	-
Critical Hdwy	6.42	6.22	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	1054	1113	1176	-	-	-
Stage 1	1158	-	-	-	-	-
Stage 2	1122	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1039	1113	1176	-	-	-
Mov Cap-2 Maneuver	1039	-	-	-	-	-
Stage 1	1142	-	-	-	-	-
Stage 2	1122	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.3	2.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1176	-	1113	-	-	
HCM Lane V/C Ratio	0.013	-	0.01	-	-	
HCM Control Delay (s)	8.1	0	8.3	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2031 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	23	35	6	44	123	47	343	9	32	192	79
Future Volume (vph)	70	23	35	6	44	123	47	343	9	32	192	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1301	0	0	1537	0	0	1665	0	0	1514	0
Flt Permitted		0.973			0.998			0.994			0.995	
Satd. Flow (perm)	0	1301	0	0	1537	0	0	1665	0	0	1514	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	180	0	0	415	0	0	315	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 56.4%

ICU Level of Service B

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	16.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	70	23	35	6	44	123	47	343	9	32	192	79
Future Vol, veh/h	70	23	35	6	44	123	47	343	9	32	192	79
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	73	24	36	6	46	128	49	357	9	33	200	82
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13	11.6	19.8	15.9
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	55%	3%	11%
Vol Thru, %	86%	18%	25%	63%
Vol Right, %	2%	27%	71%	26%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	399	128	173	303
LT Vol	47	70	6	32
Through Vol	343	23	44	192
RT Vol	9	35	123	79
Lane Flow Rate	416	133	180	316
Geometry Grp	1	1	1	1
Degree of Util (X)	0.666	0.27	0.302	0.53
Departure Headway (Hd)	5.771	7.281	6.028	6.154
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	619	496	600	590
Service Time	3.866	5.292	4.028	4.154
HCM Lane V/C Ratio	0.672	0.268	0.3	0.536
HCM Control Delay	19.8	13	11.6	15.9
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	5	1.1	1.3	3.1

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	770	89	227	608	128	156
Future Volume (vph)	770	89	227	608	128	156
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1803	0	1744	1958	1576	0
Flt Permitted			0.089		0.978	
Satd. Flow (perm)	1803	0	163	1958	1576	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	11					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	944	0	249	668	312	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	1.02		0.93	0.52	0.95	
Control Delay	56.9		47.0	7.3	71.5	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	56.9		47.0	7.3	71.5	
LOS	E		D	A	E	
Approach Delay	56.9			18.1	71.5	
Approach LOS	E			B	E	
Queue Length 50th (ft)	~473		67	141	154	
Queue Length 95th (ft)	#735		m#105	m160	#307	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	924		268	1292	330	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	1.02		0.93	0.52	0.95	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 42.6

Intersection LOS: D

Intersection Capacity Utilization 91.4%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2031 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	770	89	227	608	128	156
Future Volume (veh/h)	770	89	227	608	128	156
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	846	89	249	668	141	171
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	787	83	281	1379	157	190
Arrive On Green	0.51	0.50	0.20	1.00	0.21	0.20
Sat Flow, veh/h	1544	162	1914	2090	748	907
Grp Volume(v), veh/h	0	935	249	668	313	0
Grp Sat Flow(s),veh/h/ln	0	1706	1914	2090	1660	0
Q Serve(g_s), s	0.0	40.8	6.2	0.0	14.7	0.0
Cycle Q Clear(g_c), s	0.0	40.8	6.2	0.0	14.7	0.0
Prop In Lane		0.10	1.00		0.45	0.55
Lane Grp Cap(c), veh/h	0	870	281	1379	349	0
V/C Ratio(X)	0.00	1.07	0.88	0.48	0.90	0.00
Avail Cap(c_a), veh/h	0	870	281	1379	349	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	19.6	19.6	0.0	31.0	0.0
Incr Delay (d2), s/veh	0.0	52.6	26.6	1.2	27.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	37.0	7.3	0.8	13.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	72.3	46.2	1.2	58.3	0.0
LnGrp LOS	A	F	D	A	E	A
Approach Vol, veh/h	935			917	313	
Approach Delay, s/veh	72.3			13.4	58.3	
Approach LOS	E			B	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.0	46.0		22.0		58.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	8.2	42.8		16.7		2.0
Green Ext Time (p_c), s	0.0	0.0		0.0		22.4
Intersection Summary						
HCM 6th Ctrl Delay			45.3			
HCM 6th LOS			D			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	961	0	0	1119	102	1	0	2	44	0	50
Future Volume (vph)	28	961	0	0	1119	102	1	0	2	44	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1742	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1742	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	1033	0	0	1313	0	0	3	0	47	54	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 78.1%

ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	8.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	961	0	0	1119	102	1	0	2	44	0	50
Future Vol, veh/h	28	961	0	0	1119	102	1	0	2	44	0	50
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	30	1033	0	0	1203	110	1	0	2	47	0	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1313	0	0	1033	0	0	2379	2406	1033	2352	2351	1259
Stage 1	-	-	-	-	-	-	1093	1093	-	1258	1258	-
Stage 2	-	-	-	-	-	-	1286	1313	-	1094	1093	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	512	-	-	369	-	-	33	44	313	~ 39	54	242
Stage 1	-	-	-	-	-	-	324	330	-	283	302	-
Stage 2	-	-	-	-	-	-	255	266	-	344	351	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	512	-	-	369	-	-	24	41	313	~ 37	51	242
Mov Cap-2 Maneuver	-	-	-	-	-	-	24	41	-	~ 37	51	-
Stage 1	-	-	-	-	-	-	305	311	-	266	302	-
Stage 2	-	-	-	-	-	-	198	266	-	322	330	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	66.2	204.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	62	512	-	-	369	-	-	37	242
HCM Lane V/C Ratio	0.052	0.059	-	-	-	-	-	1.279	0.222
HCM Control Delay (s)	66.2	12.5	-	-	0	-	-	409.8	24.1
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	4.9	0.8

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	769	38	157	923	18	279	3	120	24	8	17
Future Volume (vph)	15	769	38	157	923	18	279	3	120	24	8	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1742	0
Flt Permitted	0.183			0.096			0.740			0.675		
Satd. Flow (perm)	318	1766	1550	159	1697	1608	1314	1576	0	1251	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40			125			18
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	801	40	164	961	19	291	128	0	25	26	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.3	37.3	37.3	51.5	50.2	50.2	19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.64	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.11	0.97	0.05	0.66	0.90	0.02	0.93	0.27		0.08	0.06	
Control Delay	12.8	31.9	0.2	29.8	14.6	0.1	68.5	7.0		24.7	14.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	12.8	31.9	0.2	29.8	14.6	0.1	68.5	7.0		24.7	14.0	
LOS	B	C	A	C	B	A	E	A		C	B	
Approach Delay		30.1			16.5			49.7			19.3	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	3	238	0	28	27	0	143	1		10	3	
Queue Length 95th (ft)	m4	m252	m0	m65	#662	m0	#290	42		29	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	148	824	784	252	1064	1023	313	471		298	429	
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	0.11	0.97	0.05	0.65	0.90	0.02	0.93	0.27		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 26.9

Intersection LOS: C

Intersection Capacity Utilization 100.5%

ICU Level of Service G

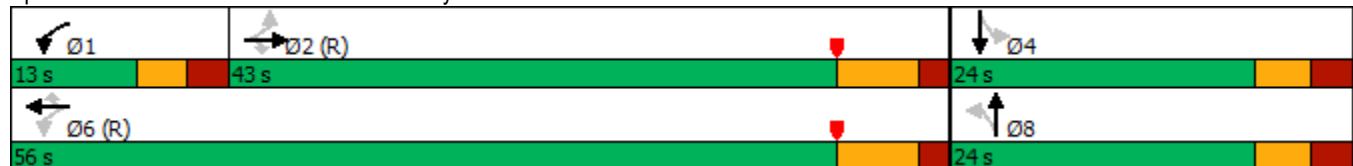
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	769	38	157	923	18	279	3	120	24	8	17
Future Volume (veh/h)	15	769	38	157	923	18	279	3	120	24	8	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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	16	801	25	164	961	16	291	3	85	25	8	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	399	989	849	505	1092	971	433	14	385	373	155	290
Arrive On Green	0.97	0.97	0.97	0.17	1.00	1.00	0.24	0.24	0.22	0.24	0.24	0.22
Sat Flow, veh/h	634	2032	1745	1666	1736	1542	1468	57	1627	1411	653	1225
Grp Volume(v), veh/h	16	801	25	164	961	16	291	0	88	25	0	23
Grp Sat Flow(s),veh/h/ln	634	2032	1745	1666	1736	1542	1468	0	1685	1411	0	1878
Q Serve(g_s), s	0.1	4.0	0.0	3.5	0.0	0.0	15.2	0.0	3.4	1.2	0.0	0.8
Cycle Q Clear(g_c), s	0.1	4.0	0.0	3.5	0.0	0.0	15.4	0.0	3.4	4.1	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.65
Lane Grp Cap(c), veh/h	399	989	849	505	1092	971	433	0	399	373	0	445
V/C Ratio(X)	0.04	0.81	0.03	0.32	0.88	0.02	0.67	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	399	989	849	538	1092	971	436	0	402	376	0	448
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)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.5	0.6	0.5	6.6	0.0	0.0	29.3	0.0	25.0	26.0	0.0	23.8
Incr Delay (d2), s/veh	0.2	7.2	0.1	0.2	5.8	0.0	4.0	0.0	0.3	0.1	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(95%),veh/ln	0.0	4.2	0.0	1.6	3.2	0.0	9.6	0.0	2.5	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.7	7.8	0.6	6.8	5.8	0.0	33.3	0.0	25.3	26.1	0.0	23.9
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	842			1141			379			48		
Approach Delay, s/veh	7.4			5.8			31.4			25.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	11.4	44.7	23.8			56.2	23.8					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2	* 18					
Max Q Clear Time (g_c+I1), s	6.0	6.5	6.6			2.5	17.9					
Green Ext Time (p_c), s	0.1	1.0	0.1			1.3	0.0					

Intersection Summary

HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	591	1	11	928	76	9	2	1	43	3	116
Future Volume (vph)	88	591	1	11	928	76	9	2	1	43	3	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%				-1%
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.132			0.429				0.707		0.750		
Satd. Flow (perm)	233	1729	0	716	1818	1561	0	1338	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			122	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	93	623	0	12	977	80	0	12	0	45	125	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.9	64.1		55.3	55.3	55.3		9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.31	0.45		0.02	0.78	0.07		0.08		0.29	0.44	
Control Delay	4.4	7.8		4.1	14.5	0.3		29.9		36.2	12.1	
Queue Delay	0.0	0.0		0.0	0.3	0.0		0.0		0.0	0.0	
Total Delay	4.4	7.8		4.1	14.8	0.3		29.9		36.2	12.1	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		7.4			13.6			29.9			18.5	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	9	184		1	411	1		5		21	1	
Queue Length 95th (ft)	m15	m294		m2	#698	m0		19		50	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	303	1384		494	1255	1112		224		227	353	
Starvation Cap Reductn	0	0		0	37	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	0.31	0.45		0.02	0.80	0.07		0.05		0.20	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 11.8

Intersection LOS: B

Intersection Capacity Utilization 76.7%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

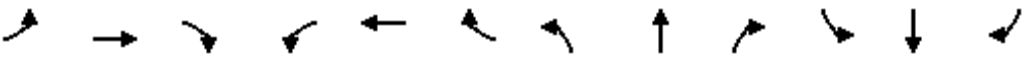
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary 10: Driveway/Market Sq Dr & SR 0230

2031 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	591	1	11	928	76	9	2	1	43	3	116
Future Volume (veh/h)	88	591	1	11	928	76	9	2	1	43	3	116
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	93	622	1	12	977	71	9	2	0	45	3	66
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	514	1338	2	623	1331	1136	113	19	0	212	5	116
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.07	0.08	0.00	0.08	0.08	0.07
Sat Flow, veh/h	1629	1679	3	774	1935	1652	393	243	0	1376	67	1477
Grp Volume(v), veh/h	93	0	623	12	977	71	11	0	0	45	0	69
Grp Sat Flow(s),veh/h/ln	1629	0	1682	774	1935	1652	636	0	0	1376	0	1545
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	2.0	0.0	3.5
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.96
Lane Grp Cap(c), veh/h	514	0	1340	623	1331	1136	124	0	0	212	0	121
V/C Ratio(X)	0.18	0.00	0.47	0.02	0.73	0.06	0.09	0.00	0.00	0.21	0.00	0.57
Avail Cap(c_a), veh/h	561	0	1340	623	1331	1136	248	0	0	334	0	259
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(l)	0.22	0.00	0.22	0.58	0.58	0.58	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.6	0.0	0.0	34.9	0.0	36.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.0	2.1	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.2	0.0	1.4	0.0	0.4	0.0	0.0	1.5	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.0	0.3	0.0	2.1	0.1	34.9	0.0	0.0	35.4	0.0	40.2
LnGrp LOS	A	A	A	A	A	A	C	A	A	D	A	D
Approach Vol, veh/h	716			1060			11			114		
Approach Delay, s/veh	0.5			2.0			34.9			38.3		
Approach LOS	A			A			C			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.7	60.4		10.9		69.1		10.9				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.6	2.5		5.5		2.5		5.5				
Green Ext Time (p_c), s	0.0	1.5		0.2		0.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				3.8								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	538	22	42	813	33	95	37	31	34	45	97
Future Volume (vph)	64	538	22	42	813	33	95	37	31	34	45	97
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1712	0	1573	1679	0	1572	1603	0	0	1801	0
Flt Permitted	0.222			0.388			0.513				0.921	
Satd. Flow (perm)	386	1712	0	642	1679	0	848	1603	0	0	1675	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			4			33			83	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	589	0	44	891	0	100	72	0	0	185	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	55.9	55.9		55.9	55.9		14.2	14.2			14.2	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.18	0.18			0.18	
v/c Ratio	0.25	0.49		0.10	0.76		0.67	0.23			0.51	
Control Delay	3.1	2.2		5.9	15.1		50.5	17.7			20.3	
Queue Delay	0.0	0.0		0.0	0.6		0.0	0.0			0.0	
Total Delay	3.1	2.2		5.9	15.7		50.5	17.7			20.3	
LOS	A	A		A	B		D	B			C	
Approach Delay		2.3			15.2			36.8			20.3	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	1	9		6	238		47	17			45	
Queue Length 95th (ft)	5	25		22	#615		90	46			94	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	269	1197		448	1173		286	562			620	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	70		0	0			3	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.25	0.49		0.10	0.81		0.35	0.13			0.30	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 13.3

Intersection LOS: B

Intersection Capacity Utilization 84.9%

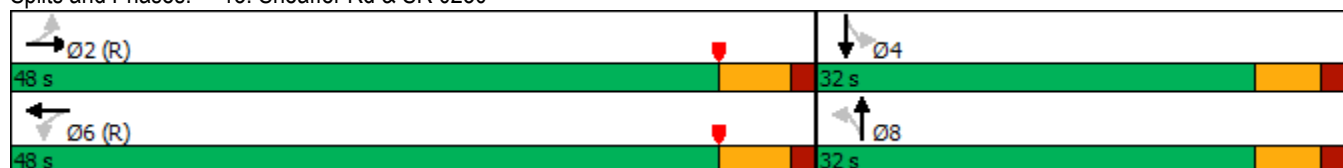
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2031 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	538	22	42	813	33	95	37	31	34	45	97
Future Volume (veh/h)	64	538	22	42	813	33	95	37	31	34	45	97
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	67	566	22	44	856	33	100	39	15	36	47	81
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	379	1203	47	699	1337	52	236	164	63	92	85	119
Arrive On Green	1.00	1.00	1.00	0.74	0.74	0.72	0.14	0.14	0.13	0.13	0.14	0.13
Sat Flow, veh/h	576	1633	63	827	1815	70	1179	1173	451	269	608	857
Grp Volume(v), veh/h	67	0	588	44	0	889	100	0	54	164	0	0
Grp Sat Flow(s),veh/h/ln	576	0	1696	827	0	1885	1179	0	1624	1734	0	0
Q Serve(g_s), s	3.5	0.0	0.0	1.2	0.0	18.8	0.5	0.0	2.4	4.4	0.0	0.0
Cycle Q Clear(g_c), s	22.4	0.0	0.0	1.2	0.0	18.8	7.7	0.0	2.4	7.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.04	1.00		0.28	0.22		0.49
Lane Grp Cap(c), veh/h	379	0	1250	699	0	1389	236	0	227	275	0	0
V/C Ratio(X)	0.18	0.00	0.47	0.06	0.00	0.64	0.42	0.00	0.24	0.60	0.00	0.00
Avail Cap(c_a), veh/h	379	0	1250	699	0	1389	470	0	548	611	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(l)	0.90	0.00	0.90	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.6	0.0	0.0	2.9	0.0	5.3	33.0	0.0	30.8	33.0	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	1.1	0.2	0.0	2.3	1.2	0.0	0.5	2.1	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(95%),veh/ln	0.5	0.0	0.7	0.3	0.0	8.8	3.4	0.0	1.7	5.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.5	0.0	1.1	3.1	0.0	7.5	34.2	0.0	31.3	35.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	D	A	A
Approach Vol, veh/h	655				933				154			
Approach Delay, s/veh	1.5				7.3				33.2			
Approach LOS	A				A				C			
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	63.8			16.2			63.8			16.2		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			9.2			20.8			9.7		
Green Ext Time (p_c), s	18.9			0.5			18.0			0.4		

Intersection Summary

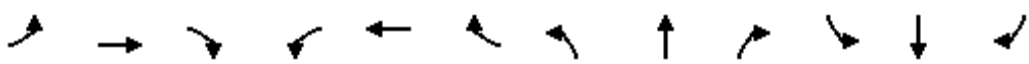
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	718	0	127	383	190	0	0	273	49
Future Volume (vph)	0	0	0	718	0	127	383	190	0	0	273	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.334					
Satd. Flow (perm)	0	0	0	0	1653	1414	559	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	756	134	403	200	0	0	287	52
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.5	25.5	29.4	29.4			16.4	16.4
Actuated g/C Ratio					0.40	0.40	0.46	0.46			0.25	0.25
v/c Ratio					1.15	0.21	1.05	0.29			0.68	0.10
Control Delay					109.1	3.0	80.8	12.4			31.3	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					109.1	3.0	80.8	12.4			31.3	0.4
LOS					F	A	F	B			C	A
Approach Delay					93.1			58.1			26.6	
Approach LOS					F			E			C	
Queue Length 50th (ft)					~366	0	~118	46			101	0
Queue Length 95th (ft)					#559	24	#332	87			#184	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2031 Build

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					655	651	382	704			438	537
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					1.15	0.21	1.05	0.28			0.66	0.10

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 64.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 69.3

Intersection LOS: E

Intersection Capacity Utilization 157.8%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	718	0	127	383	190	0	0	273	49
Future Volume (veh/h)	0	0	0	718	0	127	383	190	0	0	273	49
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				756	0	0	403	200	0	0	287	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				734	0		409	689	0	0	404	
Arrive On Green				0.40	0.00	0.00	0.13	0.44	0.00	0.00	0.23	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				756	0	0	403	200	0	0	287	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				25.5	0.0	0.0	8.0	5.1	0.0	0.0	9.2	0.0
Cycle Q Clear(g_c), s				25.5	0.0	0.0	8.0	5.1	0.0	0.0	9.2	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				734	0		409	689	0	0	404	
V/C Ratio(X)				1.03	0.00		0.99	0.29	0.00	0.00	0.71	
Avail Cap(c_a), veh/h				734	0		409	765	0	0	490	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.8	0.0	0.0	19.9	11.3	0.0	0.0	22.1	0.0
Incr Delay (d2), s/veh				41.1	0.0	0.0	40.8	0.8	0.0	0.0	8.4	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
%ile BackOfQ(95%),veh/ln				25.4	0.0	0.0	10.8	2.9	0.0	0.0	7.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				59.9	0.0	0.0	60.8	12.1	0.0	0.0	30.5	0.0
LnGrp LOS				F	A		E	B	A	A	C	
Approach Vol, veh/h					756			603			287	
Approach Delay, s/veh					59.9			44.6			30.5	
Approach LOS					E			D			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	32.0			13.0			19.0			30.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			5.5		
Max Green Setting (Gmax), s	29.0			7.0			16.0			24.5		
Max Q Clear Time (g_c+I1), s	7.1			10.0			11.2			27.5		
Green Ext Time (p_c), s	3.9			0.0			1.8			0.0		
Intersection Summary												
HCM 6th Ctrl Delay				49.2								
HCM 6th LOS				D								
Notes												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	3	605	0	0	0	0	533	592	101	897	0
Future Volume (vph)	44	3	605	0	0	0	0	533	592	101	897	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1563	1569	0	0	0	0	1666	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1563	1569	0	0	0	0	1666	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	624	0	0	0	0	1159	0	104	925	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 157.8%												
ICU Level of Service H												
Analysis Period (min) 15												

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2031 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	77.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	44	3	605	0	0	0	0	533	592	101	897	0
Future Vol, veh/h	44	3	605	0	0	0	0	533	592	101	897	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	45	3	624	0	0	0	0	549	610	104	925	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1682	1682	925	-	0	0	549	0	0
Stage 1	1133	1133	-	-	-	-	-	-	-
Stage 2	549	549	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	95	126	~ 369	0	-	-	792	-	0
Stage 1	371	338	-	0	-	-	-	-	0
Stage 2	664	569	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	83	0	~ 369	-	-	-	792	-	-
Mov Cap-2 Maneuver	83	0	-	-	-	-	-	-	-
Stage 1	371	0	-	-	-	-	-	-	-
Stage 2	577	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	329.6	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	83	369	792	-
HCM Lane V/C Ratio	-	-	0.584	1.69	0.131	-
HCM Control Delay (s)	-	-	96.7	347.7	10.2	-
HCM Lane LOS	-	-	F	F	B	-
HCM 95th %tile Q(veh)	-	-	2.6	38	0.5	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	1109	1475	11
Future Volume (vph)	3	9	8	1109	1475	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1801	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	1151	1532	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	88.3%			ICU Level of Service E		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	1109	1475	11
Future Vol, veh/h	3	9	8	1109	1475	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	1143	1521	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2686	1527	1532	0	-	0
Stage 1	1527	-	-	-	-	-
Stage 2	1159	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	25	150	404	-	-	-
Stage 1	215	-	-	-	-	-
Stage 2	329	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	24	150	404	-	-	-
Mov Cap-2 Maneuver	24	-	-	-	-	-
Stage 1	203	-	-	-	-	-
Stage 2	329	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	73	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	404	-	65	-	-
HCM Lane V/C Ratio	0.02	-	0.19	-	-
HCM Control Delay (s)	14.1	0	73	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	35	113	9	42	37	96	861	14	51	1107	331
Future Volume (vph)	226	35	113	9	42	37	96	861	14	51	1107	331
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1664	0	1416	1704	0	1620	1696	0	1628	1683	0
Flt Permitted	0.703			0.658			0.107			0.168		
Satd. Flow (perm)	1199	1664	0	981	1704	0	182	1696	0	288	1683	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92			39			3			48	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	238	156	0	9	83	0	101	921	0	54	1513	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	1.00	0.38		0.05	0.22		0.89	0.87		0.30	1.42	
Control Delay	87.1	13.0		20.2	14.3		28.8	13.8		10.6	210.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	87.1	13.0		20.2	14.3		28.8	13.8		10.6	210.3	
LOS	F	B		C	B		C	B		B	F	
Approach Delay		57.8			14.8			15.3			203.4	
Approach LOS		E			B			B			F	
Queue Length 50th (ft)	87	19		3	13		39	351		8	~766	
Queue Length 95th (ft)	#212	63		13	45		m37	m229		28	#1004	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	239	406		196	372		113	1061		180	1069	
Starvation Cap Reductn	0	0		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	1.00	0.38		0.05	0.22		0.89	0.87		0.30	1.42	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.42

Intersection Signal Delay: 116.6

Intersection LOS: F

Intersection Capacity Utilization 112.8%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2031 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	35	113	9	42	37	96	861	14	51	1107	331
Future Volume (veh/h)	226	35	113	9	42	37	96	861	14	51	1107	331
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	238	37	95	9	44	25	101	906	14	54	1165	337
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	353	103	263	267	218	124	120	1139	18	217	895	259
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1404	513	1316	1073	1089	619	357	1822	28	633	1432	414
Grp Volume(v), veh/h	238	0	132	9	0	69	101	0	920	54	0	1502
Grp Sat Flow(s),veh/h/ln	1404	0	1829	1073	0	1708	357	0	1850	633	0	1846
Q Serve(g_s), s	10.0	0.0	3.8	0.4	0.0	2.0	0.0	0.0	28.3	4.7	0.0	37.5
Cycle Q Clear(g_c), s	12.0	0.0	3.8	4.2	0.0	2.0	37.5	0.0	28.3	33.1	0.0	37.5
Prop In Lane	1.00		0.72	1.00		0.36	1.00		0.02	1.00		0.22
Lane Grp Cap(c), veh/h	353	0	366	267	0	342	120	0	1156	217	0	1154
V/C Ratio(X)	0.67	0.00	0.36	0.03	0.00	0.20	0.84	0.00	0.80	0.25	0.00	1.30
Avail Cap(c_a), veh/h	353	0	366	267	0	342	120	0	1156	217	0	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.00	0.09	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.1	0.0	21.0	22.5	0.0	20.2	42.6	0.0	20.2	23.5	0.0	11.4
Incr Delay (d2), s/veh	5.0	0.0	0.6	0.1	0.0	0.3	6.6	0.0	0.5	2.7	0.0	142.2
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(95%),veh/ln	6.4	0.0	2.8	0.2	0.0	1.4	2.4	0.0	15.3	1.4	0.0	81.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.1	0.0	21.6	22.6	0.0	20.5	49.1	0.0	20.7	26.3	0.0	153.6
LnGrp LOS	C	A	C	C	A	C	D	A	C	C	A	F
Approach Vol, veh/h	370			78			1021			1556		
Approach Delay, s/veh	27.1			20.7			23.5			149.2		
Approach LOS	C			C			C			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	30.3			14.0			39.5			6.2		
Green Ext Time (p_c), s	5.7			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	88.5											
HCM 6th LOS	F											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	63	0	155	17	802	5	130	1064	35
Future Volume (vph)	15	0	18	63	0	155	17	802	5	130	1064	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1620	0	0	1639	0	0	1718	1648
Flt Permitted		0.460			0.897			0.636			0.829	
Satd. Flow (perm)	0	800	1581	0	1474	0	0	1044	0	0	1431	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		163			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	229	0	0	867	0	0	1257	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.7			41.8			41.8	41.8
Actuated g/C Ratio		0.14	0.14		0.14			0.70			0.70	0.70
v/c Ratio		0.14	0.07		0.65			1.19			1.26	0.03
Control Delay		24.1	1.7		17.4			116.3			131.9	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		24.1	1.7		17.4			116.3			131.9	0.1
LOS		C	A		B			F			F	A
Approach Delay		11.9			17.4			116.3			128.1	
Approach LOS		B			B			F			F	
Queue Length 50th (ft)		5	0		21			~803			~636	0
Queue Length 95th (ft)		20	4		79			m#978			m34	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		140	322		392			727			996	1160
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		0.11	0.06		0.58			1.19			1.26	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.26

Intersection Signal Delay: 111.8

Intersection LOS: F

Intersection Capacity Utilization 145.1%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

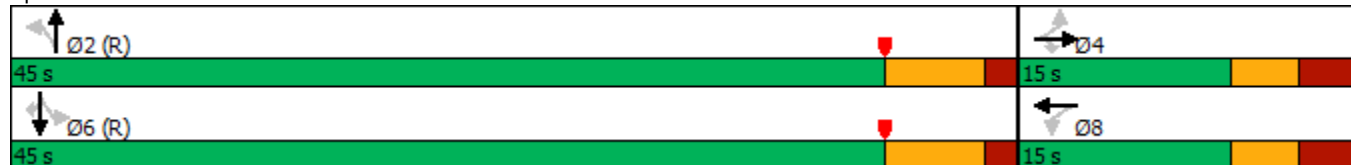
Queue shown is maximum after two cycles.

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	63	0	155	17	802	5	130	1064	35
Future Volume (veh/h)	15	0	18	63	0	155	17	802	5	130	1064	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	66	0	148	18	844	5	137	1120	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	299	0	278	145	17	188	61	697	4	129	700	1101
Arrive On Green	0.16	0.00	0.17	0.16	0.00	0.16	0.86	0.89	0.86	1.00	1.00	1.00
Sat Flow, veh/h	1021	0	1586	381	98	1075	0	1046	6	94	1050	1652
Grp Volume(v), veh/h	16	0	11	214	0	0	867	0	0	1257	0	36
Grp Sat Flow(s),veh/h/ln	1021	0	1586	1554	0	0	1052	0	0	1145	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.3	8.0	0.0	0.0	39.0	0.0	0.0	39.0	0.0	0.0
Prop In Lane	1.00		1.00	0.31		0.69	0.02		0.01	0.11		1.00
Lane Grp Cap(c), veh/h	282	0	278	325	0	0	745	0	0	811	0	1101
V/C Ratio(X)	0.06	0.00	0.04	0.66	0.00	0.00	1.16	0.00	0.00	1.55	0.00	0.03
Avail Cap(c_a), veh/h	282	0	278	325	0	0	745	0	0	811	0	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	21.2	0.0	20.6	24.2	0.0	0.0	13.3	0.0	0.0	4.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	4.8	0.0	0.0	88.0	0.0	0.0	248.4	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(95%),veh/ln	0.4	0.0	0.2	6.0	0.0	0.0	34.2	0.0	0.0	82.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	20.6	29.0	0.0	0.0	101.3	0.0	0.0	252.7	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	F	A	A	F	A	A
Approach Vol, veh/h	27			214			867			1293		
Approach Delay, s/veh	21.0			29.0			101.3			245.6		
Approach LOS	C			C			F			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			15.0			45.0			15.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	41.0			2.8			41.0			10.0		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	171.7											
HCM 6th LOS	F											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	400	61	176	513	138	97	311	96	226	317	239
Future Volume (vph)	251	400	61	176	513	138	97	311	96	226	317	239
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1765	0	1604	1640	1442
Flt Permitted	0.108			0.521			0.394			0.123		
Satd. Flow (perm)	181	1791	1435	829	1697	1577	631	1765	0	208	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		12				246
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	259	412	63	181	529	142	100	420	0	233	327	246
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	61.1	61.1	61.1	38.6	38.6	38.6	36.1	27.4		46.6	32.6	32.6
Actuated g/C Ratio	0.51	0.51	0.51	0.32	0.32	0.32	0.30	0.23		0.39	0.27	0.27
v/c Ratio	0.89	0.45	0.08	0.68	0.97	0.23	0.39	1.02		0.96	0.73	0.43
Control Delay	59.8	20.4	1.0	53.0	75.1	9.4	29.8	95.0		47.3	36.2	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	59.8	20.4	1.0	53.0	75.1	9.4	29.8	95.0		47.3	36.2	6.1
LOS	E	C	A	D	E	A	C	F		D	D	A
Approach Delay		32.7			59.5			82.5			30.2	
Approach LOS		C			E			F			C	
Queue Length 50th (ft)	140	191	0	137	425	15	51	~354		141	214	27
Queue Length 95th (ft)	#291	274	8	221	#631	m51	91	#559		m112	m166	m12
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	297	932	795	272	558	625	257	411		243	445	570
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.87	0.44	0.08	0.67	0.95	0.23	0.39	1.02		0.96	0.73	0.43

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 48.7

Intersection LOS: D

Intersection Capacity Utilization 99.0%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

			
Ø1	Ø2	Ø3	Ø4 (R)
23 s	45 s	20 s	32 s
			
Ø6	Ø7	Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	251	400	61	176	513	138	97	311	96	226	317	239
Future Volume (veh/h)	251	400	61	176	513	138	97	311	96	226	317	239
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	259	412	33	181	529	0	100	321	98	233	327	175
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	305	882	754	331	550		309	402	123	308	504	427
Arrive On Green	0.13	0.48	0.48	0.62	0.62	0.00	0.07	0.25	0.25	0.12	0.30	0.30
Sat Flow, veh/h	1736	1823	1557	871	1766	1544	1880	1585	484	1616	1655	1402
Grp Volume(v), veh/h	259	412	33	181	529	0	100	0	419	233	327	175
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	871	1766	1544	1880	0	2069	1616	1655	1402
Q Serve(g_s), s	11.4	18.1	1.3	16.1	33.8	0.0	4.6	0.0	22.8	12.3	20.6	11.9
Cycle Q Clear(g_c), s	11.4	18.1	1.3	16.1	33.8	0.0	4.6	0.0	22.8	12.3	20.6	11.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	305	882	754	331	550		309	0	524	308	504	427
V/C Ratio(X)	0.85	0.47	0.04	0.55	0.96		0.32	0.00	0.80	0.76	0.65	0.41
Avail Cap(c_a), veh/h	339	950	811	347	581		327	0	524	308	504	427
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	20.6	16.3	18.6	21.9	0.0	30.4	0.0	42.0	29.5	36.2	33.2
Incr Delay (d2), s/veh	16.7	0.1	0.0	0.8	26.8	0.0	0.6	0.0	12.0	10.2	6.3	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(95%),veh/ln	9.8	11.7	0.8	4.0	16.8	0.0	3.9	0.0	19.5	9.3	13.9	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	20.8	16.3	19.4	48.7	0.0	31.0	0.0	54.1	39.7	42.5	36.0
LnGrp LOS	D	C	B	B	D		C	A	D	D	D	D
Approach Vol, veh/h		704			710			519			735	
Approach Delay, s/veh		29.1			41.2			49.6			40.1	
Approach LOS		C			D			D			D	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.7	42.9	20.0	36.4		63.6	13.9	42.6				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	13.9	36.3	14.8	24.8		20.6	7.1	23.1				
Green Ext Time (p_c), s	0.3	0.1	0.0	0.1		0.1	0.0	1.5				

Intersection Summary

HCM 6th Ctrl Delay	39.3
HCM 6th LOS	D

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	270	0	589	74	276	819	0
Future Volume (vph)	0	0	0	0	0	270	0	589	74	276	819	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1844	1567	1787	1881	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1844	1567	1787	1881	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	293	0	640	80	300	890	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	80.8%											
Analysis Period (min)	15											
	ICU Level of Service D											

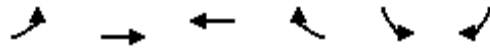
HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2031 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↖	↗	↖	↗	
Traffic Vol, veh/h	0	0	0	0	0	270	0	589	74	276	819	0
Future Vol, veh/h	0	0	0	0	0	270	0	589	74	276	819	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	293	0	640	80	300	890	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	890	-	-	640	890	0	0	720	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	342	0	0	500	761	-	-	732	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	342	-	-	500	761	-	-	732	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		21.9		0		3.4					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	761	-	-	-	500	732	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.587	0.41	-	-				
HCM Control Delay (s)	0	-	-	0	21.9	13.3	-	-				
HCM Lane LOS	A	-	-	A	C	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	3.7	2	-	-				

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

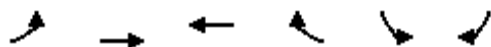
2031 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	239	483	460	111	164	403
Future Volume (vph)	239	483	460	111	164	403
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1748	1500	1676	1500
Flt Permitted	0.360				0.950	
Satd. Flow (perm)	635	1782	1748	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				123		315
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	3%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	266	537	511	123	182	448
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	13.0	82.0	69.0	69.0	38.0	13.0
Total Split (%)	10.8%	68.3%	57.5%	57.5%	31.7%	10.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	90.5	90.5	72.5	72.5	19.5	37.5
Actuated g/C Ratio	0.75	0.75	0.60	0.60	0.16	0.31
v/c Ratio	0.45	0.40	0.48	0.13	0.67	0.65
Control Delay	8.2	8.6	16.6	2.7	58.7	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	8.6	16.6	2.7	58.7	14.1
LOS	A	A	B	A	E	B
Approach Delay		8.4	13.9		27.0	
Approach LOS		A	B		C	
Queue Length 50th (ft)	86	192	209	0	134	82
Queue Length 95th (ft)	m120	m251	354	29	200	178
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	590	1343	1056	955	460	684

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2031 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.45	0.40	0.48	0.13	0.40	0.65

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 15.8

Intersection LOS: B

Intersection Capacity Utilization 61.6%

ICU Level of Service B

Analysis Period (min) 15

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

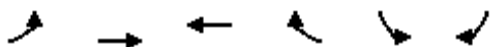
Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary

23: SR 0230 & Norlanco Dr

2031 Build
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	239	483	460	111	164	403
Future Volume (veh/h)	239	483	460	111	164	403
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	1772	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	266	537	511	123	182	448
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	3	2	2	2
Cap, veh/h	430	1146	938	801	464	513
Arrive On Green	0.13	1.00	0.53	0.53	0.28	0.28
Sat Flow, veh/h	1688	1786	1758	1502	1688	1502
Grp Volume(v), veh/h	266	537	511	123	182	448
Grp Sat Flow(s),veh/h/ln	1688	1786	1758	1502	1688	1502
Q Serve(g_s), s	8.0	0.0	23.0	5.0	10.5	33.0
Cycle Q Clear(g_c), s	8.0	0.0	23.0	5.0	10.5	33.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	430	1146	938	801	464	513
V/C Ratio(X)	0.62	0.47	0.55	0.15	0.39	0.87
Avail Cap(c_a), veh/h	430	1146	938	801	464	513
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	0.0	18.4	14.2	35.3	37.1
Incr Delay (d2), s/veh	2.7	1.4	2.3	0.4	0.5	15.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.3	0.8	14.2	3.1	7.9	20.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.8	1.4	20.7	14.6	35.9	52.3
LnGrp LOS	B	A	C	B	D	D
Approach Vol, veh/h		803	634		630	
Approach Delay, s/veh		7.1	19.5		47.6	
Approach LOS		A	B		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.0	69.0			82.0	38.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	63.0			76.0	32.0
Max Q Clear Time (g_c+I1), s	10.0	25.0			2.0	35.0
Green Ext Time (p_c), s	0.0	2.5			2.1	0.0

Intersection Summary

HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2031 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	600	524	91	75	1
Future Volume (vph)	6	600	524	91	75	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1756	0	1670	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1756	0	1670	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	625	641	0	79	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 44.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	600	524	91	75	1
Future Vol, veh/h	6	600	524	91	75	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	625	546	95	78	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	641	0	-	0	1231	594
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	637	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	746	-	-	-	188	516
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	554	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	746	-	-	-	186	516
Mov Cap-2 Maneuver	-	-	-	-	343	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	554	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		18.5		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	746	-	-	-	345	
HCM Lane V/C Ratio	0.008	-	-	-	0.229	
HCM Control Delay (s)	9.9	-	-	-	18.5	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.9	

Lanes, Volumes, Timings
31: Ridge Run Rd & Site Driveway

2031 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	36	33	64	40	0
Future Volume (vph)	0	36	33	64	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1735	1747	0
Flt Permitted				0.983		
Satd. Flow (perm)	1611	0	0	1735	1747	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	435			1319	1011	
Travel Time (s)	11.9			25.7	19.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	0	0	108	44	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
31: Ridge Run Rd & Site Driveway

2031 Build
PM Peak Hour

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	36	33	64	40	0
Future Vol, veh/h	0	36	33	64	40	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	0	2
Mvmt Flow	0	40	37	71	44	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	189	44	44	0	-	0
Stage 1	44	-	-	-	-	-
Stage 2	145	-	-	-	-	-
Critical Hdwy	6.42	6.2	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	926	1097	1168	-	-	-
Stage 1	1144	-	-	-	-	-
Stage 2	1024	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	895	1097	1168	-	-	-
Mov Cap-2 Maneuver	895	-	-	-	-	-
Stage 1	1106	-	-	-	-	-
Stage 2	1024	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	2.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1168	-	1097	-	-	
HCM Lane V/C Ratio	0.031	-	0.036	-	-	
HCM Control Delay (s)	8.2	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2031 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	84	79	4	53	77	34	333	6	109	394	63
Future Volume (vph)	93	84	79	4	53	77	34	333	6	109	394	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1385	0	0	1562	0	0	1673	0	0	1567	0
Flt Permitted		0.982			0.999			0.996			0.990	
Satd. Flow (perm)	0	1385	0	0	1562	0	0	1673	0	0	1567	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	267	0	0	139	0	0	388	0	0	590	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 85.8% ICU Level of Service E

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	64
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	93	84	79	4	53	77	34	333	6	109	394	63
Future Vol, veh/h	93	84	79	4	53	77	34	333	6	109	394	63
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	97	88	82	4	55	80	35	347	6	114	410	66
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	23.4	14.6	30.5	116.2
HCM LOS	C	B	D	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	36%	3%	19%
Vol Thru, %	89%	33%	40%	70%
Vol Right, %	2%	31%	57%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	373	256	134	566
LT Vol	34	93	4	109
Through Vol	333	84	53	394
RT Vol	6	79	77	63
Lane Flow Rate	389	267	140	590
Geometry Grp	1	1	1	1
Degree of Util (X)	0.762	0.597	0.298	1.158
Departure Headway (Hd)	7.435	8.533	8.203	7.073
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	490	427	441	513
Service Time	5.435	6.533	6.203	5.122
HCM Lane V/C Ratio	0.794	0.625	0.317	1.15
HCM Control Delay	30.5	23.4	14.6	116.2
HCM Lane LOS	D	C	B	F
HCM 95th-tile Q	6.6	3.8	1.2	20.6

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	774	85	172	670	92	170
Future Volume (vph)	774	85	172	670	92	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1841	0	1761	1958	1565	0
Flt Permitted			0.089		0.983	
Satd. Flow (perm)	1841	0	165	1958	1565	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	6					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	868	0	174	677	265	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	58.9		73.1	71.9	27.7	
Actuated g/C Ratio	0.54		0.66	0.65	0.25	
v/c Ratio	0.88		0.72	0.53	0.67	
Control Delay	35.6		26.5	13.7	45.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	35.6		26.5	13.7	45.1	
LOS	D		C	B	D	
Approach Delay	35.6			16.4	45.1	
Approach LOS	D			B	D	
Queue Length 50th (ft)	512		54	276	169	
Queue Length 95th (ft)	#890		m93	m418	235	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2031 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	988		240	1280	566	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.88		0.72	0.53	0.47	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 28.6

Intersection LOS: C

Intersection Capacity Utilization 86.9%

ICU Level of Service E

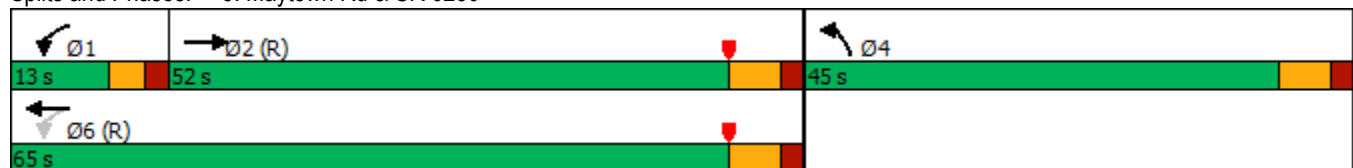
Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2031 Build
SAT Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	774	85	172	670	92	170
Future Volume (veh/h)	774	85	172	670	92	170
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	782	84	174	677	93	172
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	948	102	325	1464	118	219
Arrive On Green	0.61	0.60	0.04	0.47	0.20	0.20
Sat Flow, veh/h	1566	168	1927	2090	578	1069
Grp Volume(v), veh/h	0	866	174	677	266	0
Grp Sat Flow(s),veh/h/ln	0	1734	1927	2090	1653	0
Q Serve(g_s), s	0.0	43.4	3.4	24.1	16.8	0.0
Cycle Q Clear(g_c), s	0.0	43.4	3.4	24.1	16.8	0.0
Prop In Lane		0.10	1.00		0.35	0.65
Lane Grp Cap(c), veh/h	0	1049	325	1464	338	0
V/C Ratio(X)	0.00	0.83	0.53	0.46	0.79	0.00
Avail Cap(c_a), veh/h	0	1049	369	1464	598	0
HCM Platoon Ratio	1.00	1.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	17.2	19.1	15.1	41.8	0.0
Incr Delay (d2), s/veh	0.0	7.4	1.4	1.1	13.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	24.6	4.3	18.5	12.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	24.6	20.4	16.2	55.2	0.0
LnGrp LOS	A	C	C	B	E	A
Approach Vol, veh/h	866			851	266	
Approach Delay, s/veh	24.6			17.1	55.2	
Approach LOS	C			B	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.5	71.8		27.7		82.3
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	5.4	45.4		18.8		26.1
Green Ext Time (p_c), s	0.1	0.4		2.7		17.9
Intersection Summary						
HCM 6th Ctrl Delay			25.5			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1005	0	1	1012	122	0	0	1	70	0	37
Future Volume (vph)	17	1005	0	1	1012	122	0	0	1	70	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	1047	0	1	1181	0	0	1	0	73	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 77.9% ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	14.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	1005	0	1	1012	122	0	0	1	70	0	37
Future Vol, veh/h	17	1005	0	1	1012	122	0	0	1	70	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	1047	0	1	1054	127	0	0	1	73	0	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1181	0	0	1047	0	0	2222	2266	1047	2204	2203	1118
Stage 1	-	-	-	-	-	-	1083	1083	-	1120	1120	-
Stage 2	-	-	-	-	-	-	1139	1183	-	1084	1083	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	560	-	-	363	-	-	42	53	308	~ 49	65	289
Stage 1	-	-	-	-	-	-	328	334	-	333	343	-
Stage 2	-	-	-	-	-	-	306	303	-	348	354	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	560	-	-	363	-	-	35	51	308	~ 48	63	289
Mov Cap-2 Maneuver	-	-	-	-	-	-	35	51	-	~ 48	63	-
Stage 1	-	-	-	-	-	-	318	323	-	322	342	-
Stage 2	-	-	-	-	-	-	264	302	-	336	343	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	16.7	\$ 302.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	308	560	-	-	363	-	-	48	289
HCM Lane V/C Ratio	0.003	0.032	-	-	0.003	-	-	1.519	0.133
HCM Control Delay (s)	16.7	11.6	-	-	14.9	-	-	\$ 451.6	19.4
HCM Lane LOS	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	7	0.5

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	782	51	158	864	16	265	3	166	36	4	15
Future Volume (vph)	22	782	51	158	864	16	265	3	166	36	4	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1740	0
Flt Permitted	0.250			0.101			0.744			0.533		
Satd. Flow (perm)	434	1783	1584	167	1697	1573	1327	1574	0	988	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			175			16
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	823	54	166	909	17	279	178	0	38	20	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	56.7	56.7	56.7	75.3	74.0	74.0	25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.52	0.52	0.52	0.68	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.10	0.90	0.06	0.60	0.80	0.02	0.92	0.36		0.17	0.05	
Control Delay	19.5	33.1	3.5	30.7	14.2	2.4	76.4	7.6		35.7	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	19.5	33.1	3.5	30.7	14.2	2.4	76.4	7.6		35.7	16.9	
LOS	B	C	A	C	B	A	E	A		D	B	
Approach Delay		30.9			16.5			49.6			29.2	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	7	283	0	66	194	0	191	2		21	2	
Queue Length 95th (ft)	m14	m#778	m5	m122	380	m1	#346	57		51	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	223	918	855	337	1142	1068	314	506		234	425	
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	0.10	0.90	0.06	0.49	0.80	0.02	0.89	0.35		0.16	0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 28.0

Intersection LOS: C

Intersection Capacity Utilization 97.2%

ICU Level of Service F

Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2031 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	782	51	158	864	16	265	3	166	36	4	15
Future Volume (veh/h)	22	782	51	158	864	16	265	3	166	36	4	15
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	823	32	166	909	12	279	3	110	38	4	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	448	1171	997	532	1190	1056	387	10	358	294	125	282
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.22	0.22	0.21	0.22	0.22	0.21
Sat Flow, veh/h	668	2047	1743	1666	1736	1540	1488	45	1645	1385	576	1296
Grp Volume(v), veh/h	23	823	32	166	909	12	279	0	113	38	0	13
Grp Sat Flow(s),veh/h/ln	668	2047	1743	1666	1736	1540	1488	0	1690	1385	0	1871
Q Serve(g_s), s	0.0	0.0	0.0	4.2	0.0	0.0	19.9	0.0	6.2	2.6	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.2	0.0	0.0	20.0	0.0	6.2	8.3	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.69
Lane Grp Cap(c), veh/h	448	1171	997	532	1190	1056	387	0	367	294	0	407
V/C Ratio(X)	0.05	0.70	0.03	0.31	0.76	0.01	0.72	0.00	0.31	0.13	0.00	0.03
Avail Cap(c_a), veh/h	448	1171	997	676	1190	1056	417	0	401	322	0	444
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(l)	1.00	1.00	1.00	0.60	0.60	0.60	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.3	0.0	0.0	41.6	0.0	36.5	39.4	0.0	34.2
Incr Delay (d2), s/veh	0.2	3.5	0.1	0.2	2.9	0.0	5.5	0.0	0.5	0.2	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(95%),veh/ln	0.0	2.1	0.0	2.1	1.7	0.0	12.5	0.0	4.8	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	3.5	0.1	6.5	2.9	0.0	47.1	0.0	37.0	39.6	0.0	34.2
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	878		1087				392		51			
Approach Delay, s/veh	3.3		3.4				44.2		38.2			
Approach LOS	A		A				D		D			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	12.5	68.7	28.8		81.2		28.8					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25		72.2		* 25					
Max Q Clear Time (g_c+I1), s	6.7	2.5	10.8		2.5		22.5					
Green Ext Time (p_c), s	0.3	1.1	0.1		1.2		0.4					

Intersection Summary

HCM 6th Ctrl Delay 10.7
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	727	13	4	846	69	9	3	11	63	40	132
Future Volume (vph)	111	727	13	4	846	69	9	3	11	63	40	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1742	0	1744	1818	1561	0	1759	0	1719	1574	0
Flt Permitted	0.185			0.365				0.595		0.741		
Satd. Flow (perm)	326	1742	0	670	1818	1561	0	1067	0	1340	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				80		12			137	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	796	0	4	910	74	0	25	0	68	185	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.7	87.8		75.1	75.1	75.1		12.2		12.2	12.2	
Actuated g/C Ratio	0.81	0.80		0.68	0.68	0.68		0.11		0.11	0.11	
v/c Ratio	0.33	0.57		0.01	0.73	0.07		0.20		0.46	0.63	
Control Delay	6.6	8.0		5.5	15.9	1.0		31.2		54.7	23.6	
Queue Delay	0.0	0.0		0.0	0.3	0.0		0.0		0.0	0.0	
Total Delay	6.6	8.0		5.5	16.2	1.0		31.2		54.7	23.6	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		7.8			15.0			31.2			32.0	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	20	174		1	426	1		8		46	32	
Queue Length 95th (ft)	m33	m286		m2	695	m4		33		87	99	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	379	1391		457	1241	1091		236		285	442	
Starvation Cap Reductn	0	0		0	51	0		0		0	0	
Spillback Cap Reductn	0	13		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.31	0.58		0.01	0.76	0.07		0.11		0.24	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 14.1

Intersection LOS: B

Intersection Capacity Utilization 77.4%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
14 s	68 s	28 s
 Ø5 (R)		 Ø8
82 s		28 s

HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2031 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	727	13	4	846	69	9	3	11	63	40	132
Future Volume (veh/h)	111	727	13	4	846	69	9	3	11	63	40	132
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	119	782	12	4	910	61	10	3	8	68	43	71
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	526	1351	21	579	1395	1191	65	28	28	191	61	101
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09
Sat Flow, veh/h	1629	1667	26	712	1935	1652	172	283	280	1374	621	1025
Grp Volume(v), veh/h	119	0	794	4	910	61	21	0	0	68	0	114
Grp Sat Flow(s),veh/h/ln	1629	0	1692	712	1935	1652	735	0	0	1374	0	1646
Q Serve(g_s), s	1.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.4
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	5.8	0.0	7.4
Prop In Lane	1.00		0.02	1.00		1.00	0.48		0.38	1.00		0.62
Lane Grp Cap(c), veh/h	526	0	1371	579	1395	1191	114	0	0	191	0	162
V/C Ratio(X)	0.23	0.00	0.58	0.01	0.65	0.05	0.18	0.00	0.00	0.36	0.00	0.70
Avail Cap(c_a), veh/h	588	0	1371	579	1395	1191	279	0	0	348	0	350
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)	0.38	0.00	0.38	0.78	0.78	0.78	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.5	0.0	0.0	0.0	0.0	0.0	45.8	0.0	0.0	47.3	0.0	48.3
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.9	0.1	0.8	0.0	0.0	1.1	0.0	5.4
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(95%),veh/ln	0.7	0.0	0.5	0.0	1.3	0.0	1.0	0.0	0.0	3.3	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.6	0.0	0.7	0.0	1.9	0.1	46.5	0.0	0.0	48.4	0.0	53.8
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	913		975				21		182			
Approach Delay, s/veh	0.9		1.7				46.5		51.8			
Approach LOS	A		A				D		D			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.8	84.7	15.4		94.6		15.4					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.4	2.5	9.4		2.5		9.5					
Green Ext Time (p_c), s	0.1	1.3	0.5		1.0		0.0					
Intersection Summary												
HCM 6th Ctrl Delay			6.2									
HCM 6th LOS			A									

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	703	24	21	724	14	69	24	18	16	21	77
Future Volume (vph)	56	703	24	21	724	14	69	24	18	16	21	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1747	0	1620	1700	0	1541	1658	0	0	1823	0
Flt Permitted	0.315			0.321			0.528				0.951	
Satd. Flow (perm)	548	1747	0	547	1700	0	857	1658	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			1			19			81	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	765	0	22	777	0	73	44	0	0	120	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.3	86.3		86.3	86.3		13.8	13.8			13.8	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.13	0.13			0.13	
v/c Ratio	0.14	0.56		0.05	0.58		0.68	0.20			0.41	
Control Delay	6.4	9.2		4.0	7.6		74.7	28.5			20.4	
Queue Delay	0.0	0.1		0.0	0.2		0.0	0.0			0.0	
Total Delay	6.4	9.3		4.0	7.7		74.7	28.5			20.4	
LOS	A	A		A	A		E	C			C	
Approach Delay		9.1			7.6			57.3			20.4	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	13	224		3	176		50	16			25	
Queue Length 95th (ft)	m27	260		11	348		96	46			75	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	429	1370		429	1333		319	629			701	
Starvation Cap Reductn	0	83		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	92		0	0			4	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.14	0.59		0.05	0.63		0.23	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 12.2

Intersection LOS: B

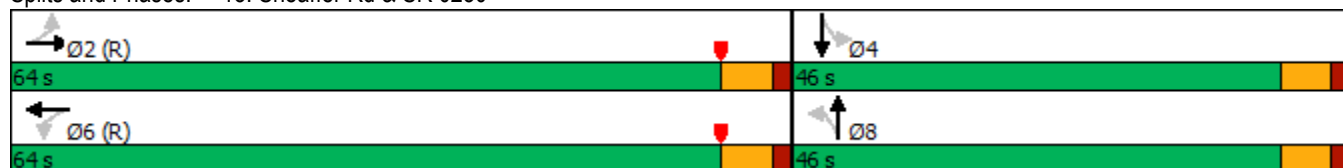
Intersection Capacity Utilization 71.1%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 13: Sheaffer Rd & SR 0230



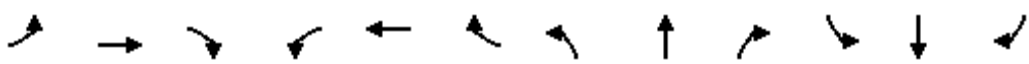
HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2031 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	703	24	21	724	14	69	24	18	16	21	77
Future Volume (veh/h)	56	703	24	21	724	14	69	24	18	16	21	77
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	59	740	20	22	762	14	73	25	7	17	22	34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	522	1397	38	664	1554	29	174	105	29	63	53	66
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	640	1682	45	721	1871	34	1240	1315	368	280	670	828
Grp Volume(v), veh/h	59	0	760	22	0	776	73	0	32	73	0	0
Grp Sat Flow(s),veh/h/ln	640	0	1728	721	0	1906	1240	0	1683	1778	0	0
Q Serve(g_s), s	1.6	0.0	0.0	0.6	0.0	12.8	1.2	0.0	2.0	1.9	0.0	0.0
Cycle Q Clear(g_c), s	14.4	0.0	0.0	0.6	0.0	12.8	5.4	0.0	2.0	4.3	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.22	0.23		0.47
Lane Grp Cap(c), veh/h	522	0	1434	664	0	1582	174	0	134	166	0	0
V/C Ratio(X)	0.11	0.00	0.53	0.03	0.00	0.49	0.42	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	522	0	1434	664	0	1582	537	0	627	675	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)	0.80	0.00	0.80	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.0	0.0	0.0	1.6	0.0	2.7	49.0	0.0	47.6	48.9	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.1	0.1	0.0	1.1	1.6	0.0	0.9	1.8	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(95%),veh/ln	0.1	0.0	0.8	0.1	0.0	5.2	3.6	0.0	1.5	3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.4	0.0	1.1	1.7	0.0	3.8	50.6	0.0	48.5	50.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	819		798				105				73	
Approach Delay, s/veh	1.1		3.7				50.0				50.7	
Approach LOS	A		A				D				D	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	96.2		13.8		96.2		13.8					
Change Period (Y+Rc), s	* 5.9		6.0		* 5.9		6.0					
Max Green Setting (Gmax), s	* 58		40.0		* 58		40.0					
Max Q Clear Time (g_c+I1), s	2.0		6.3		14.8		7.4					
Green Ext Time (p_c), s	32.3		0.2		28.5		0.3					
Intersection Summary												
HCM 6th Ctrl Delay			7.2									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↷	↷
Traffic Volume (vph)	0	0	0	548	1	61	342	172	0	0	191	28
Future Volume (vph)	0	0	0	548	1	61	342	172	0	0	191	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1640	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.952		0.465					
Satd. Flow (perm)	0	0	0	0	1640	1442	770	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	572	64	356	179	0	0	199	29
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					20.5	20.5	28.2	28.2			15.2	15.2
Actuated g/C Ratio					0.35	0.35	0.48	0.48			0.26	0.26
v/c Ratio					0.99	0.10	0.74	0.23			0.44	0.06
Control Delay					58.6	0.3	21.9	9.5			21.3	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					58.6	0.3	21.9	9.5			21.3	0.2
LOS					E	A	C	A			C	A
Approach Delay					52.8			17.7			18.7	
Approach LOS					D			B			B	
Queue Length 50th (ft)					195	0	77	34			58	0
Queue Length 95th (ft)					#396	0	#158	65			109	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					577	614	483	846			508	570
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					0.99	0.10	0.74	0.21			0.39	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.2

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 33.8

Intersection LOS: C

Intersection Capacity Utilization 122.3%

ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	548	1	61	342	172	0	0	191	28
Future Volume (veh/h)	0	0	0	548	1	61	342	172	0	0	191	28
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				571	1	0	356	179	0	0	199	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				643	1		521	799	0	0	435	
Arrive On Green				0.34	0.36	0.00	0.14	0.47	0.00	0.00	0.23	0.00
Sat Flow, veh/h				1782	3	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				572	0	0	356	179	0	0	199	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				16.8	0.0	0.0	8.0	3.5	0.0	0.0	5.1	0.0
Cycle Q Clear(g_c), s				16.8	0.0	0.0	8.0	3.5	0.0	0.0	5.1	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				645	0		521	799	0	0	435	
V/C Ratio(X)				0.89	0.00		0.68	0.22	0.00	0.00	0.46	
Avail Cap(c_a), veh/h				659	0		521	922	0	0	569	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.2	0.0	0.0	13.6	8.8	0.0	0.0	18.3	0.0
Incr Delay (d2), s/veh				13.7	0.0	0.0	3.7	0.5	0.0	0.0	2.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				13.6	0.0	0.0	5.6	2.0	0.0	0.0	4.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				30.9	0.0	0.0	17.3	9.3	0.0	0.0	21.0	0.0
LnGrp LOS				C	A		B	A	A	A	C	
Approach Vol, veh/h					572			535			199	
Approach Delay, s/veh					30.9			14.6			21.0	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		24.6				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		5.5			10.0	7.1		18.8				
Green Ext Time (p_c), s		3.6			0.0	2.1		0.3				
Intersection Summary												
HCM 6th Ctrl Delay					22.7							
HCM 6th LOS					C							
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings

2031 Build

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	355	0	0	0	0	482	544	90	652	0
Future Volume (vph)	24	0	355	0	0	0	0	482	544	90	652	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1672	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1672	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	382	0	0	0	0	1103	0	97	701	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	122.3%						ICU Level of Service H					
Analysis Period (min)	15											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2031 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	24	0	355	0	0	0	0	482	544	90	652	0
Future Vol, veh/h	24	0	355	0	0	0	0	482	544	90	652	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	26	0	382	0	0	0	0	518	585	97	701	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1413	1413	701	-	0	0	518	0	0
Stage 1	895	895	-	-	-	-	-	-	-
Stage 2	518	518	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	151	176	488	0	-	-	843	-	0
Stage 1	489	420	-	0	-	-	-	-	0
Stage 2	708	585	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	134	0	488	-	-	-	843	-	-
Mov Cap-2 Maneuver	134	0	-	-	-	-	-	-	-
Stage 1	489	0	-	-	-	-	-	-	-
Stage 2	627	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34.4	0	1.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	134	488	843	-
HCM Lane V/C Ratio	-	-	0.193	0.782	0.115	-
HCM Control Delay (s)	-	-	38.2	34.1	9.8	-
HCM Lane LOS	-	-	E	D	A	-
HCM 95th %tile Q(veh)	-	-	0.7	7	0.4	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2031 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	12	14	998	1023	3
Future Volume (vph)	6	12	14	998	1023	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1557	0	0	1800	1799	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1557	0	0	1800	1799	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	0	1077	1091	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	73.7%			ICU Level of Service D		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	12	14	998	1023	3
Future Vol, veh/h	6	12	14	998	1023	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	13	15	1062	1088	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2182	1090	1091	0	-	0
Stage 1	1090	-	-	-	-	-
Stage 2	1092	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	48	274	560	-	-	-
Stage 1	325	-	-	-	-	-
Stage 2	325	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	45	274	560	-	-	-
Mov Cap-2 Maneuver	45	-	-	-	-	-
Stage 1	304	-	-	-	-	-
Stage 2	325	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48.3	0.2	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	560	-	102	-	-
HCM Lane V/C Ratio	0.027	-	0.188	-	-
HCM Control Delay (s)	11.6	0	48.3	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	24	105	12	22	34	77	833	8	20	838	187
Future Volume (vph)	157	24	105	12	22	34	77	833	8	20	838	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1647	0	1572	1634	0	1620	1713	0	1550	1713	0
Flt Permitted	0.719			0.670			0.109			0.178		
Satd. Flow (perm)	1226	1647	0	1109	1634	0	186	1713	0	290	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		111			36			1			32	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	165	136	0	13	59	0	81	885	0	21	1079	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.9	12.9		12.9	12.9		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.61	0.61		0.61	0.61	
v/c Ratio	0.63	0.31		0.05	0.16		0.72	0.85		0.12	1.02	
Control Delay	32.1	8.2		18.0	10.9		43.9	18.4		7.8	49.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	32.1	8.2		18.0	10.9		43.9	18.4		7.8	49.1	
LOS	C	A		B	B		D	B		A	D	
Approach Delay		21.3			12.2			20.5			48.3	
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	53	7		4	6		23	292		3	~439	
Queue Length 95th (ft)	106	43		15	30		m#58	#531		13	#665	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	495		277	435		113	1046		177	1058	
Starvation Cap Reductn	0	0		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	0.54	0.27		0.05	0.14		0.72	0.85		0.12	1.02	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 32.9

Intersection LOS: C

Intersection Capacity Utilization 92.1%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

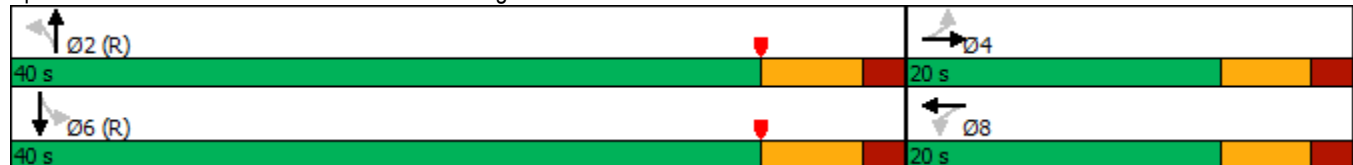
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2031 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	24	105	12	22	34	77	833	8	20	838	187
Future Volume (veh/h)	157	24	105	12	22	34	77	833	8	20	838	187
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	165	25	84	13	23	22	81	877	7	21	882	163
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	355	78	261	281	159	153	223	1182	9	272	1014	187
Arrive On Green	0.19	0.19	0.17	0.19	0.19	0.17	0.43	0.43	0.42	0.64	0.64	0.62
Sat Flow, veh/h	1435	416	1398	1202	855	818	552	1852	15	631	1588	294
Grp Volume(v), veh/h	165	0	109	13	0	45	81	0	884	21	0	1045
Grp Sat Flow(s),veh/h/ln	1435	0	1814	1202	0	1673	552	0	1866	631	0	1882
Q Serve(g_s), s	6.5	0.0	3.2	0.6	0.0	1.4	8.5	0.0	23.8	1.6	0.0	27.1
Cycle Q Clear(g_c), s	7.9	0.0	3.2	3.7	0.0	1.4	35.7	0.0	23.8	25.4	0.0	27.1
Prop In Lane	1.00		0.77	1.00		0.49	1.00		0.01	1.00		0.16
Lane Grp Cap(c), veh/h	355	0	338	281	0	312	223	0	1192	272	0	1202
V/C Ratio(X)	0.46	0.00	0.32	0.05	0.00	0.14	0.36	0.00	0.74	0.08	0.00	0.87
Avail Cap(c_a), veh/h	446	0	454	357	0	418	223	0	1192	272	0	1202
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.61	0.00	0.61	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	21.5	22.7	0.0	20.6	29.6	0.0	13.0	17.9	0.0	8.9
Incr Delay (d2), s/veh	0.9	0.0	0.5	0.1	0.0	0.2	2.8	0.0	2.6	0.6	0.0	8.7
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(95%),veh/ln	3.8	0.0	2.3	0.3	0.0	0.9	2.3	0.0	14.4	0.4	0.0	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	0.0	22.0	22.8	0.0	20.8	32.4	0.0	15.6	18.4	0.0	17.6
LnGrp LOS	C	A	C	C	A	C	C	A	B	B	A	B
Approach Vol, veh/h	274			58			965			1066		
Approach Delay, s/veh	23.6			21.3			17.0			17.6		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.8			16.2			43.8			16.2		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	25.8			9.9			29.1			5.7		
Green Ext Time (p_c), s	6.9			0.4			4.2			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	18.2											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	13	24	0	149	16	766	7	164	808	7
Future Volume (vph)	5	1	13	24	0	149	16	766	7	164	808	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1596	0	0	1670	0	0	1715	1648
Flt Permitted		0.708			0.950			0.975			0.762	
Satd. Flow (perm)	0	1232	1581	0	1527	0	0	1630	0	0	1317	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		157			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	14	0	182	0	0	830	0	0	1024	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.4	8.4		8.4			42.1			42.1	42.1
Actuated g/C Ratio		0.14	0.14		0.14			0.70			0.70	0.70
v/c Ratio		0.03	0.05		0.52			0.73			1.11	0.01
Control Delay		21.2	0.4		11.9			11.3			71.4	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		21.2	0.4		11.9			11.3			71.4	0.0
LOS		C	A		B			B			E	A
Approach Delay		6.6			11.9			11.3			71.0	
Approach LOS		A			B			B			E	
Queue Length 50th (ft)		2	0		8			130			~457	0
Queue Length 95th (ft)		10	0		54			#353			m#502	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		236	347		419			1142			923	1168
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		0.03	0.04		0.43			0.73			1.11	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 41.1

Intersection LOS: D

Intersection Capacity Utilization 128.3%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

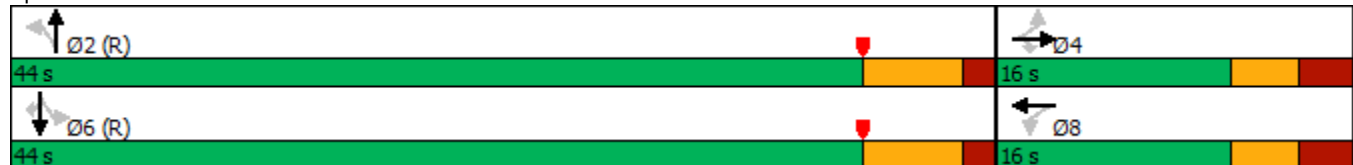
Queue shown is maximum after two cycles.

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	13	24	0	149	16	766	7	164	808	7
Future Volume (veh/h)	5	1	13	24	0	149	16	766	7	164	808	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	7	25	0	153	17	806	7	173	851	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	258	43	245	90	13	211	61	741	6	151	528	1135
Arrive On Green	0.14	0.15	0.15	0.14	0.00	0.14	0.67	0.69	0.67	1.00	1.00	1.00
Sat Flow, veh/h	956	278	1586	139	84	1361	0	1079	9	118	768	1652
Grp Volume(v), veh/h	6	0	7	178	0	0	830	0	0	1024	0	7
Grp Sat Flow(s),veh/h/ln	1234	0	1586	1584	0	0	1088	0	0	886	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	6.5	0.0	0.0	40.2	0.0	0.0	40.2	0.0	0.0
Prop In Lane	0.83		1.00	0.14		0.86	0.02		0.01	0.17		1.00
Lane Grp Cap(c), veh/h	280	0	245	287	0	0	791	0	0	664	0	1135
V/C Ratio(X)	0.02	0.00	0.03	0.62	0.00	0.00	1.05	0.00	0.00	1.54	0.00	0.01
Avail Cap(c_a), veh/h	327	0	304	345	0	0	791	0	0	664	0	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	21.9	0.0	21.5	24.6	0.0	0.0	14.4	0.0	0.0	5.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.4	0.0	0.0	45.8	0.0	0.0	244.7	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(95%),veh/ln	0.1	0.0	0.2	4.7	0.0	0.0	25.4	0.0	0.0	67.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	21.6	27.1	0.0	0.0	60.2	0.0	0.0	250.1	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	F	A	A	F	A	A
Approach Vol, veh/h	13			178			830			1031		
Approach Delay, s/veh	21.7			27.1			60.2			248.4		
Approach LOS	C			C			E			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	46.2			13.8			46.2			13.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	42.2			2.2			42.2			8.5		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	151.6											
HCM 6th LOS	F											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	458	57	190	540	140	73	200	133	131	154	153
Future Volume (vph)	250	458	57	190	540	140	73	200	133	131	154	153
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1782	0	1558	1624	1499
Flt Permitted	0.164			0.495			0.657			0.306		
Satd. Flow (perm)	271	1809	1435	796	1731	1592	1200	1782	0	502	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255			42			247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	255	467	58	194	551	143	74	340	0	134	157	156
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	32.5	32.5	32.5	18.8	18.8	18.8	21.9	15.9		22.0	16.0	16.0
Actuated g/C Ratio	0.46	0.46	0.46	0.27	0.27	0.27	0.31	0.22		0.31	0.23	0.23
v/c Ratio	0.93	0.56	0.08	0.92	1.20	0.23	0.17	0.79		0.49	0.43	0.29
Control Delay	60.6	18.9	0.2	76.3	138.1	0.9	14.6	37.9		20.8	28.6	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	60.6	18.9	0.2	76.3	138.1	0.9	14.6	37.9		20.8	28.6	2.0
LOS	E	B	A	E	F	A	B	D		C	C	A
Approach Delay		31.2			102.5			33.7			17.0	
Approach LOS		C			F			C			B	
Queue Length 50th (ft)	~79	162	0	90	~333	0	20	130		38	62	0
Queue Length 95th (ft)	#221	256	0	#217	#517	0	44	#252		73	116	8
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	274	831	746	211	459	610	434	479		278	408	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.93	0.56	0.08	0.92	1.20	0.23	0.17	0.71		0.48	0.38	0.28

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 70.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 54.1

Intersection LOS: D

Intersection Capacity Utilization 91.1%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	458	57	190	540	140	73	200	133	131	154	153
Future Volume (veh/h)	250	458	57	190	540	140	73	200	133	131	154	153
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	255	467	52	194	551	0	74	204	133	134	157	74
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	292	817	693	310	462		456	254	166	318	410	362
Arrive On Green	0.11	0.44	0.44	0.51	0.51	0.00	0.06	0.21	0.19	0.11	0.25	0.25
Sat Flow, veh/h	1723	1837	1557	820	1794	1557	2069	1235	805	1576	1641	1450
Grp Volume(v), veh/h	255	467	52	194	551	0	74	0	337	134	157	74
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	820	1794	1557	2069	0	2041	1576	1641	1450
Q Serve(g_s), s	7.5	13.6	1.4	15.8	18.5	0.0	2.0	0.0	11.3	4.6	5.7	2.9
Cycle Q Clear(g_c), s	7.5	13.6	1.4	15.9	18.5	0.0	2.0	0.0	11.3	4.6	5.7	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	292	817	693	310	462		456	0	420	318	410	362
V/C Ratio(X)	0.87	0.57	0.08	0.63	1.19		0.16	0.00	0.80	0.42	0.38	0.20
Avail Cap(c_a), veh/h	292	817	693	310	462		558	0	496	327	410	362
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	14.9	11.5	16.9	17.5	0.0	20.0	0.0	27.4	19.6	22.4	21.3
Incr Delay (d2), s/veh	24.1	0.6	0.0	3.0	106.8	0.0	0.2	0.0	7.9	0.9	0.6	0.3
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(95%),veh/ln	7.9	8.5	0.8	3.5	27.2	0.0	1.7	0.0	10.4	2.9	3.8	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	15.5	11.5	19.9	124.3	0.0	20.2	0.0	35.3	20.5	23.0	21.6
LnGrp LOS	D	B	B	B	F		C	A	D	C	C	C
Approach Vol, veh/h		774			745			411			365	
Approach Delay, s/veh		24.0			97.1			32.5			21.8	
Approach LOS		C			F			C			C	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	24.0	13.6	20.8		37.5	10.5	24.0				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	10.0	21.0	7.1	13.3		16.1	4.5	8.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5		0.2	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	48.9
HCM 6th LOS	D

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	328	0	464	84	355	436	0
Future Volume (vph)	0	0	0	0	0	328	0	464	84	355	436	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	0		150	325		0
Storage Lanes	0		1	0		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1863	0	0	1611	0	1844	1567	1787	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	1863	0	0	1611	0	1844	1567	1787	1863	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	364	0	516	93	394	484	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.0%

ICU Level of Service A

Analysis Period (min) 15

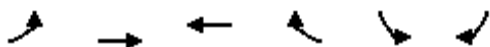
HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2031 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↰			↰		↰	↰	↰	↰	
Traffic Vol, veh/h	0	0	0	0	0	328	0	464	84	355	436	0
Future Vol, veh/h	0	0	0	0	0	328	0	464	84	355	436	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	150	325	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	0	0	0	364	0	516	93	394	484	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	484	-	-	516	484	0	0	609	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	583	0	0	590	1079	-	-	791	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	583	-	-	590	1079	-	-	791	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		20.5		0		6.3					
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1079	-	-	-	590	791	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.618	0.499	-	-				
HCM Control Delay (s)	0	-	-	0	20.5	14	-	-				
HCM Lane LOS	A	-	-	A	C	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	4.2	2.8	-	-				

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

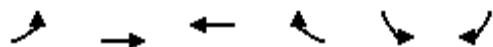
2031 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	324	397	485	153	185	433
Future Volume (vph)	324	397	485	153	185	433
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1782	1500	1676	1500
Flt Permitted	0.243				0.950	
Satd. Flow (perm)	429	1782	1782	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				170		186
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	360	441	539	170	206	481
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	20.0	55.0	35.0	35.0	20.0	20.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	C-Max	C-Max	None	None
Act Effct Green (s)	51.3	51.3	32.9	32.9	13.7	32.1
Actuated g/C Ratio	0.68	0.68	0.44	0.44	0.18	0.43
v/c Ratio	0.70	0.36	0.69	0.23	0.68	0.64
Control Delay	14.3	6.3	24.0	3.5	40.1	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	6.3	24.0	3.5	40.1	13.9
LOS	B	A	C	A	D	B
Approach Delay		9.9	19.1		21.7	
Approach LOS		A	B		C	
Queue Length 50th (ft)	61	77	209	0	88	91
Queue Length 95th (ft)	131	123	#339	34	156	185
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	543	1220	782	754	335	775

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2031 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.66	0.36	0.69	0.23	0.61	0.62

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 16.5

Intersection LOS: B

Intersection Capacity Utilization 69.2%

ICU Level of Service C

Analysis Period (min) 15

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

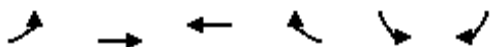
Queue shown is maximum after two cycles.

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2031 Build
SAT Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	324	397	485	153	185	433
Future Volume (veh/h)	324	397	485	153	185	433
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	1772	1786	1786	1772	1772	1772
Adj Flow Rate, veh/h	360	441	539	170	206	481
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	1	2	2	2
Cap, veh/h	497	1191	806	678	338	524
Arrive On Green	0.15	0.67	0.45	0.45	0.20	0.20
Sat Flow, veh/h	1688	1786	1786	1502	1688	1502
Grp Volume(v), veh/h	360	441	539	170	206	481
Grp Sat Flow(s),veh/h/ln	1688	1786	1786	1502	1688	1502
Q Serve(g_s), s	7.6	8.2	17.8	5.3	8.3	15.0
Cycle Q Clear(g_c), s	7.6	8.2	17.8	5.3	8.3	15.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	497	1191	806	678	338	524
V/C Ratio(X)	0.72	0.37	0.67	0.25	0.61	0.92
Avail Cap(c_a), veh/h	584	1191	806	678	338	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	5.5	16.2	12.7	27.3	23.4
Incr Delay (d2), s/veh	3.7	0.9	4.4	0.9	3.2	21.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.4	4.1	11.4	3.0	6.5	16.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.6	6.4	20.5	13.6	30.5	44.8
LnGrp LOS	B	A	C	B	C	D
Approach Vol, veh/h		801	709		687	
Approach Delay, s/veh		10.5	18.9		40.5	
Approach LOS		B	B		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	16.1	38.9			55.0	20.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	14.0	29.0			49.0	14.0
Max Q Clear Time (g_c+I1), s	9.6	19.8			10.2	17.0
Green Ext Time (p_c), s	0.6	2.0			1.6	0.0
Intersection Summary						
HCM 6th Ctrl Delay			22.6			
HCM 6th LOS			C			

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2031 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	51	34	16	34	79	20	281	7	53	277	53
Future Volume (vph)	58	51	34	16	34	79	20	281	7	53	277	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1673	0	0	1612	0	0	1778	0	0	1847	0
Flt Permitted		0.980			0.994			0.997			0.993	
Satd. Flow (perm)	0	1673	0	0	1612	0	0	1778	0	0	1847	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	0	0	134	0	0	321	0	0	399	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	56.0%											
Analysis Period (min)	15											
	ICU Level of Service B											

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

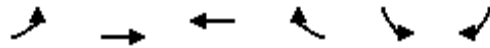
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	58	51	34	16	34	79	20	281	7	53	277	53
Future Vol, veh/h	58	51	34	16	34	79	20	281	7	53	277	53
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	60	53	35	17	35	82	21	293	7	55	289	55
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.3	10.4	13.6	15.1
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	41%	12%	14%
Vol Thru, %	91%	36%	26%	72%
Vol Right, %	2%	24%	61%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	308	143	129	383
LT Vol	20	58	16	53
Through Vol	281	51	34	277
RT Vol	7	34	79	53
Lane Flow Rate	321	149	134	399
Geometry Grp	1	1	1	1
Degree of Util (X)	0.485	0.254	0.215	0.576
Departure Headway (Hd)	5.44	6.131	5.763	5.202
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	661	582	619	690
Service Time	3.495	4.199	3.834	3.254
HCM Lane V/C Ratio	0.486	0.256	0.216	0.578
HCM Control Delay	13.6	11.3	10.4	15.1
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	2.7	1	0.8	3.7

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2031 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	541	587	85	89	3
Future Volume (vph)	3	541	587	85	89	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1781	0	1668	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1754	1828	1781	0	1668	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	564	700	0	96	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 47.8% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	541	587	85	89	3
Future Vol, veh/h	3	541	587	85	89	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	564	611	89	93	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	700	0	-	0	1226	656
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	570	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	714	-	-	-	189	474
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	714	-	-	-	188	474
Mov Cap-2 Maneuver	-	-	-	-	345	-
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	602	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		19.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	714	-	-	-	348	
HCM Lane V/C Ratio	0.004	-	-	-	0.275	
HCM Control Delay (s)	10.1	-	-	-	19.2	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	1.1	

Lanes, Volumes, Timings
34: Ridge Run Rd & Site Driveway

2031 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	46	50	38	36	0
Future Volume (vph)	0	46	50	38	36	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1730	1747	0
Flt Permitted				0.972		
Satd. Flow (perm)	1611	0	0	1730	1747	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			1310	976	
Travel Time (s)	15.6			25.5	19.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	51	0	0	98	40	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.4%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	46	50	38	36	0
Future Vol, veh/h	0	46	50	38	36	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	2
Mvmt Flow	0	51	56	42	40	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	194	40	40	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	154	-	-	-	-	-
Critical Hdwy	6.42	6.22	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	920	1103	1171	-	-	-
Stage 1	1149	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	875	1103	1171	-	-	-
Mov Cap-2 Maneuver	875	-	-	-	-	-
Stage 1	1093	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	4.7		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1171	-	1103	-	-	
HCM Lane V/C Ratio	0.047	-	0.046	-	-	
HCM Control Delay (s)	8.2	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

APPENDIX L13

2031 BUILD WITH IMPROVEMENTS CONDITION ANALYSES

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	458	57	190	540	140	73	200	133	131	154	153
Future Volume (vph)	250	458	57	190	540	140	73	200	133	131	154	153
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1782	0	1558	1624	1499
Flt Permitted	0.127			0.495			0.657			0.231		
Satd. Flow (perm)	210	1809	1435	796	1731	1592	1200	1782	0	379	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		37				232
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1025			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	255	467	58	194	551	143	74	340	0	134	157	156
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	14.0		14.0	14.0	14.0
Total Split (s)	13.5	45.0	45.0	31.5	31.5	31.5	14.0	21.0		14.0	21.0	21.0
Total Split (%)	16.9%	56.3%	56.3%	39.4%	39.4%	39.4%	17.5%	26.3%		17.5%	26.3%	26.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	39.5	39.5	39.5	26.0	26.0	26.0	22.7	15.0		24.2	17.8	17.8
Actuated g/C Ratio	0.49	0.49	0.49	0.33	0.33	0.33	0.28	0.19		0.30	0.22	0.22
v/c Ratio	1.07	0.52	0.07	0.75	0.98	0.21	0.19	0.93		0.58	0.43	0.30
Control Delay	97.8	16.4	0.2	44.9	62.4	0.9	18.6	64.1		29.7	33.1	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	97.8	16.4	0.2	44.9	62.4	0.9	18.6	64.1		29.7	33.1	2.6
LOS	F	B	A	D	E	A	B	E		C	C	A
Approach Delay		41.8			48.7			56.0			21.4	
Approach LOS		D			D			E			C	
Queue Length 50th (ft)	~97	151	0	86	270	0	24	152		46	71	0
Queue Length 95th (ft)	#241	235	0	#194	#473	3	52	#311		#90	130	14
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	239	894	785	258	563	678	398	364		232	361	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.07	0.52	0.07	0.75	0.98	0.21	0.19	0.93		0.58	0.43	0.30

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 79.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 42.9

Intersection LOS: D

Intersection Capacity Utilization 91.1%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	31.5 s	14 s	21 s
 Ø6		 Ø7	 Ø8
45 s		14 s	21 s

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2031 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	458	57	190	540	140	73	200	133	131	154	153
Future Volume (veh/h)	250	458	57	190	540	140	73	200	133	131	154	153
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	255	467	52	194	551	0	74	204	133	134	157	74
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	299	906	768	353	581		410	232	151	279	373	330
Arrive On Green	0.10	0.49	0.49	0.65	0.65	0.00	0.06	0.19	0.18	0.10	0.23	0.23
Sat Flow, veh/h	1723	1837	1557	820	1794	1557	2069	1235	805	1576	1641	1450
Grp Volume(v), veh/h	255	467	52	194	551	0	74	0	337	134	157	74
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	820	1794	1557	2069	0	2041	1576	1641	1450
Q Serve(g_s), s	7.6	13.8	1.4	12.9	22.4	0.0	2.2	0.0	12.8	5.3	6.5	3.3
Cycle Q Clear(g_c), s	7.6	13.8	1.4	13.2	22.4	0.0	2.2	0.0	12.8	5.3	6.5	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	299	906	768	353	581		410	0	383	279	373	330
V/C Ratio(X)	0.85	0.52	0.07	0.55	0.95		0.18	0.00	0.88	0.48	0.42	0.22
Avail Cap(c_a), veh/h	299	908	770	354	584		492	0	383	279	373	330
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	13.8	10.6	11.9	13.4	0.0	23.5	0.0	31.8	23.3	26.4	25.1
Incr Delay (d2), s/veh	20.5	0.2	0.0	1.0	24.6	0.0	0.2	0.0	20.2	1.3	0.8	0.3
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(95%),veh/ln	7.6	8.5	0.8	2.6	12.5	0.0	2.0	0.0	13.1	3.5	4.5	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.2	14.0	10.6	13.0	38.0	0.0	23.7	0.0	52.0	24.5	27.1	25.5
LnGrp LOS	D	B	B	B	D		C	A	D	C	C	C
Approach Vol, veh/h	774			745			411			365		
Approach Delay, s/veh	22.1			31.5			46.9			25.8		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	31.4	14.0	21.0		44.9	10.8	24.2				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	25.0	7.0	14.0		38.5	7.0	14.0				
Max Q Clear Time (g_c+I1), s	10.1	24.9	7.8	14.8		16.3	4.7	9.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0		0.2	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	23	35	6	44	123	47	343	9	32	192	79
Future Volume (vph)	70	23	35	6	44	123	47	343	9	32	192	79
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1233	0	0	1456	0	0	1577	0	0	1434	0
Flt Permitted		0.803			0.985			0.931			0.934	
Satd. Flow (perm)	0	1017	0	0	1437	0	0	1477	0	0	1346	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		31			128			3			47	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	180	0	0	415	0	0	315	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.0	22.0		22.0	22.0	
Total Split (s)	22.0	22.0		22.0	22.0		38.0	38.0		38.0	38.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		10.9			10.9			22.8			22.8	
Actuated g/C Ratio		0.28			0.28			0.58			0.58	
v/c Ratio		0.44			0.37			0.49			0.40	
Control Delay		16.1			7.8			10.3			8.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.1			7.8			10.3			8.2	
LOS		B			A			B			A	
Approach Delay		16.1			7.8			10.3			8.2	
Approach LOS		B			A			B			A	
Queue Length 50th (ft)		16			8			57			34	
Queue Length 95th (ft)		69			51			153			100	
Internal Link Dist (ft)		1077			1324			919			946	
Turn Bay Length (ft)												
Base Capacity (vph)		479			723			1248			1144	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.28			0.25			0.33			0.28	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 39.6

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 10.0

Intersection LOS: A

Intersection Capacity Utilization 61.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
38 s	22 s
 Ø6	 Ø8
38 s	22 s

HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	23	35	6	44	123	47	343	9	32	192	79
Future Volume (veh/h)	70	23	35	6	44	123	47	343	9	32	192	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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	73	24	36	6	46	128	49	357	9	33	200	82
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	372	90	92	148	91	240	196	580	14	186	450	170
Arrive On Green	0.18	0.22	0.18	0.18	0.22	0.18	0.36	0.40	0.36	0.36	0.40	0.36
Sat Flow, veh/h	720	409	419	27	415	1089	105	1462	35	85	1133	429
Grp Volume(v), veh/h	133	0	0	180	0	0	415	0	0	315	0	0
Grp Sat Flow(s),veh/h/ln	1548	0	0	1531	0	0	1602	0	0	1647	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	2.8	0.0	0.0	5.6	0.0	0.0	3.7	0.0	0.0
Prop In Lane	0.55		0.27	0.03		0.71	0.12		0.02	0.10		0.26
Lane Grp Cap(c), veh/h	495	0	0	421	0	0	728	0	0	743	0	0
V/C Ratio(X)	0.27	0.00	0.00	0.43	0.00	0.00	0.57	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	1060	0	0	1078	0	0	2071	0	0	2098	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.0	0.0	0.0	9.4	0.0	0.0	6.4	0.0	0.0	6.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.0	0.0	0.7	0.0	0.0	0.4	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(95%),veh/ln	0.8	0.0	0.0	1.2	0.0	0.0	2.2	0.0	0.0	1.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	0.0	0.0	10.1	0.0	0.0	7.1	0.0	0.0	6.4	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		133			180			415			315	
Approach Delay, s/veh		9.3			10.1			7.1			6.4	
Approach LOS		A			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.4		10.7		15.4		10.7				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		32.0		16.0		32.0		16.0				
Max Q Clear Time (g_c+I1), s		7.6		3.8		5.7		4.8				
Green Ext Time (p_c), s		1.8		0.3		1.4		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				7.7								
HCM 6th LOS				A								

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	84	79	4	53	77	34	333	6	109	394	63
Future Volume (vph)	93	84	79	4	53	77	34	333	6	109	394	63
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1312	0	0	1480	0	0	1585	0	0	1485	0
Flt Permitted		0.846			0.990			0.925			0.851	
Satd. Flow (perm)	0	1130	0	0	1467	0	0	1472	0	0	1276	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		28			80			2			14	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	267	0	0	139	0	0	388	0	0	590	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	27.0	27.0		27.0	27.0		53.0	53.0		53.0	53.0	
Total Split (%)	33.8%	33.8%		33.8%	33.8%		66.3%	66.3%		66.3%	66.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		19.4			19.4			37.0			37.0	
Actuated g/C Ratio		0.29			0.29			0.55			0.55	
v/c Ratio		0.77			0.29			0.48			0.83	
Control Delay		38.8			12.6			11.2			23.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		38.8			12.6			11.2			23.9	
LOS		D			B			B			C	
Approach Delay		38.8			12.6			11.3			23.9	
Approach LOS		D			B			B			C	
Queue Length 50th (ft)		91			18			95			193	
Queue Length 95th (ft)		#240			66			156			#347	
Internal Link Dist (ft)		1066			1154			917			948	
Turn Bay Length (ft)												
Base Capacity (vph)		406			556			1092			950	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.66			0.25			0.36			0.62	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 66.9

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 22.1

Intersection LOS: C

Intersection Capacity Utilization 92.5%

ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave



HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	84	79	4	53	77	34	333	6	109	394	63
Future Volume (veh/h)	93	84	79	4	53	77	34	333	6	109	394	63
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	97	88	82	4	55	80	35	347	6	114	410	66
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	243	159	120	103	168	233	138	731	12	218	567	85
Arrive On Green	0.23	0.26	0.23	0.23	0.26	0.23	0.45	0.48	0.45	0.45	0.48	0.45
Sat Flow, veh/h	435	615	466	15	652	905	69	1538	25	218	1194	178
Grp Volume(v), veh/h	267	0	0	139	0	0	388	0	0	590	0	0
Grp Sat Flow(s),veh/h/ln	1517	0	0	1572	0	0	1633	0	0	1590	0	0
Q Serve(g_s), s	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0
Cycle Q Clear(g_c), s	5.9	0.0	0.0	2.8	0.0	0.0	6.0	0.0	0.0	11.6	0.0	0.0
Prop In Lane	0.36		0.31	0.03		0.58	0.09		0.02	0.19		0.11
Lane Grp Cap(c), veh/h	482	0	0	462	0	0	837	0	0	828	0	0
V/C Ratio(X)	0.55	0.00	0.00	0.30	0.00	0.00	0.46	0.00	0.00	0.71	0.00	0.00
Avail Cap(c_a), veh/h	953	0	0	974	0	0	2073	0	0	2040	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.7	0.0	0.0	11.6	0.0	0.0	6.8	0.0	0.0	8.2	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	1.2	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(95%),veh/ln	3.1	0.0	0.0	1.5	0.0	0.0	3.0	0.0	0.0	5.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	0.0	0.0	12.0	0.0	0.0	7.2	0.0	0.0	9.3	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		267			139			388			590	
Approach Delay, s/veh		13.7			12.0			7.2			9.3	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.8		14.7		22.8		14.7				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		47.0		21.0		47.0		21.0				
Max Q Clear Time (g_c+I1), s		8.0		7.9		13.6		4.8				
Green Ext Time (p_c), s		1.8		0.8		3.2		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				9.8								
HCM 6th LOS				A								

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	51	34	16	34	79	20	281	7	53	277	53
Future Volume (vph)	58	51	34	16	34	79	20	281	7	53	277	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1585	0	0	1527	0	0	1685	0	0	1750	0
Flt Permitted		0.808			0.934			0.962			0.916	
Satd. Flow (perm)	0	1307	0	0	1435	0	0	1626	0	0	1614	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		21			82			3			18	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	0	0	134	0	0	321	0	0	399	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	27.0	27.0		27.0	27.0		48.0	48.0		48.0	48.0	
Total Split (%)	36.0%	36.0%		36.0%	36.0%		64.0%	64.0%		64.0%	64.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		10.3			10.2			20.8			20.8	
Actuated g/C Ratio		0.28			0.28			0.56			0.56	
v/c Ratio		0.39			0.29			0.35			0.44	
Control Delay		14.0			7.9			8.4			9.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.0			7.9			8.4			9.0	
LOS		B			A			A			A	
Approach Delay		14.0			7.9			8.4			9.0	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		18			7			38			48	
Queue Length 95th (ft)		67			42			100			126	
Internal Link Dist (ft)		930			1052			920			945	
Turn Bay Length (ft)												
Base Capacity (vph)		815			918			1580			1569	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.15			0.20			0.25	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 37

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 9.4

Intersection LOS: A

Intersection Capacity Utilization 60.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 29: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
48 s	27 s
 Ø6	 Ø8
48 s	27 s

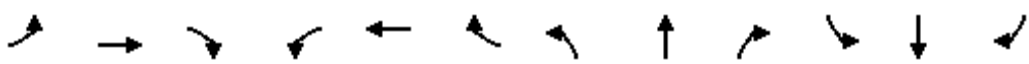
HCM 6th Signalized Intersection Summary
29: Colebrook Rd & Harrisburg Ave

2031 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	51	34	16	34	79	20	281	7	53	277	53
Future Volume (veh/h)	58	51	34	16	34	79	20	281	7	53	277	53
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	1724	1780	1837	1837	1795	1837	1724	1766	1794	1986	1958	1858
Adj Flow Rate, veh/h	60	53	35	17	35	82	21	293	7	55	289	55
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	8	4	0	0	3	0	5	2	0	0	2	9
Cap, veh/h	331	121	74	202	94	195	182	618	14	230	537	95
Arrive On Green	0.15	0.20	0.15	0.15	0.20	0.15	0.34	0.38	0.34	0.34	0.38	0.34
Sat Flow, veh/h	594	615	374	154	476	993	51	1629	37	149	1414	250
Grp Volume(v), veh/h	148	0	0	134	0	0	321	0	0	399	0	0
Grp Sat Flow(s),veh/h/ln	1583	0	0	1623	0	0	1718	0	0	1813	0	0
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
Cycle Q Clear(g_c), s	1.9	0.0	0.0	1.7	0.0	0.0	3.4	0.0	0.0	4.1	0.0	0.0
Prop In Lane	0.41		0.24	0.13		0.61	0.07		0.02	0.14		0.14
Lane Grp Cap(c), veh/h	458	0	0	422	0	0	742	0	0	785	0	0
V/C Ratio(X)	0.32	0.00	0.00	0.32	0.00	0.00	0.43	0.00	0.00	0.51	0.00	0.00
Avail Cap(c_a), veh/h	1523	0	0	1557	0	0	3156	0	0	3296	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.6	0.0	0.0	8.6	0.0	0.0	5.6	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.5	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(95%),veh/ln	0.8	0.0	0.0	0.8	0.0	0.0	1.3	0.0	0.0	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.0	0.0	0.0	9.1	0.0	0.0	6.0	0.0	0.0	6.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		148			134			321			399	
Approach Delay, s/veh		9.0			9.1			6.0			6.4	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		13.9		9.6		13.9		9.6				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		42.0		21.0		42.0		21.0				
Max Q Clear Time (g_c+I1), s		5.4		3.9		6.1		3.7				
Green Ext Time (p_c), s		1.4		0.4		1.8		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				7.0								
HCM 6th LOS				A								

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	35	2	856	7	63	659	7
Future Volume (vph)	36	0	17	17	1	35	2	856	7	63	659	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	150		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1631	0	1129	1562	0	1727	1612	1648
Flt Permitted		0.962			0.876		0.368			0.265		
Satd. Flow (perm)	0	1674	1581	0	1452	0	437	1562	0	482	1612	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		36			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	55	0	2	899	0	66	686	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.8	8.8		8.6		58.3	58.3		58.3	58.3	58.3
Actuated g/C Ratio		0.13	0.13		0.12		0.83	0.83		0.83	0.83	0.83
v/c Ratio		0.18	0.08		0.26		0.01	0.69		0.16	0.51	0.01
Control Delay		28.5	2.8		17.0		3.0	9.5		6.7	8.5	0.6
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		28.5	2.8		17.0		3.0	9.5		6.7	8.5	0.6
LOS		C	A		B		A	A		A	A	A
Approach Delay		20.2			17.0			9.5			8.3	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)		15	0		7		0	178		12	214	0
Queue Length 95th (ft)		39	5		36		2	#535		m18	m246	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				150			225		100
Base Capacity (vph)		298	320		288		364	1301		401	1342	1379
Starvation Cap Reductn		0	0		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		0.13	0.06		0.19		0.01	0.69		0.16	0.51	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 9.6

Intersection LOS: A

Intersection Capacity Utilization 73.2%

ICU Level of Service D

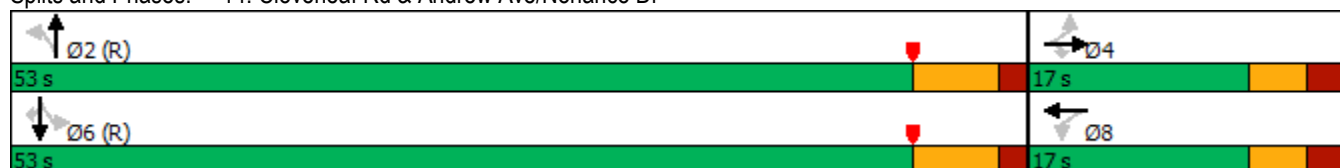
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



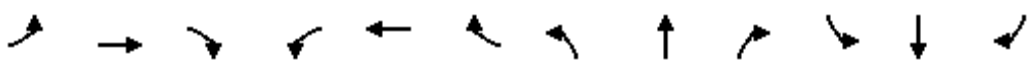
HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	35	2	856	7	63	659	7
Future Volume (veh/h)	36	0	17	17	1	35	2	856	7	63	659	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	36	2	892	7	66	686	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	227	0	124	94	10	69	442	1275	10	429	1373	1299
Arrive On Green	0.06	0.00	0.08	0.06	0.08	0.06	0.79	0.79	0.77	1.00	1.00	1.00
Sat Flow, veh/h	1585	0	1586	333	131	879	432	1622	13	621	1747	1652
Grp Volume(v), veh/h	38	0	18	55	0	0	2	0	899	66	686	7
Grp Sat Flow(s),veh/h/ln	1585	0	1586	1344	0	0	432	0	1635	621	1747	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.5	0.0	0.0	0.1	0.0	18.3	2.9	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.7	3.0	0.0	0.0	0.1	0.0	18.3	21.2	0.0	0.0
Prop In Lane	1.00		1.00	0.33		0.65	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	204	0	124	154	0	0	442	0	1285	429	1373	1299
V/C Ratio(X)	0.19	0.00	0.15	0.36	0.00	0.00	0.00	0.00	0.70	0.15	0.50	0.01
Avail Cap(c_a), veh/h	337	0	283	307	0	0	442	0	1285	429	1373	1299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.19	0.19	0.19
Uniform Delay (d), s/veh	30.9	0.0	30.1	31.6	0.0	0.0	1.6	0.0	3.6	3.5	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.4	0.0	0.0	0.0	0.0	3.2	0.1	0.2	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(95%),veh/ln	1.1	0.0	0.5	1.7	0.0	0.0	0.0	0.0	5.0	0.3	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	30.6	33.0	0.0	0.0	1.6	0.0	6.7	3.7	0.2	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56		55				901		759			
Approach Delay, s/veh	31.1		33.0				6.7		0.5			
Approach LOS	C		C				A		A			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	60.0		10.0		60.0		10.0					
Change Period (Y+Rc), s	6.0		5.5		6.0		5.5					
Max Green Setting (Gmax), s	47.0		11.5		47.0		11.5					
Max Q Clear Time (g_c+I1), s	20.3		3.5		23.2		5.0					
Green Ext Time (p_c), s	21.7		0.1		16.6		0.1					
Intersection Summary												
HCM 6th Ctrl Delay	5.7											
HCM 6th LOS	A											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	63	0	155	17	802	5	130	1064	35
Future Volume (vph)	15	0	18	63	0	155	17	802	5	130	1064	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	150		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1620	0	1693	1639	0	1727	1723	1648
Flt Permitted		0.460			0.897		0.104			0.251		
Satd. Flow (perm)	0	800	1581	0	1474	0	185	1639	0	456	1723	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		163			1				45
Link Speed (mph)		25			25			40				40
Link Distance (ft)		750			1000			600				1240
Travel Time (s)		20.5			27.3			10.2				21.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	229	0	18	849	0	137	1120	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		0.0	-1.0		0.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		6.0	5.0		6.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.7		40.8	41.8		40.8	41.8	41.8
Actuated g/C Ratio		0.14	0.14		0.14		0.68	0.70		0.68	0.70	0.70
v/c Ratio		0.14	0.07		0.65		0.14	0.74		0.44	0.93	0.03
Control Delay		24.1	1.7		17.4		6.5	11.1		2.0	9.1	0.1
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		24.1	1.7		17.4		6.5	11.1		2.0	9.1	0.1
LOS		C	A		B		A	B		A	A	A
Approach Delay		11.9			17.4			11.0			8.1	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)		5	0		21		3	188		4	30	0
Queue Length 95th (ft)		20	4		79		m7	m272		m4	m30	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				150			225		100
Base Capacity (vph)		140	322		392		125	1141		309	1199	1160
Starvation Cap Reductn		0	0		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		0.11	0.06		0.58		0.14	0.74		0.44	0.93	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 10.1

Intersection LOS: B

Intersection Capacity Utilization 102.5%

ICU Level of Service G

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	63	0	155	17	802	5	130	1064	35
Future Volume (veh/h)	15	0	18	63	0	155	17	802	5	130	1064	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	66	0	148	18	844	5	137	1120	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	299	0	278	145	17	188	420	1130	7	434	1231	1101
Arrive On Green	0.16	0.00	0.17	0.16	0.00	0.16	0.86	0.89	0.86	1.00	1.00	1.00
Sat Flow, veh/h	1021	0	1586	381	98	1075	462	1696	10	651	1846	1652
Grp Volume(v), veh/h	16	0	11	214	0	0	18	0	849	137	1120	36
Grp Sat Flow(s),veh/h/ln	1021	0	1586	1554	0	0	462	0	1706	651	1846	1652
Q Serve(g_s), s	0.0	0.0	0.3	6.2	0.0	0.0	0.3	0.0	10.0	4.8	0.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.3	8.0	0.0	0.0	0.3	0.0	10.0	14.8	0.0	0.0
Prop In Lane	1.00		1.00	0.31		0.69	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	282	0	278	325	0	0	420	0	1137	434	1231	1101
V/C Ratio(X)	0.06	0.00	0.04	0.66	0.00	0.00	0.04	0.00	0.75	0.32	0.91	0.03
Avail Cap(c_a), veh/h	282	0	278	325	0	0	420	0	1137	434	1231	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	21.2	0.0	20.6	24.2	0.0	0.0	1.4	0.0	1.7	1.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	4.8	0.0	0.0	0.2	0.0	4.5	0.2	1.3	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(95%),veh/ln	0.4	0.0	0.2	6.0	0.0	0.0	0.1	0.0	3.9	0.0	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	20.6	29.0	0.0	0.0	1.6	0.0	6.2	2.1	1.3	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	27			214			867			1293		
Approach Delay, s/veh	21.0			29.0			6.1			1.3		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			15.0			45.0			15.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	12.0			2.8			16.8			10.0		
Green Ext Time (p_c), s	21.1			0.0			21.1			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	5.7											
HCM 6th LOS	A											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	13	24	0	149	16	766	7	164	808	7
Future Volume (vph)	5	1	13	24	0	149	16	766	7	164	808	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	150		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1596	0	1693	1671	0	1727	1723	1648
Flt Permitted		0.708			0.950		0.256			0.276		
Satd. Flow (perm)	0	1232	1581	0	1527	0	456	1671	0	502	1723	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		157			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	14	0	182	0	17	813	0	173	851	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.4	8.4		8.4		42.1	42.1		42.1	42.1	42.1
Actuated g/C Ratio		0.14	0.14		0.14		0.70	0.70		0.70	0.70	0.70
v/c Ratio		0.03	0.05		0.52		0.05	0.69		0.49	0.71	0.01
Control Delay		21.2	0.4		11.9		4.0	9.9		5.7	6.5	0.0
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		21.2	0.4		11.9		4.0	9.9		5.7	6.5	0.0
LOS		C	A		B		A	A		A	A	A
Approach Delay		6.6			11.9			9.8			6.3	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)		2	0		8		1	122		2	12	0
Queue Length 95th (ft)		10	0		54		8	302		m13	m117	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				150			225		100
Base Capacity (vph)		236	347		419		319	1171		351	1207	1168
Starvation Cap Reductn		0	0		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		0.03	0.04		0.43		0.05	0.69		0.49	0.71	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 8.2

Intersection LOS: A

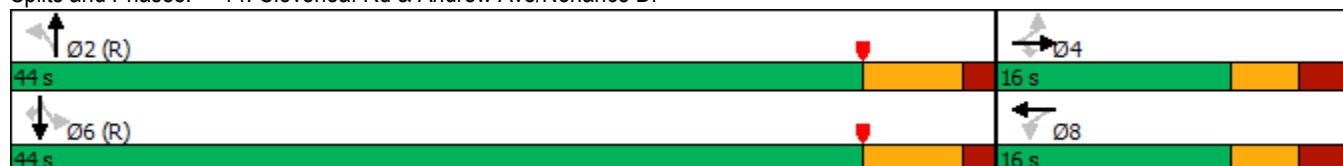
Intersection Capacity Utilization 84.8%

ICU Level of Service E

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2031 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	13	24	0	149	16	766	7	164	808	7
Future Volume (veh/h)	5	1	13	24	0	149	16	766	7	164	808	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	7	25	0	153	17	806	7	173	851	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	258	43	245	90	13	211	540	1180	10	396	1268	1135
Arrive On Green	0.14	0.15	0.15	0.14	0.00	0.14	0.69	0.69	0.67	1.00	1.00	1.00
Sat Flow, veh/h	956	278	1586	139	84	1361	612	1718	15	673	1846	1652
Grp Volume(v), veh/h	6	0	7	178	0	0	17	0	813	173	851	7
Grp Sat Flow(s),veh/h/ln	1234	0	1586	1584	0	0	612	0	1733	673	1846	1652
Q Serve(g_s), s	0.0	0.0	0.2	3.5	0.0	0.0	0.5	0.0	16.6	9.9	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	6.5	0.0	0.0	0.5	0.0	16.6	26.5	0.0	0.0
Prop In Lane	0.83		1.00	0.14		0.86	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	280	0	245	287	0	0	540	0	1191	396	1268	1135
V/C Ratio(X)	0.02	0.00	0.03	0.62	0.00	0.00	0.03	0.00	0.68	0.44	0.67	0.01
Avail Cap(c_a), veh/h	327	0	304	345	0	0	540	0	1191	396	1268	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	21.9	0.0	21.5	24.6	0.0	0.0	3.0	0.0	5.5	5.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.4	0.0	0.0	0.1	0.0	3.2	0.3	0.3	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(95%),veh/ln	0.1	0.0	0.2	4.7	0.0	0.0	0.1	0.0	7.1	0.9	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	21.6	27.1	0.0	0.0	3.1	0.0	8.7	5.7	0.3	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	13			178			830			1031		
Approach Delay, s/veh	21.7			27.1			8.6			1.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	46.2			13.8			46.2			13.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	18.6			2.2			28.5			8.5		
Green Ext Time (p_c), s	15.4			0.0			8.6			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	6.6											
HCM 6th LOS	A											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	20	105	8	13	77	42	868	8	11	632	154
Future Volume (vph)	349	20	105	8	13	77	42	868	8	11	632	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1570	0	1391	1565	0	1500	1616	0	1628	1613	1486
Flt Permitted	0.692			0.668			0.247			0.104		
Satd. Flow (perm)	1168	1570	0	977	1565	0	390	1616	0	178	1613	1486
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		117			86			1				171
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	388	139	0	9	100	0	47	973	0	12	702	171
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	26.0	26.0		26.0	26.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	37.1%	37.1%		37.1%	37.1%		62.9%	62.9%		62.9%	62.9%	62.9%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)	21.0	21.0		21.0	21.0		38.5	38.5		38.5	38.5	37.5
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.55	0.55		0.55	0.55	0.54
v/c Ratio	1.11	0.25		0.03	0.19		0.22	1.09		0.12	0.79	0.20
Control Delay	108.3	6.9		17.9	7.0		9.1	73.7		11.4	21.1	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	108.3	6.9		17.9	7.0		9.1	73.7		11.4	21.1	2.1
LOS	F	A		B	A		A	E		B	C	A
Approach Delay		81.6			7.9			70.7			17.3	
Approach LOS		F			A			E			B	
Queue Length 50th (ft)	~195	7		3	4		6	~489		2	220	0
Queue Length 95th (ft)	#351	43		12	35		m12	#700		12	#400	25

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	350	552		293	529		214	889		97	887	875
Starvation Cap Reductn	0	0		0	0		0	0		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	1.11	0.25		0.03	0.19		0.22	1.09		0.12	0.79	0.20

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 51.7

Intersection LOS: D

Intersection Capacity Utilization 84.6%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

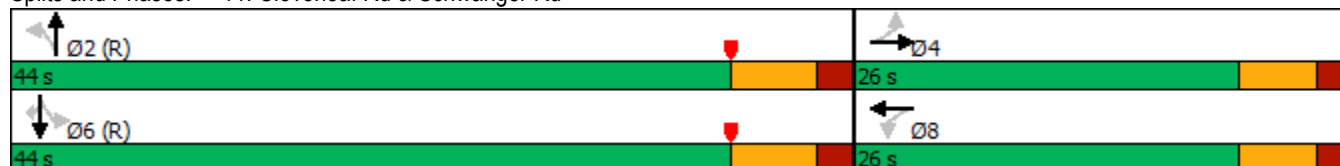
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	20	105	8	13	77	42	868	8	11	632	154
Future Volume (veh/h)	349	20	105	8	13	77	42	868	8	11	632	154
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	388	22	117	9	14	86	47	964	9	12	702	171
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	439	85	452	354	62	380	264	970	9	434	994	853
Arrive On Green	0.30	0.30	0.29	0.30	0.30	0.29	1.00	1.00	1.00	0.55	0.55	0.54
Sat Flow, veh/h	1354	284	1508	1046	206	1266	610	1764	16	602	1807	1591
Grp Volume(v), veh/h	388	0	139	9	0	100	47	0	973	12	702	171
Grp Sat Flow(s),veh/h/ln	1354	0	1791	1046	0	1472	610	0	1781	602	1807	1591
Q Serve(g_s), s	17.4	0.0	4.2	0.5	0.0	3.6	3.3	0.0	0.0	0.6	20.0	3.9
Cycle Q Clear(g_c), s	21.0	0.0	4.2	4.6	0.0	3.6	23.3	0.0	0.0	0.6	20.0	3.9
Prop In Lane	1.00		0.84	1.00		0.86	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	439	0	537	354	0	442	264	0	979	434	994	853
V/C Ratio(X)	0.88	0.00	0.26	0.03	0.00	0.23	0.18	0.00	0.99	0.03	0.71	0.20
Avail Cap(c_a), veh/h	439	0	537	354	0	442	264	0	979	434	994	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	0.0	18.9	20.4	0.0	18.7	6.0	0.0	0.0	7.2	11.6	8.5
Incr Delay (d2), s/veh	18.8	0.0	0.3	0.0	0.0	0.3	1.0	0.0	21.8	0.1	4.2	0.5
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(95%),veh/ln	13.4	0.0	3.0	0.2	0.0	2.1	0.5	0.0	9.2	0.1	11.8	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	0.0	19.2	20.4	0.0	19.0	7.0	0.0	21.8	7.4	15.8	9.0
LnGrp LOS	D	A	B	C	A	B	A	A	C	A	B	A
Approach Vol, veh/h	527			109			1020			885		
Approach Delay, s/veh	39.1			19.1			21.2			14.4		
Approach LOS	D			B			C			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.0			26.0			44.0			26.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	37.5			20.0			37.5			20.0		
Max Q Clear Time (g_c+I1), s	2.0			23.0			22.0			6.6		
Green Ext Time (p_c), s	30.0			0.0			12.3			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	22.4											
HCM 6th LOS	C											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	35	113	9	42	37	96	861	14	51	1107	331
Future Volume (vph)	226	35	113	9	42	37	96	861	14	51	1107	331
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1664	0	1416	1704	0	1620	1696	0	1628	1740	1545
Flt Permitted	0.703			0.658			0.104			0.181		
Satd. Flow (perm)	1199	1664	0	981	1704	0	177	1696	0	310	1740	1545
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		98			39			3				348
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	238	156	0	9	83	0	101	921	0	54	1165	348
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	16.0	16.0		16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%		26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)	11.0	11.0		11.0	11.0		38.5	38.5		38.5	38.5	37.5
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.64	0.64		0.64	0.64	0.62
v/c Ratio	1.09	0.41		0.05	0.24		0.89	0.85		0.27	1.04	0.32
Control Delay	115.5	13.1		21.1	15.1		67.5	19.7		9.0	53.8	1.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	115.5	13.1		21.1	15.1		67.5	19.7		9.0	53.8	1.5
LOS	F	B		C	B		E	B		A	D	A
Approach Delay		75.0			15.7			24.4			40.6	
Approach LOS		E			B			C			D	
Queue Length 50th (ft)	~100	18		3	13		47	401		7	~472	0
Queue Length 95th (ft)	#220	63		13	46		m#111	399		25	#686	23
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	219	385		179	344		113	1089		198	1116	1096
Starvation Cap Reductn	0	0		0	0		0	0		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	1.09	0.41		0.05	0.24		0.89	0.85		0.27	1.04	0.32

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 38.9

Intersection LOS: D

Intersection Capacity Utilization 104.7%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	35	113	9	42	37	96	861	14	51	1107	331
Future Volume (veh/h)	226	35	113	9	42	37	96	861	14	51	1107	331
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	238	37	95	9	44	25	101	906	14	54	1165	337
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	329	94	241	248	200	113	152	1169	18	257	1232	1025
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.43	0.43	0.42	0.64	0.64	0.63
Sat Flow, veh/h	1404	513	1316	1073	1089	619	357	1822	28	633	1921	1640
Grp Volume(v), veh/h	238	0	132	9	0	69	101	0	920	54	1165	337
Grp Sat Flow(s),veh/h/ln	1404	0	1829	1073	0	1708	357	0	1850	633	1921	1640
Q Serve(g_s), s	8.9	0.0	3.8	0.4	0.0	2.1	5.4	0.0	25.5	4.4	33.1	5.8
Cycle Q Clear(g_c), s	11.0	0.0	3.8	4.3	0.0	2.1	38.5	0.0	25.5	29.9	33.1	5.8
Prop In Lane	1.00		0.72	1.00		0.36	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	329	0	335	248	0	313	152	0	1187	257	1232	1025
V/C Ratio(X)	0.72	0.00	0.39	0.04	0.00	0.22	0.67	0.00	0.78	0.21	0.95	0.33
Avail Cap(c_a), veh/h	329	0	335	248	0	313	152	0	1187	257	1232	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.59	0.00	0.59	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	21.9	23.5	0.0	21.0	35.5	0.0	13.4	20.1	9.8	5.3
Incr Delay (d2), s/veh	7.7	0.0	0.8	0.1	0.0	0.4	12.8	0.0	3.0	1.9	15.5	0.9
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(95%),veh/ln	7.0	0.0	2.9	0.2	0.0	1.4	3.6	0.0	15.2	1.3	19.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	0.0	22.6	23.5	0.0	21.4	48.3	0.0	16.4	22.0	25.3	6.2
LnGrp LOS	C	A	C	C	A	C	D	A	B	C	C	A
Approach Vol, veh/h	370			78			1021			1556		
Approach Delay, s/veh	29.8			21.6			19.6			21.0		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.0			16.0			44.0			16.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	37.5			10.0			37.5			10.0		
Max Q Clear Time (g_c+I1), s	27.5			13.0			35.1			6.3		
Green Ext Time (p_c), s	9.0			0.0			2.3			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	21.6											
HCM 6th LOS	C											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	24	105	12	22	34	77	833	8	20	838	187
Future Volume (vph)	157	24	105	12	22	34	77	833	8	20	838	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1647	0	1572	1634	0	1620	1713	0	1550	1757	1561
Flt Permitted	0.719			0.670			0.180			0.178		
Satd. Flow (perm)	1226	1647	0	1109	1634	0	307	1713	0	290	1757	1561
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		111			36			1				197
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	165	136	0	13	59	0	81	885	0	21	882	197
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)	12.9	12.9		12.9	12.9		36.6	36.6		36.6	36.6	35.6
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.61	0.61		0.61	0.61	0.59
v/c Ratio	0.63	0.31		0.05	0.16		0.43	0.85		0.12	0.82	0.20
Control Delay	32.1	8.2		18.0	10.9		13.4	18.8		7.8	19.1	1.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	32.1	8.2		18.0	10.9		13.4	18.8		7.8	19.1	1.7
LOS	C	A		B	B		B	B		A	B	A
Approach Delay		21.3			12.2			18.3			15.8	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)	53	7		4	6		17	291		3	230	0
Queue Length 95th (ft)	106	43		15	30		m24	#531		13	#490	22
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	306	495		277	435		187	1046		177	1072	1007
Starvation Cap Reductn	0	0		0	0		0	0		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	0.54	0.27		0.05	0.14		0.43	0.85		0.12	0.82	0.20

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 17.4

Intersection LOS: B

Intersection Capacity Utilization 86.0%

ICU Level of Service E

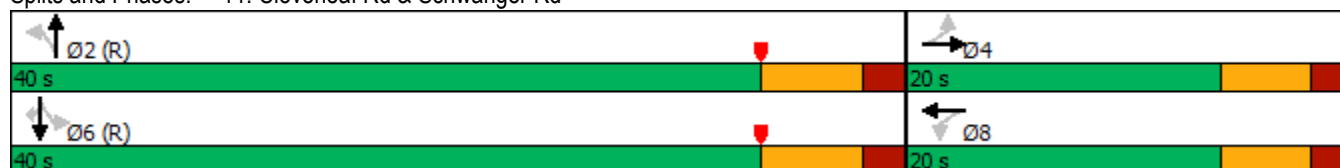
Analysis Period (min) 15

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary 11: Cloverleaf Rd & Schwanger Rd

2031 Build w/ Improvements
SAT Peak Hour

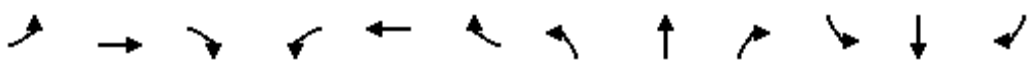
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	24	105	12	22	34	77	833	8	20	838	187
Future Volume (veh/h)	157	24	105	12	22	34	77	833	8	20	838	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	165	25	84	13	23	22	81	877	7	21	882	163
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	355	78	261	281	159	153	305	1182	9	272	1235	1027
Arrive On Green	0.19	0.19	0.17	0.19	0.19	0.17	0.43	0.43	0.42	0.64	0.64	0.62
Sat Flow, veh/h	1435	416	1398	1202	855	818	552	1852	15	631	1935	1652
Grp Volume(v), veh/h	165	0	109	13	0	45	81	0	884	21	882	163
Grp Sat Flow(s),veh/h/ln	1435	0	1814	1202	0	1673	552	0	1866	631	1935	1652
Q Serve(g_s), s	6.5	0.0	3.2	0.6	0.0	1.4	7.6	0.0	23.8	1.6	18.2	2.5
Cycle Q Clear(g_c), s	7.9	0.0	3.2	3.7	0.0	1.4	25.7	0.0	23.8	25.4	18.2	2.5
Prop In Lane	1.00		0.77	1.00		0.49	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	355	0	338	281	0	312	305	0	1192	272	1235	1027
V/C Ratio(X)	0.46	0.00	0.32	0.05	0.00	0.14	0.27	0.00	0.74	0.08	0.71	0.16
Avail Cap(c_a), veh/h	446	0	454	357	0	418	305	0	1192	272	1235	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	21.5	22.7	0.0	20.6	21.4	0.0	13.0	17.9	7.2	4.8
Incr Delay (d2), s/veh	0.9	0.0	0.5	0.1	0.0	0.2	1.4	0.0	2.8	0.6	3.5	0.3
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(95%),veh/ln	3.8	0.0	2.3	0.3	0.0	0.9	1.9	0.0	14.7	0.4	9.4	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	0.0	22.0	22.8	0.0	20.8	22.8	0.0	15.8	18.4	10.7	5.1
LnGrp LOS	C	A	C	C	A	C	C	A	B	B	B	A
Approach Vol, veh/h	274			58			965			1066		
Approach Delay, s/veh	23.6			21.3			16.4			10.0		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.8			16.2			43.8			16.2		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	25.8			9.9			20.2			5.7		
Green Ext Time (p_c), s	6.9			0.4			12.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	14.5											
HCM 6th LOS	B											

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	718	0	127	383	190	0	0	273	49
Future Volume (vph)	0	0	0	718	0	127	383	190	0	0	273	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.246					
Satd. Flow (perm)	0	0	0	0	1653	1414	411	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						140						132
Link Speed (mph)		25			25			40				40
Link Distance (ft)		1000			1000			550				996
Travel Time (s)		27.3			27.3			9.4				17.0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	756	134	403	200	0	0	287	52
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	7.0			7.0	7.0
Minimum Split (s)				12.5	12.5	12.5	13.0	13.0			13.0	13.0
Total Split (s)				34.5	34.5	34.5	17.0	35.5			18.5	18.5
Total Split (%)				49.3%	49.3%	49.3%	24.3%	50.7%			26.4%	26.4%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					30.0	30.0	30.5	30.5			13.5	13.5
Actuated g/C Ratio					0.43	0.43	0.44	0.44			0.19	0.19
v/c Ratio					1.07	0.20	1.06	0.30			0.90	0.12
Control Delay					76.4	3.2	82.8	14.5			61.2	0.6
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					76.4	3.2	82.8	14.5			61.2	0.6
LOS					E	A	F	B			E	A
Approach Delay					65.4			60.1			51.9	
Approach LOS					E			E			D	
Queue Length 50th (ft)					~369	0	~142	54			122	0
Queue Length 95th (ft)					#567	27	#306	98			#255	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2031 Build w/ Improvements

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					708	686	381	658			319	422
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					1.07	0.20	1.06	0.30			0.90	0.12

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 61.2

Intersection LOS: E

Intersection Capacity Utilization 157.8%

ICU Level of Service H

Analysis Period (min) 15

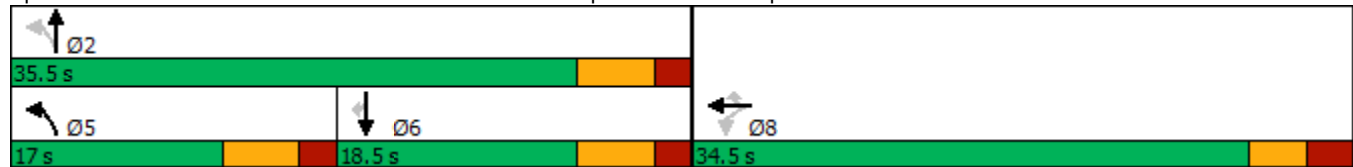
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2031 Build w/ Improvements

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	718	0	127	383	190	0	0	273	49
Future Volume (veh/h)	0	0	0	718	0	127	383	190	0	0	273	49
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				756	0	0	403	200	0	0	287	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				765	0		425	689	0	0	345	
Arrive On Green				0.41	0.00	0.00	0.17	0.44	0.00	0.00	0.19	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				756	0	0	403	200	0	0	287	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				29.4	0.0	0.0	12.0	5.7	0.0	0.0	10.8	0.0
Cycle Q Clear(g_c), s				29.4	0.0	0.0	12.0	5.7	0.0	0.0	10.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				765	0		425	689	0	0	345	
V/C Ratio(X)				0.99	0.00		0.95	0.29	0.00	0.00	0.83	
Avail Cap(c_a), veh/h				765	0		425	689	0	0	345	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				20.3	0.0	0.0	19.8	12.8	0.0	0.0	27.2	0.0
Incr Delay (d2), s/veh				29.5	0.0	0.0	30.5	0.8	0.0	0.0	19.1	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
%ile BackOfQ(95%),veh/ln				24.4	0.0	0.0	12.8	3.4	0.0	0.0	10.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				49.8	0.0	0.0	50.3	13.6	0.0	0.0	46.3	0.0
LnGrp LOS				D	A		D	B	A	A	D	
Approach Vol, veh/h					756			603			287	
Approach Delay, s/veh					49.8			38.1			46.3	
Approach LOS					D			D			D	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	35.5			17.0			18.5			34.5		
Change Period (Y+Rc), s	6.0			6.0			6.0			5.5		
Max Green Setting (Gmax), s	29.5			11.0			12.5			29.0		
Max Q Clear Time (g_c+I1), s	7.7			14.0			12.8			31.4		
Green Ext Time (p_c), s	3.9			0.0			0.0			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	44.9											
HCM 6th LOS	D											

APPENDIX L14

2028 NO BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 No Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	422	80	96	407	145	146
Future Volume (vph)	422	80	96	407	145	146
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1681	0	1662	1766	1534	0
Flt Permitted			0.237		0.976	
Satd. Flow (perm)	1681	0	415	1766	1534	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	17					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	558	0	107	452	323	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	31.6		42.3	41.1	18.5	
Actuated g/C Ratio	0.45		0.60	0.59	0.26	
v/c Ratio	0.73		0.28	0.44	0.80	
Control Delay	23.9		5.9	7.0	41.2	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	23.9		5.9	7.0	41.2	
LOS	C		A	A	D	
Approach Delay	23.9			6.8	41.2	
Approach LOS	C			A	D	
Queue Length 50th (ft)	197		14	65	128	
Queue Length 95th (ft)	#366		25	91	#253	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	767		393	1038	411	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.73		0.27	0.44	0.79	

Intersection Summary

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 21.1	Intersection LOS: C
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: Maytown Rd & SR 0230

↙ Ø1	→ Ø2 (R)	↖ Ø4
12 s	34 s	24 s
↖ Ø6 (R)		
46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2028 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	422	80	96	407	145	146
Future Volume (veh/h)	422	80	96	407	145	146
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	469	83	107	452	161	162
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	648	115	422	1174	196	197
Arrive On Green	0.48	0.46	0.15	1.00	0.24	0.23
Sat Flow, veh/h	1363	241	1846	1927	808	813
Grp Volume(v), veh/h	0	552	107	452	324	0
Grp Sat Flow(s),veh/h/ln	0	1604	1846	1927	1627	0
Q Serve(g_s), s	0.0	19.3	1.8	0.0	13.2	0.0
Cycle Q Clear(g_c), s	0.0	19.3	1.8	0.0	13.2	0.0
Prop In Lane		0.15	1.00		0.50	0.50
Lane Grp Cap(c), veh/h	0	763	422	1174	394	0
V/C Ratio(X)	0.00	0.72	0.25	0.38	0.82	0.00
Avail Cap(c_a), veh/h	0	763	491	1174	437	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	14.7	9.3	0.0	25.4	0.0
Incr Delay (d2), s/veh	0.0	5.9	0.3	1.0	15.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	11.7	1.0	0.6	10.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	20.6	9.6	1.0	41.2	0.0
LnGrp LOS	A	C	A	A	D	A
Approach Vol, veh/h	552			559	324	
Approach Delay, s/veh	20.6			2.6	41.2	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.4	38.5		22.1		47.9
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.8	21.3		15.2		2.0
Green Ext Time (p_c), s	0.1	4.2		0.7		12.0
Intersection Summary						
HCM 6th Ctrl Delay			18.3			
HCM 6th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	579	1	0	545	47	0	0	2	57	0	88
Future Volume (vph)	44	579	1	0	545	47	0	0	2	57	0	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1614	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1614	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	652	0	0	665	0	0	2	0	64	99	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 53.2%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	579	1	0	545	47	0	0	2	57	0	88
Future Vol, veh/h	44	579	1	0	545	47	0	0	2	57	0	88
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	49	651	1	0	612	53	0	0	2	64	0	99

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	665	0	0	652	0	0	1439	1415	653	1391	1389	640
Stage 1	-	-	-	-	-	-	750	750	-	639	639	-
Stage 2	-	-	-	-	-	-	689	665	-	752	750	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	742	-	-	574	-	-	142	162	419	164	181	471
Stage 1	-	-	-	-	-	-	492	458	-	583	527	-
Stage 2	-	-	-	-	-	-	530	496	-	512	478	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	742	-	-	574	-	-	107	151	419	155	169	471
Mov Cap-2 Maneuver	-	-	-	-	-	-	107	151	-	155	169	-
Stage 1	-	-	-	-	-	-	460	428	-	545	527	-
Stage 2	-	-	-	-	-	-	418	496	-	475	446	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	13.6	26.1
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	419	742	-	-	574	-	-	155	471
HCM Lane V/C Ratio	0.005	0.067	-	-	-	-	-	0.413	0.21
HCM Control Delay (s)	13.6	10.2	-	-	0	-	-	43.7	14.7
HCM Lane LOS	B	B	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	1.8	0.8

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	505	45	63	481	6	104	2	73	4	3	2
Future Volume (vph)	3	505	45	63	481	6	104	2	73	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.465			0.319			0.754			0.703		
Satd. Flow (perm)	809	1667	1552	518	1558	1608	1302	1516	0	1303	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45		81			2	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	561	50	70	534	7	116	83	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	42.2	42.2	42.2	52.2	52.1	52.1	10.8	10.8		10.7	10.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.56	0.05	0.14	0.46	0.01	0.58	0.27		0.02	0.02	
Control Delay	6.7	9.1	0.1	1.6	3.2	0.0	39.1	9.7		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	9.1	0.1	1.6	3.2	0.0	39.1	9.7		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		8.3			3.0			26.8			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	0	87	0	8	66	0	46	1		1	1	
Queue Length 95th (ft)	m1	m122	m0	1	11	m0	95	35		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	488	1005	988	510	1159	1208	225	329		225	320	
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	0.01	0.56	0.05	0.14	0.46	0.01	0.52	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 65.7%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	505	45	63	481	6	104	2	73	4	3	2
Future Volume (veh/h)	3	505	45	63	481	6	104	2	73	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	561	34	70	534	6	116	2	43	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	683	1184	1047	647	1165	1116	283	9	199	259	145	97
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	954	1947	1722	1640	1609	1542	1461	75	1612	1467	1176	784
Grp Volume(v), veh/h	3	561	34	70	534	6	116	0	45	4	0	5
Grp Sat Flow(s),veh/h/ln	954	1947	1722	1640	1609	1542	1461	0	1687	1467	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	5.3	0.0	1.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.9	0.0	0.0	5.3	0.0	1.7	1.4	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	683	1184	1047	647	1165	1116	283	0	208	259	0	242
V/C Ratio(X)	0.00	0.47	0.03	0.11	0.46	0.01	0.41	0.00	0.22	0.02	0.00	0.02
Avail Cap(c_a), veh/h	683	1184	1047	762	1165	1116	355	0	292	331	0	339
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)	1.00	1.00	1.00	0.92	0.92	0.92	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.3	0.0	0.0	29.2	0.0	28.1	28.0	0.0	27.1
Incr Delay (d2), s/veh	0.0	1.4	0.1	0.1	1.2	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.8	0.0	0.3	0.7	0.0	3.4	0.0	1.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.4	0.1	3.3	1.2	0.0	30.2	0.0	28.6	28.1	0.0	27.2
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	598			610			161			9		
Approach Delay, s/veh	1.3			1.4			29.7			27.6		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.1	48.4	13.5		56.5		13.5					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.4	2.5	3.9		2.5		7.8					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.8
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	430	13	5	517	12	9	0	15	6	0	8
Future Volume (vph)	26	430	13	5	517	12	9	0	15	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1660	0	1744	1654	1445	0	1727	0	1719	1501	0
Flt Permitted	0.382			0.491				0.870				
Satd. Flow (perm)	674	1660	0	901	1654	1415	0	1530	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				126		139			401	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	476	0	5	556	13	0	26	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.32		0.01	0.40	0.01		0.09		0.03	0.02	
Control Delay	0.9	2.4		3.8	5.0	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.9	2.4		3.8	5.0	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.3			4.9			0.7			11.5	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	68		m2	120	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	676	1493		753	1383	1204		325		242	548	
Starvation Cap Reductn	0	0		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	0.04	0.32		0.01	0.40	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 3.7

Intersection LOS: A

Intersection Capacity Utilization 45.2%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2028 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	430	13	5	517	12	9	0	15	6	0	8
Future Volume (veh/h)	26	430	13	5	517	12	9	0	15	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	28	462	14	5	556	13	10	0	15	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	712	1286	39	794	1295	1123	88	0	24	161	70	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1570	48	956	1793	1554	418	0	626	1360	1837	0
Grp Volume(v), veh/h	28	0	476	5	556	13	25	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1618	956	1793	1554	1044	0	0	1360	1837	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.40		0.60	1.00		0.00
Lane Grp Cap(c), veh/h	712	0	1325	794	1295	1123	97	0	0	161	70	0
V/C Ratio(X)	0.04	0.00	0.36	0.01	0.43	0.01	0.26	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	811	0	1325	794	1295	1123	241	0	0	292	247	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(l)	0.81	0.00	0.81	0.91	0.91	0.91	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	33.9	0.0	0.0	32.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.0	0.9	0.0	1.4	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.4	0.0	0.6	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.6	0.0	0.9	0.0	35.3	0.0	0.0	32.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	504			574			25			6		
Approach Delay, s/veh	0.7			0.9			35.3			32.6		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.8	56.0	7.3		62.7		7.3					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.8	2.5	2.7		2.5		3.7					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	1.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	395	5	10	414	35	61	31	36	59	26	51
Future Volume (vph)	39	395	5	10	414	35	61	31	36	59	26	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1668	0	1246	1585	0	1248	1509	0	0	1835	0
Flt Permitted	0.462			0.496			0.647				0.827	
Satd. Flow (perm)	819	1668	0	651	1585	0	850	1509	0	0	1549	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			10			39			44	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	430	0	11	483	0	66	72	0	0	146	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	51.7	51.7		51.7	51.7		11.7	11.7			11.7	
Actuated g/C Ratio	0.74	0.74		0.74	0.74		0.17	0.17			0.17	
v/c Ratio	0.07	0.35		0.02	0.41		0.47	0.25			0.50	
Control Delay	1.1	1.5		4.9	6.5		35.9	15.2			23.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.5		4.9	6.5		35.9	15.2			23.4	
LOS	A	A		A	A		D	B			C	
Approach Delay		1.4			6.5			25.1			23.4	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	1	8		1	72		26	12			40	
Queue Length 95th (ft)	3	17		7	166		57	41			82	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	605	1232		480	1173		242	459			474	
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	0.07	0.35		0.02	0.41		0.27	0.16			0.31	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 8.6

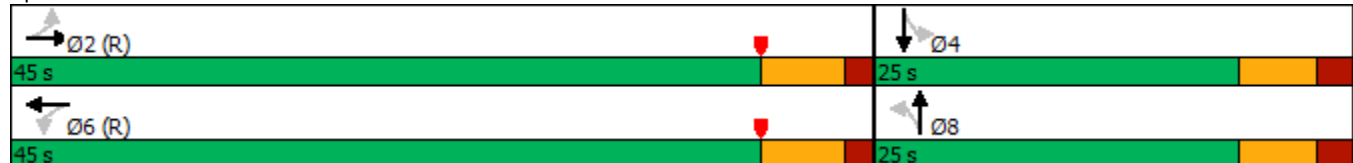
Intersection LOS: A

Intersection Capacity Utilization 57.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2028 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	395	5	10	414	35	61	31	36	59	26	51
Future Volume (veh/h)	39	395	5	10	414	35	61	31	36	59	26	51
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	42	425	4	11	445	37	66	33	17	63	28	37
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	639	1208	11	656	1209	101	234	138	71	157	59	57
Arrive On Green	1.00	1.00	1.00	0.73	0.73	0.71	0.13	0.13	0.12	0.12	0.13	0.12
Sat Flow, veh/h	854	1661	16	761	1663	138	987	1052	542	609	452	431
Grp Volume(v), veh/h	42	0	429	11	0	482	66	0	50	128	0	0
Grp Sat Flow(s),veh/h/ln	854	0	1677	761	0	1802	987	0	1593	1492	0	0
Q Serve(g_s), s	0.5	0.0	0.0	0.3	0.0	7.0	0.0	0.0	2.0	4.0	0.0	0.0
Cycle Q Clear(g_c), s	7.5	0.0	0.0	0.3	0.0	7.0	4.3	0.0	2.0	6.0	0.0	0.0
Prop In Lane	1.00		0.01	1.00		0.08	1.00		0.34	0.49		0.29
Lane Grp Cap(c), veh/h	639	0	1219	656	0	1310	234	0	209	251	0	0
V/C Ratio(X)	0.07	0.00	0.35	0.02	0.00	0.37	0.28	0.00	0.24	0.51	0.00	0.00
Avail Cap(c_a), veh/h	639	0	1219	656	0	1310	386	0	455	503	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(l)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.5	0.0	0.0	2.6	0.0	3.6	28.3	0.0	27.4	29.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.8	0.0	0.0	0.8	0.7	0.0	0.6	1.6	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	2.8	1.8	0.0	1.4	3.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.7	0.0	0.8	2.7	0.0	4.4	28.9	0.0	28.0	31.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	471		493			116			128			
Approach Delay, s/veh	0.8		4.3			28.5			31.1			
Approach LOS	A		A			C			C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	55.8		14.2		55.8		14.2					
Change Period (Y+Rc), s	* 5.9		6.0		* 5.9		6.0					
Max Green Setting (Gmax), s	* 39		19.0		* 39		19.0					
Max Q Clear Time (g_c+I1), s	2.0		8.0		9.0		6.3					
Green Ext Time (p_c), s	12.4		0.3		13.4		0.3					
Intersection Summary												
HCM 6th Ctrl Delay			8.1									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	346	0	89	565	154	0	0	196	57
Future Volume (vph)	0	0	0	346	0	89	565	154	0	0	196	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.465					
Satd. Flow (perm)	0	0	0	0	1546	1145	756	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	360	93	589	160	0	0	204	59
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.0	16.0	32.7	32.7			15.6	15.6
Actuated g/C Ratio					0.27	0.27	0.56	0.56			0.27	0.27
v/c Ratio					0.85	0.21	1.00	0.20			0.50	0.11
Control Delay					41.9	2.0	53.1	7.2			22.9	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					41.9	2.0	53.1	7.2			22.9	0.4
LOS					D	A	D	A			C	A
Approach Delay					33.7			43.3			17.8	
Approach LOS					C			D			B	
Queue Length 50th (ft)					122	0	~134	25			61	0
Queue Length 95th (ft)					#256	8	#401	50			116	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					439	442	587	833			447	555
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					0.82	0.21	1.00	0.19			0.46	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.2

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 35.8

Intersection LOS: D

Intersection Capacity Utilization 93.1%

ICU Level of Service F

Analysis Period (min) 15

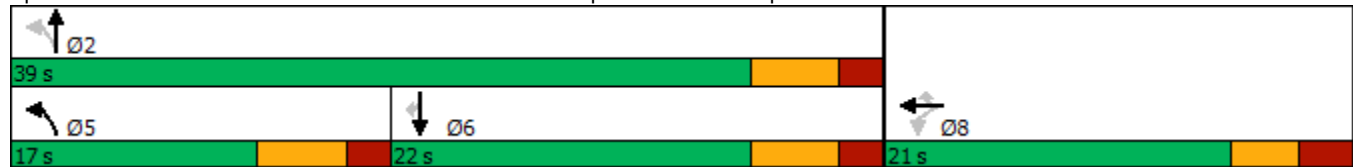
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	346	0	89	565	154	0	0	196	57
Future Volume (veh/h)	0	0	0	346	0	89	565	154	0	0	196	57
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				360	0	0	589	160	0	0	204	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				457	0		649	838	0	0	407	
Arrive On Green				0.24	0.00	0.00	0.23	0.57	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				360	0	0	589	160	0	0	204	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				10.0	0.0	0.0	12.0	2.8	0.0	0.0	5.6	0.0
Cycle Q Clear(g_c), s				10.0	0.0	0.0	12.0	2.8	0.0	0.0	5.6	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				457	0		649	838	0	0	407	
V/C Ratio(X)				0.79	0.00		0.91	0.19	0.00	0.00	0.50	
Avail Cap(c_a), veh/h				555	0		649	950	0	0	532	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.9	0.0	0.0	12.6	5.6	0.0	0.0	17.3	0.0
Incr Delay (d2), s/veh				6.2	0.0	0.0	16.7	0.4	0.0	0.0	3.4	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
%ile BackOfQ(50%),veh/ln				4.6	0.0	0.0	6.6	0.6	0.0	0.0	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.1	0.0	0.0	29.3	6.0	0.0	0.0	20.7	0.0
LnGrp LOS				C	A		C	A	A	A	C	
Approach Vol, veh/h					360			749			204	
Approach Delay, s/veh					25.1			24.4			20.7	
Approach LOS					C			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		18.1				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		4.8			14.0	7.6		12.0				
Green Ext Time (p_c), s		3.5			0.0	2.0		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				24.0								
HCM 6th LOS				C								

Notes

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

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2	256	0	0	0	0	686	616	109	426	0
Future Volume (vph)	32	2	256	0	0	0	0	686	616	109	426	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	272	0	0	0	0	1385	0	116	453	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 93.1% ICU Level of Service F

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2028 No Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	32	2	256	0	0	0	0	686	616	109	426	0
Future Vol, veh/h	32	2	256	0	0	0	0	686	616	109	426	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	34	2	272	0	0	0	0	730	655	116	453	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1415	1415	453	-	0	0	730	0	0
Stage 1	685	685	-	-	-	-	-	-	-
Stage 2	730	730	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	144	176	643	0	-	-	695	-	0
Stage 1	598	506	-	0	-	-	-	-	0
Stage 2	572	486	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	120	0	643	-	-	-	695	-	-
Mov Cap-2 Maneuver	120	0	-	-	-	-	-	-	-
Stage 1	598	0	-	-	-	-	-	-	-
Stage 2	476	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.5	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	120	643	695	-
HCM Lane V/C Ratio	-	-	0.301	0.424	0.167	-
HCM Control Delay (s)	-	-	47.5	14.6	11.2	-
HCM Lane LOS	-	-	E	B	B	-
HCM 95th %tile Q(veh)	-	-	1.2	2.1	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 No Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	25	0	1285	673	5
Future Volume (vph)	6	25	0	1285	673	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1622	0	0	1734	1653	0
Flt Permitted	0.990					
Satd. Flow (perm)	1622	0	0	1734	1653	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	1428	754	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	77.6%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 No Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	0	1285	673	5
Future Vol, veh/h	6	25	0	1285	673	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	28	0	1428	748	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2179	751	754	0	-	0
Stage 1	751	-	-	-	-	-
Stage 2	1428	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	54	433	714	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	54	433	714	-	-	-
Mov Cap-2 Maneuver	54	-	-	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	29	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	714	-	184	-	-	
HCM Lane V/C Ratio	-	-	0.187	-	-	
HCM Control Delay (s)	0	-	29	-	-	
HCM Lane LOS	A	-	D	-	-	
HCM 95th %tile Q(veh)	0	-	0.7	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	430	20	112	8	12	76	41	779	8	10	510	191
Future Volume (vph)	430	20	112	8	12	76	41	779	8	10	510	191
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1567	0	1391	1564	0	1500	1615	0	1628	1567	0
Flt Permitted	0.694			0.664			0.204			0.138		
Satd. Flow (perm)	1172	1567	0	971	1564	0	322	1615	0	236	1567	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		124			84			1			44	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	478	146	0	9	97	0	46	875	0	11	779	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.43	0.27		0.03	0.19		0.25	0.96		0.08	0.86	
Control Delay	235.8	7.1		18.6	7.3		9.7	33.7		8.9	24.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	235.8	7.1		18.6	7.3		9.7	33.7		8.9	24.7	
LOS	F	A		B	A		A	C		A	C	
Approach Delay		182.3			8.3			32.5			24.5	
Approach LOS		F			A			C			C	
Queue Length 50th (ft)	~285	7		3	4		6	335		2	245	
Queue Length 95th (ft)	#454	46		13	35		m12	#590		9	#494	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	334	536		277	506		181	911		133	903	
Starvation Cap Reductn	0	0		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	1.43	0.27		0.03	0.19		0.25	0.96		0.08	0.86	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.43

Intersection Signal Delay: 67.1

Intersection LOS: E

Intersection Capacity Utilization 84.4%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

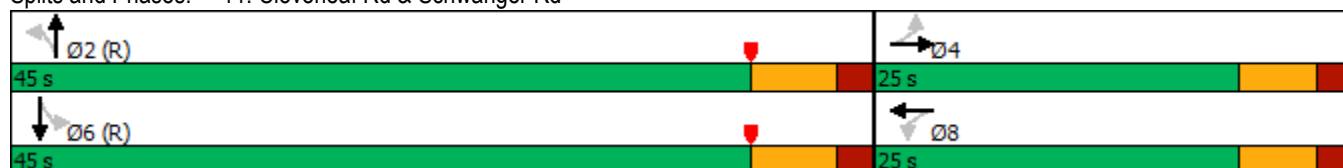
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2028 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	20	112	8	12	76	41	779	8	10	510	191
Future Volume (veh/h)	430	20	112	8	12	76	41	779	8	10	510	191
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	478	22	124	9	13	84	46	866	9	11	567	212
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	421	77	434	333	56	364	238	994	10	475	707	265
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1357	270	1519	1039	197	1274	666	1762	18	660	1254	469
Grp Volume(v), veh/h	478	0	146	9	0	97	46	0	875	11	0	779
Grp Sat Flow(s),veh/h/ln	1357	0	1789	1039	0	1471	666	0	1781	660	0	1722
Q Serve(g_s), s	16.4	0.0	4.5	0.5	0.0	3.6	3.5	0.0	0.0	0.5	0.0	25.3
Cycle Q Clear(g_c), s	20.0	0.0	4.5	5.0	0.0	3.6	28.8	0.0	0.0	0.5	0.0	25.3
Prop In Lane	1.00		0.85	1.00		0.87	1.00		0.01	1.00		0.27
Lane Grp Cap(c), veh/h	421	0	511	333	0	420	238	0	1005	475	0	972
V/C Ratio(X)	1.13	0.00	0.29	0.03	0.00	0.23	0.19	0.00	0.87	0.02	0.00	0.80
Avail Cap(c_a), veh/h	421	0	511	333	0	420	238	0	1005	475	0	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.72	0.00	0.72	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	19.8	21.4	0.0	19.5	9.2	0.0	0.0	6.8	0.0	12.3
Incr Delay (d2), s/veh	86.0	0.0	0.3	0.0	0.0	0.3	1.3	0.0	7.7	0.1	0.0	6.9
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	16.9	0.0	1.8	0.1	0.0	1.2	0.4	0.0	2.1	0.1	0.0	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	114.8	0.0	20.1	21.4	0.0	19.7	10.5	0.0	7.7	6.8	0.0	19.2
LnGrp LOS	F	A	C	C	A	B	B	A	A	A	A	B
Approach Vol, veh/h	624			106			921			790		
Approach Delay, s/veh	92.6			19.9			7.8			19.0		
Approach LOS	F			B			A			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			27.3			7.0		
Green Ext Time (p_c), s	28.2			0.0			9.4			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	33.7											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	9	2	791	7	25	582	7
Future Volume (vph)	36	0	17	17	1	9	2	791	7	25	582	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1686	0	0	1561	0	0	1615	1648
Flt Permitted		0.739			0.783			0.999			0.956	
Satd. Flow (perm)	0	1286	1581	0	1362	0	0	1559	0	0	1547	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		9			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	28	0	0	833	0	0	632	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		8.7	8.7		8.6			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.24	0.08		0.16			0.64			0.49	0.01
Control Delay		30.5	2.8		22.5			7.8			8.2	0.4
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		30.5	2.8		22.5			7.8			8.2	0.4
LOS		C	A		C			A			A	A
Approach Delay		21.6			22.5			7.8			8.1	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		15	0		7			149			181	0
Queue Length 95th (ft)		40	5		28			342			m257	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		229	320		250			1300			1289	1380
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		0.17	0.06		0.11			0.64			0.49	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 69.9%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

											
Ø2 (R)									Ø4		
53 s									17 s		
											
Ø6 (R)									Ø8		
53 s									17 s		

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	9	2	791	7	25	582	7
Future Volume (veh/h)	36	0	17	17	1	9	2	791	7	25	582	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	9	2	824	7	26	606	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	208	0	104	120	9	21	52	1294	11	78	1326	1319
Arrive On Green	0.05	0.00	0.07	0.05	0.07	0.05	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1599	0	1586	549	133	323	1	1620	14	30	1661	1652
Grp Volume(v), veh/h	38	0	18	28	0	0	833	0	0	632	0	7
Grp Sat Flow(s),veh/h/ln	1599	0	1586	1004	0	0	1634	0	0	1691	0	1652
Q Serve(g_s), s	0.0	0.0	0.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.8	2.4	0.0	0.0	14.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.64		0.32	0.00		0.01	0.04		1.00
Lane Grp Cap(c), veh/h	185	0	104	136	0	0	1333	0	0	1380	0	1319
V/C Ratio(X)	0.21	0.00	0.17	0.21	0.00	0.00	0.62	0.00	0.00	0.46	0.00	0.01
Avail Cap(c_a), veh/h	338	0	283	302	0	0	1333	0	0	1380	0	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.41	0.00	0.41
Uniform Delay (d), s/veh	31.7	0.0	30.9	32.4	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	0.7	0.0	0.0	2.2	0.0	0.0	0.5	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	0.3	0.5	0.0	0.0	2.3	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	0.0	31.7	33.1	0.0	0.0	5.1	0.0	0.0	0.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56		28			833			639			
Approach Delay, s/veh	32.1		33.1			5.1			0.4			
Approach LOS	C		C			A			A			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	60.9		9.1		60.9		9.1					
Change Period (Y+Rc), s	6.0		5.5		6.0		5.5					
Max Green Setting (Gmax), s	47.0		11.5		47.0		11.5					
Max Q Clear Time (g_c+I1), s	16.9		3.5		2.0		4.4					
Green Ext Time (p_c), s	22.5		0.1		22.4		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	4.7											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	225	49	3	189	206	77	374	11	117	245	210
Future Volume (vph)	268	225	49	3	189	206	77	374	11	117	245	210
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1718	0	1500	1509	1388
Flt Permitted	0.398			0.610			0.510			0.269		
Satd. Flow (perm)	622	1660	1088	765	1649	1561	879	1718	0	424	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		2				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	239	52	3	201	219	82	410	0	124	261	223
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	29.9	29.9	29.9	14.7	14.7	14.7	26.4	20.4		26.5	20.4	20.4
Actuated g/C Ratio	0.41	0.41	0.41	0.20	0.20	0.20	0.36	0.28		0.37	0.28	0.28
v/c Ratio	0.77	0.35	0.10	0.02	0.61	0.43	0.21	0.85		0.46	0.62	0.40
Control Delay	34.4	18.0	0.4	25.0	36.5	6.1	13.8	44.5		18.7	31.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	34.4	18.0	0.4	25.0	36.5	6.1	13.8	44.5		18.7	31.4	5.6
LOS	C	B	A	C	D	A	B	D		B	C	A
Approach Delay		24.5			20.7			39.3			19.3	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	100	80	0	1	89	0	20	177		32	104	0
Queue Length 95th (ft)	#213	135	0	8	155	44	49	#360		70	195	47

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	371	768	584	193	416	573	404	519		275	456	581
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.77	0.31	0.09	0.02	0.48	0.38	0.20	0.79		0.45	0.57	0.38

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 25.7

Intersection LOS: C

Intersection Capacity Utilization 73.7%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

			
Ø1	Ø2	Ø3	Ø4
15 s	23.5 s	14 s	27.5 s
			
Ø6	Ø7	Ø8	
38.5 s	14 s	27.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	225	49	3	189	206	77	374	11	117	245	210
Future Volume (veh/h)	268	225	49	3	189	206	77	374	11	117	245	210
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	285	239	39	3	201	0	82	398	10	124	261	193
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	416	691	487	251	324		371	490	12	310	423	375
Arrive On Green	0.14	0.40	0.40	0.19	0.19	0.00	0.07	0.24	0.23	0.10	0.28	0.28
Sat Flow, veh/h	1641	1709	1206	782	1724	1532	1988	2008	50	1522	1528	1352
Grp Volume(v), veh/h	285	239	39	3	201	0	82	0	408	124	261	193
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	782	1724	1532	1988	0	2058	1522	1528	1352
Q Serve(g_s), s	9.3	6.7	1.4	0.2	7.4	0.0	2.1	0.0	13.0	4.0	10.3	8.4
Cycle Q Clear(g_c), s	9.3	6.7	1.4	0.2	7.4	0.0	2.1	0.0	13.0	4.0	10.3	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	416	691	487	251	324		371	0	502	310	423	375
V/C Ratio(X)	0.68	0.35	0.08	0.01	0.62		0.22	0.00	0.81	0.40	0.62	0.52
Avail Cap(c_a), veh/h	416	812	573	306	447		466	0	637	332	473	418
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	14.3	12.8	23.0	25.9	0.0	17.7	0.0	24.8	17.6	21.9	21.2
Incr Delay (d2), s/veh	4.6	0.1	0.0	0.0	0.7	0.0	0.3	0.0	6.3	0.8	2.0	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	3.5	2.2	0.3	0.0	2.8	0.0	0.9	0.0	7.0	1.3	3.6	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	14.5	12.8	23.0	26.6	0.0	18.0	0.0	31.1	18.4	23.9	22.3
LnGrp LOS	C	B	B	C	C		B	A	C	B	C	C
Approach Vol, veh/h	563				204				490			
Approach Delay, s/veh	18.5				26.6				28.9			
Approach LOS	B				C				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	13.0	23.0		33.6	10.7	25.3				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	11.8	9.9	6.5	15.0		9.2	4.6	12.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0		0.1	0.0	1.5				

Intersection Summary

HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2028 No Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	320	397	24	26	3
Future Volume (vph)	3	320	397	24	26	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1723	0	1554	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1723	0	1554	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	352	462	0	32	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 32.3% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	320	397	24	26	3
Future Vol, veh/h	3	320	397	24	26	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	352	436	26	29	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	462	0	-	0	807	449
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	358	-
Critical Hdwy	4.4	-	-	-	6.84	6.7
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	3.3	-	-	-	3	3.4
Pot Cap-1 Maneuver	761	-	-	-	356	563
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	776	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	761	-	-	-	355	563
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	776	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		12.7		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	761	-	-	-	501	
HCM Lane V/C Ratio	0.004	-	-	-	0.064	
HCM Control Delay (s)	9.8	-	-	-	12.7	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2028 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	23	34	6	44	113	47	318	9	26	196	74
Future Volume (vph)	63	23	34	6	44	113	47	318	9	26	196	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1308	0	0	1540	0	0	1664	0	0	1524	0
Flt Permitted		0.974			0.998			0.994			0.996	
Satd. Flow (perm)	0	1308	0	0	1540	0	0	1664	0	0	1524	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	0	0	170	0	0	389	0	0	308	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	55.6%											
Analysis Period (min)	15											
	ICU Level of Service B											

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	63	23	34	6	44	113	47	318	9	26	196	74
Future Vol, veh/h	63	23	34	6	44	113	47	318	9	26	196	74
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	66	24	35	6	46	118	49	331	9	27	204	77
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.3	11	17.3	14.9
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	53%	4%	9%
Vol Thru, %	85%	19%	27%	66%
Vol Right, %	2%	28%	69%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	374	120	163	296
LT Vol	47	63	6	26
Through Vol	318	23	44	196
RT Vol	9	34	113	74
Lane Flow Rate	390	125	170	308
Geometry Grp	1	1	1	1
Degree of Util (X)	0.612	0.243	0.272	0.505
Departure Headway (Hd)	5.656	6.999	5.772	5.901
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	635	510	618	607
Service Time	3.717	5.084	3.851	3.968
HCM Lane V/C Ratio	0.614	0.245	0.275	0.507
HCM Control Delay	17.3	12.3	11	14.9
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	4.2	0.9	1.1	2.8

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	711	87	205	526	125	142
Future Volume (vph)	711	87	205	526	125	142
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1801	0	1744	1958	1578	0
Flt Permitted			0.089		0.977	
Satd. Flow (perm)	1801	0	163	1958	1578	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	11					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	877	0	225	578	293	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	0.95		0.84	0.45	0.89	
Control Delay	40.2		37.2	7.6	60.6	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	40.2		37.2	7.6	60.6	
LOS	D		D	A	E	
Approach Delay	40.2			15.9	60.6	
Approach LOS	D			B	E	
Queue Length 50th (ft)	388		50	130	143	
Queue Length 95th (ft)	#658		m#112	m161	#283	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	923		268	1292	331	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.95		0.84	0.45	0.89	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 33.3	Intersection LOS: C
Intersection Capacity Utilization 85.6%	ICU Level of Service E
Analysis Period (min) 15	
# 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.	

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	46 s	22 s
↖ Ø6 (R)		
58 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2028 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	711	87	205	526	125	142
Future Volume (veh/h)	711	87	205	526	125	142
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	781	87	225	578	137	156
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	799	89	280	1383	161	184
Arrive On Green	0.52	0.51	0.18	1.00	0.21	0.20
Sat Flow, veh/h	1534	171	1914	2090	775	882
Grp Volume(v), veh/h	0	868	225	578	294	0
Grp Sat Flow(s),veh/h/ln	0	1704	1914	2090	1663	0
Q Serve(g_s), s	0.0	39.8	4.2	0.0	13.6	0.0
Cycle Q Clear(g_c), s	0.0	39.8	4.2	0.0	13.6	0.0
Prop In Lane		0.10	1.00		0.47	0.53
Lane Grp Cap(c), veh/h	0	888	280	1383	346	0
V/C Ratio(X)	0.00	0.98	0.80	0.42	0.85	0.00
Avail Cap(c_a), veh/h	0	888	298	1383	349	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	18.7	16.7	0.0	30.7	0.0
Incr Delay (d2), s/veh	0.0	25.2	14.0	0.9	20.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	26.8	5.2	0.6	11.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	43.9	30.6	0.9	51.6	0.0
LnGrp LOS	A	D	C	A	D	A
Approach Vol, veh/h	868			803	294	
Approach Delay, s/veh	43.9			9.3	51.6	
Approach LOS	D			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.3	46.9		21.9		58.1
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	6.2	41.8		15.6		2.0
Green Ext Time (p_c), s	0.1	0.0		0.0		18.3
Intersection Summary						
HCM 6th Ctrl Delay			30.9			
HCM 6th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	831	0	0	976	104	1	0	2	41	0	83
Future Volume (vph)	84	831	0	0	976	104	1	0	2	41	0	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1741	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1741	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	894	0	0	1161	0	0	3	0	44	89	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 78.3%

ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	84	831	0	0	976	104	1	0	2	41	0	83
Future Vol, veh/h	84	831	0	0	976	104	1	0	2	41	0	83
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	90	894	0	0	1049	112	1	0	2	44	0	89

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1161	0	0	894	0	0	2225	2235	894	2180	2179	1106
Stage 1	-	-	-	-	-	-	1074	1074	-	1105	1105	-
Stage 2	-	-	-	-	-	-	1151	1161	-	1075	1074	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	568	-	-	434	-	-	42	55	375	51	67	294
Stage 1	-	-	-	-	-	-	332	337	-	339	347	-
Stage 2	-	-	-	-	-	-	302	309	-	352	357	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	568	-	-	434	-	-	26	46	375	45	56	294
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	46	-	45	56	-
Stage 1	-	-	-	-	-	-	280	284	-	285	347	-
Stage 2	-	-	-	-	-	-	210	309	-	295	301	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0	59.7	103.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	69	568	-	-	434	-	-	45	294
HCM Lane V/C Ratio	0.047	0.159	-	-	-	-	-	0.98	0.304
HCM Control Delay (s)	59.7	12.5	-	-	0	-	-	268.3	22.5
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.6	-	-	0	-	-	4	1.2

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	641	37	154	788	18	274	3	118	24	8	17
Future Volume (vph)	15	641	37	154	788	18	274	3	118	24	8	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1742	0
Flt Permitted	0.296			0.178			0.740			0.676		
Satd. Flow (perm)	515	1766	1550	295	1697	1608	1314	1576	0	1253	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40			123			18
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	668	39	160	821	19	285	126	0	25	26	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.5	37.5	37.5	51.6	50.3	50.3	19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.64	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.07	0.81	0.05	0.50	0.77	0.02	0.92	0.27		0.08	0.06	
Control Delay	11.9	18.6	0.2	11.0	7.7	0.1	66.2	7.1		24.7	14.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.9	18.6	0.2	11.0	7.7	0.1	66.2	7.1		24.7	14.0	
LOS	B	B	A	B	A	A	E	A		C	B	
Approach Delay		17.5			8.1			48.1			19.2	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	3	140	0	4	26	0	139	1		10	3	
Queue Length 95th (ft)	m5	m179	m0	m36	61	m0	#282	42		29	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	241	828	788	326	1067	1026	313	469		299	429	
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	0.07	0.81	0.05	0.49	0.77	0.02	0.91	0.27		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 19.0

Intersection LOS: B

Intersection Capacity Utilization 92.7%

ICU Level of Service F

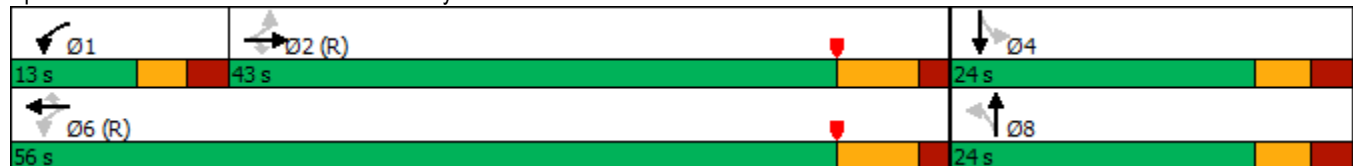
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	641	37	154	788	18	274	3	118	24	8	17
Future Volume (veh/h)	15	641	37	154	788	18	274	3	118	24	8	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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	16	668	24	160	821	16	285	3	83	25	8	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	446	999	858	566	1098	976	428	14	380	370	152	286
Arrive On Green	0.98	0.98	0.98	0.17	1.00	1.00	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	723	2032	1745	1666	1736	1542	1468	59	1626	1414	653	1224
Grp Volume(v), veh/h	16	668	24	160	821	16	285	0	86	25	0	23
Grp Sat Flow(s),veh/h/ln	723	2032	1745	1666	1736	1542	1468	0	1685	1414	0	1878
Q Serve(g_s), s	0.0	1.3	0.0	3.4	0.0	0.0	14.8	0.0	3.3	1.2	0.0	0.8
Cycle Q Clear(g_c), s	0.0	1.3	0.0	3.4	0.0	0.0	15.1	0.0	3.3	4.0	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.65
Lane Grp Cap(c), veh/h	446	999	858	566	1098	976	428	0	393	370	0	438
V/C Ratio(X)	0.04	0.67	0.03	0.28	0.75	0.02	0.67	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	446	999	858	602	1098	976	436	0	402	377	0	448
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(l)	1.00	1.00	1.00	0.70	0.70	0.70	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.3	0.3	0.3	6.3	0.0	0.0	29.4	0.0	25.2	26.2	0.0	24.0
Incr Delay (d2), s/veh	0.2	3.5	0.1	0.2	3.3	0.0	3.7	0.0	0.3	0.1	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(95%),veh/ln	0.0	2.1	0.0	1.6	1.8	0.0	9.4	0.0	2.4	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	3.9	0.4	6.5	3.3	0.0	33.2	0.0	25.4	26.3	0.0	24.1
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	708			997			371			48		
Approach Delay, s/veh	3.7			3.8			31.4			25.2		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	11.3	45.1	23.6			56.4	23.6					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2	* 18					
Max Q Clear Time (g_c+I1), s	5.9	3.8	6.5			2.5	17.6					
Green Ext Time (p_c), s	0.1	0.8	0.1			1.0	0.1					

Intersection Summary

HCM 6th Ctrl Delay	9.0
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	466	1	10	793	75	9	2	1	42	3	114
Future Volume (vph)	86	466	1	10	793	75	9	2	1	42	3	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.206			0.484				0.717		0.750		
Satd. Flow (perm)	363	1729	0	808	1818	1561	0	1356	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			120	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	492	0	11	835	79	0	12	0	44	123	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.9	64.1		55.3	55.3	55.3		9.2		9.2	9.2	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.23	0.35		0.02	0.66	0.07		0.08		0.28	0.44	
Control Delay	3.6	6.1		4.7	11.7	0.6		30.0		36.2	12.2	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0		0.0	0.0	
Total Delay	3.6	6.1		4.7	11.8	0.6		30.0		36.2	12.2	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		5.7			10.8			30.0			18.5	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	10	138		1	325	0		5		21	1	
Queue Length 95th (ft)	m17	m213		m2	353	m1		19		49	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	396	1386		558	1257	1113		227		227	352	
Starvation Cap Reductn	0	0		0	46	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	0.23	0.35		0.02	0.69	0.07		0.05		0.19	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 9.9

Intersection LOS: A

Intersection Capacity Utilization 69.0%

ICU Level of Service C

Analysis Period (min) 15

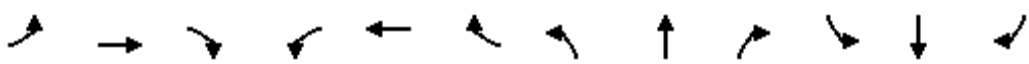
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary 10: Driveway/Market Sq Dr & SR 0230

2028 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	466	1	10	793	75	9	2	1	42	3	114
Future Volume (veh/h)	86	466	1	10	793	75	9	2	1	42	3	114
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	91	491	1	11	835	70	9	2	0	44	3	64
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	563	1339	3	693	1335	1140	112	19	0	209	5	114
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.06	0.08	0.00	0.08	0.08	0.06
Sat Flow, veh/h	1629	1679	3	874	1935	1652	398	248	0	1376	69	1475
Grp Volume(v), veh/h	91	0	492	11	835	70	11	0	0	44	0	67
Grp Sat Flow(s),veh/h/ln	1629	0	1682	874	1935	1652	645	0	0	1376	0	1544
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	1.9	0.0	3.4
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.96
Lane Grp Cap(c), veh/h	563	0	1342	693	1335	1140	123	0	0	209	0	119
V/C Ratio(X)	0.16	0.00	0.37	0.02	0.63	0.06	0.09	0.00	0.00	0.21	0.00	0.56
Avail Cap(c_a), veh/h	611	0	1342	693	1335	1140	250	0	0	333	0	259
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(l)	0.53	0.00	0.53	0.69	0.69	0.69	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.1	0.0	0.0	0.0	0.0	0.0	34.7	0.0	0.0	35.0	0.0	36.1
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.5	0.1	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.0	0.0	0.4	0.0	0.0	1.5	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.0	0.4	0.0	1.5	0.1	35.0	0.0	0.0	35.5	0.0	40.2
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	583			916			11			111		
Approach Delay, s/veh	0.7			1.4			35.0			38.3		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.6	60.6		10.8		69.2		10.8				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.6	2.5		5.4		2.5		5.4				
Green Ext Time (p_c), s	0.0	1.2		0.2		0.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				3.9								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	408	24	41	673	64	97	47	30	53	51	97
Future Volume (vph)	67	408	24	41	673	64	97	47	30	53	51	97
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1708	0	1573	1668	0	1572	1620	0	0	1818	0
Flt Permitted	0.280			0.470			0.489				0.884	
Satd. Flow (perm)	487	1708	0	778	1668	0	808	1620	0	0	1628	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			9			32			63	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	454	0	43	775	0	102	81	0	0	212	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	55.4	55.4		55.4	55.4		14.7	14.7			14.7	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.18	0.18			0.18	
v/c Ratio	0.21	0.38		0.08	0.67		0.69	0.25			0.61	
Control Delay	2.2	1.6		5.9	12.0		52.5	18.7			27.2	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0			0.0	
Total Delay	2.2	1.6		5.9	12.1		52.5	18.7			27.2	
LOS	A	A		A	B		D	B			C	
Approach Delay		1.7			11.8			37.5			27.2	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	2	8		6	184		48	21			68	
Queue Length 95th (ft)	3	9		21	412		91	51			122	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	337	1184		538	1157		272	567			591	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	24		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.21	0.38		0.08	0.68		0.38	0.14			0.36	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 13.3

Intersection LOS: B

Intersection Capacity Utilization 85.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)	 Ø4
48 s	32 s
 Ø6 (R)	 Ø8
48 s	32 s

HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2028 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	408	24	41	673	64	97	47	30	53	51	97
Future Volume (veh/h)	67	408	24	41	673	64	97	47	30	53	51	97
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	71	429	24	43	708	65	102	49	14	56	54	81
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	425	1153	64	764	1232	113	241	200	57	117	90	109
Arrive On Green	1.00	1.00	1.00	0.72	0.72	0.71	0.16	0.16	0.14	0.14	0.16	0.14
Sat Flow, veh/h	642	1602	90	937	1712	157	1172	1276	365	375	574	699
Grp Volume(v), veh/h	71	0	453	43	0	773	102	0	63	191	0	0
Grp Sat Flow(s),veh/h/ln	642	0	1691	937	0	1869	1172	0	1641	1648	0	0
Q Serve(g_s), s	2.9	0.0	0.0	1.1	0.0	15.9	0.0	0.0	2.7	6.3	0.0	0.0
Cycle Q Clear(g_c), s	18.7	0.0	0.0	1.1	0.0	15.9	8.8	0.0	2.7	9.0	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.08	1.00		0.22	0.29		0.42
Lane Grp Cap(c), veh/h	425	0	1217	764	0	1345	241	0	257	296	0	0
V/C Ratio(X)	0.17	0.00	0.37	0.06	0.00	0.57	0.42	0.00	0.25	0.65	0.00	0.00
Avail Cap(c_a), veh/h	425	0	1217	764	0	1345	453	0	554	598	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(l)	0.95	0.00	0.95	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.6	0.0	0.0	3.3	0.0	5.4	32.2	0.0	29.7	32.6	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.8	0.1	0.0	1.8	1.2	0.0	0.5	2.4	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(95%),veh/ln	0.4	0.0	0.5	0.3	0.0	8.0	3.4	0.0	1.9	6.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.4	0.0	0.8	3.4	0.0	7.2	33.4	0.0	30.2	35.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	524			816			165			191		
Approach Delay, s/veh	1.2			7.0			32.1			35.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	62.5			17.5			62.5			17.5		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			11.0			17.9			10.8		
Green Ext Time (p_c), s	13.3			0.5			18.1			0.5		
Intersection Summary												
HCM 6th Ctrl Delay			10.8									
HCM 6th LOS			B									
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	631	0	124	316	162	0	0	251	48
Future Volume (vph)	0	0	0	631	0	124	316	162	0	0	251	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.363					
Satd. Flow (perm)	0	0	0	0	1653	1414	607	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	664	131	333	171	0	0	264	51
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.5	25.5	29.1	29.1			16.1	16.1
Actuated g/C Ratio					0.40	0.40	0.45	0.45			0.25	0.25
v/c Ratio					1.01	0.20	0.84	0.25			0.63	0.10
Control Delay					61.0	2.9	34.6	11.9			29.1	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					61.0	2.9	34.6	11.9			29.1	0.4
LOS					E	A	C	B			C	A
Approach Delay					51.4			26.9			24.5	
Approach LOS					D			C			C	
Queue Length 50th (ft)					~269	0	85	39			92	0
Queue Length 95th (ft)					#472	23	#201	75			163	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 No Build

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					657	653	398	707			439	539
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					1.01	0.20	0.84	0.24			0.60	0.09

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 64.1

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 38.5

Intersection LOS: D

Intersection Capacity Utilization 136.8%

ICU Level of Service H

Analysis Period (min) 15

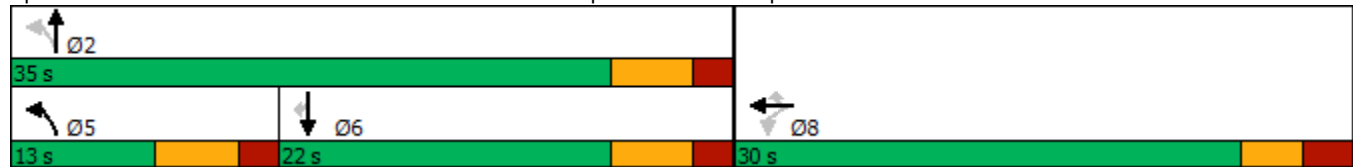
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	631	0	124	316	162	0	0	251	48
Future Volume (veh/h)	0	0	0	631	0	124	316	162	0	0	251	48
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				664	0	0	333	171	0	0	264	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				731	0		424	685	0	0	390	
Arrive On Green				0.39	0.00	0.00	0.13	0.43	0.00	0.00	0.22	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				664	0	0	333	171	0	0	264	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				21.2	0.0	0.0	8.0	4.2	0.0	0.0	8.2	0.0
Cycle Q Clear(g_c), s				21.2	0.0	0.0	8.0	4.2	0.0	0.0	8.2	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				731	0		424	685	0	0	390	
V/C Ratio(X)				0.91	0.00		0.79	0.25	0.00	0.00	0.68	
Avail Cap(c_a), veh/h				753	0		424	785	0	0	503	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.3	0.0	0.0	17.0	10.9	0.0	0.0	21.7	0.0
Incr Delay (d2), s/veh				14.6	0.0	0.0	9.5	0.7	0.0	0.0	7.3	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
%ile BackOfQ(95%),veh/ln				16.2	0.0	0.0	7.2	2.4	0.0	0.0	6.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.9	0.0	0.0	26.4	11.6	0.0	0.0	29.0	0.0
LnGrp LOS				C	A		C	B	A	A	C	
Approach Vol, veh/h					664			504			264	
Approach Delay, s/veh					31.9			21.4			29.0	
Approach LOS					C			C			C	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	31.2			13.0			18.2			29.3		
Change Period (Y+Rc), s	6.0			6.0			6.0			5.5		
Max Green Setting (Gmax), s	29.0			7.0			16.0			24.5		
Max Q Clear Time (g_c+I1), s	6.2			10.0			10.2			23.2		
Green Ext Time (p_c), s	3.4			0.0			2.0			0.5		
Intersection Summary												
HCM 6th Ctrl Delay	27.7											
HCM 6th LOS	C											

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	3	550	0	0	0	0	439	488	100	790	0
Future Volume (vph)	44	3	550	0	0	0	0	439	488	100	790	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1563	1569	0	0	0	0	1666	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1563	1569	0	0	0	0	1666	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	567	0	0	0	0	956	0	103	814	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 136.8%												
ICU Level of Service H												
Analysis Period (min) 15												

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2028 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh	45.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	44	3	550	0	0	0	0	439	488	100	790	0
Future Vol, veh/h	44	3	550	0	0	0	0	439	488	100	790	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	45	3	567	0	0	0	0	453	503	103	814	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1473	1473	814	-	0	0	453	0	0
Stage 1	1020	1020	-	-	-	-	-	-	-
Stage 2	453	453	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	130	164	~ 425	0	-	-	848	-	0
Stage 1	416	375	-	0	-	-	-	-	0
Stage 2	729	618	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	114	0	~ 425	-	-	-	848	-	-
Mov Cap-2 Maneuver	114	0	-	-	-	-	-	-	-
Stage 1	416	0	-	-	-	-	-	-	-
Stage 2	641	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	181.7	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	114	425	848	-
HCM Lane V/C Ratio	-	-	0.425	1.334	0.122	-
HCM Control Delay (s)	-	-	58.1	192.3	9.8	-
HCM Lane LOS	-	-	F	F	A	-
HCM 95th %tile Q(veh)	-	-	1.8	25.9	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 No Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	911	1313	10
Future Volume (vph)	3	9	8	911	1313	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1801	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	947	1364	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	79.7%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 No Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	911	1313	10
Future Vol, veh/h	3	9	8	911	1313	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	939	1354	10

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2314	1359	1364	0	-	0
Stage 1	1359	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	44	190	458	-	-	-
Stage 1	261	-	-	-	-	-
Stage 2	415	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	42	190	458	-	-	-
Mov Cap-2 Maneuver	42	-	-	-	-	-
Stage 1	251	-	-	-	-	-
Stage 2	415	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	45.6	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	458	-	101	-	-
HCM Lane V/C Ratio	0.018	-	0.122	-	-
HCM Control Delay (s)	13	0	45.6	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	323	34	103	9	41	36	91	567	13	50	829	447
Future Volume (vph)	323	34	103	9	41	36	91	567	13	50	829	447
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1666	0	1416	1704	0	1620	1695	0	1628	1653	0
Flt Permitted	0.704			0.665			0.107			0.363		
Satd. Flow (perm)	1200	1666	0	991	1704	0	182	1695	0	622	1653	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		108			38			4			86	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	340	144	0	9	81	0	96	611	0	53	1344	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	1.42	0.34		0.05	0.22		0.85	0.58		0.14	1.26	
Control Delay	235.8	10.2		20.2	14.2		69.7	12.8		5.7	142.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	235.8	10.2		20.2	14.2		69.7	12.8		5.7	142.2	
LOS	F	B		C	B		E	B		A	F	
Approach Delay		168.7			14.8			20.5			137.0	
Approach LOS		F			B			C			F	
Queue Length 50th (ft)	~171	11		3	13		41	258		7	~626	
Queue Length 95th (ft)	#310	51		13	44		#151	294		19	#856	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	419		198	371		113	1060		388	1065	
Starvation Cap Reductn	0	0		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	1.42	0.34		0.05	0.22		0.85	0.58		0.14	1.26	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.42

Intersection Signal Delay: 107.9

Intersection LOS: F

Intersection Capacity Utilization 114.1%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary 11: Cloverleaf Rd & Schwanger Rd

2028 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	323	34	103	9	41	36	91	567	13	50	829	447
Future Volume (veh/h)	323	34	103	9	41	36	91	567	13	50	829	447
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	340	36	84	9	43	24	96	597	13	53	873	460
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	355	110	257	276	219	122	120	1130	25	400	740	390
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1407	550	1284	1085	1097	612	420	1808	39	845	1184	624
Grp Volume(v), veh/h	340	0	120	9	0	67	96	0	610	53	0	1333
Grp Sat Flow(s),veh/h/ln	1407	0	1835	1085	0	1710	420	0	1848	845	0	1808
Q Serve(g_s), s	10.0	0.0	3.4	0.4	0.0	2.0	0.0	0.0	17.6	2.7	0.0	37.5
Cycle Q Clear(g_c), s	12.0	0.0	3.4	3.8	0.0	2.0	37.5	0.0	17.6	20.3	0.0	37.5
Prop In Lane	1.00		0.70	1.00		0.36	1.00		0.02	1.00		0.35
Lane Grp Cap(c), veh/h	355	0	367	276	0	342	120	0	1155	400	0	1130
V/C Ratio(X)	0.96	0.00	0.33	0.03	0.00	0.20	0.80	0.00	0.53	0.13	0.00	1.18
Avail Cap(c_a), veh/h	355	0	367	276	0	342	120	0	1155	400	0	1130
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.81	0.00	0.81	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	20.9	22.2	0.0	20.1	42.6	0.0	15.9	14.3	0.0	11.4
Incr Delay (d2), s/veh	36.5	0.0	0.5	0.0	0.0	0.3	35.0	0.0	1.4	0.7	0.0	90.1
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(95%),veh/ln	12.9	0.0	2.5	0.2	0.0	1.3	4.8	0.0	13.1	0.9	0.0	53.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	0.0	21.4	22.2	0.0	20.4	77.6	0.0	17.3	15.0	0.0	101.6
LnGrp LOS	E	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	460			76			706			1386		
Approach Delay, s/veh	52.2			20.6			25.5			98.3		
Approach LOS	D			C			C			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	19.6			14.0			39.5			5.8		
Green Ext Time (p_c), s	10.8			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	68.4											
HCM 6th LOS	E											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	62	0	39	17	617	5	10	896	35
Future Volume (vph)	15	0	18	62	0	39	17	617	5	10	896	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1672	0	0	1640	0	0	1722	1648
Flt Permitted		0.767			0.803			0.970			0.992	
Satd. Flow (perm)	0	1335	1581	0	1384	0	0	1592	0	0	1710	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	106	0	0	672	0	0	954	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.6	8.6		8.6			45.1			45.1	45.1
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.08	0.07		0.43			0.56			0.74	0.03
Control Delay		22.1	1.7		18.5			7.8			4.6	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		22.1	1.7		18.5			7.8			4.6	0.1
LOS		C	A		B			A			A	A
Approach Delay		11.1			18.5			7.8			4.4	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		17			254			26	0
Queue Length 95th (ft)		19	4		54			205			m34	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		233	322		287			1196			1285	1249
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		0.07	0.06		0.37			0.56			0.74	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 6.6

Intersection LOS: A

Intersection Capacity Utilization 75.2%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	62	0	39	17	617	5	10	896	35
Future Volume (veh/h)	15	0	18	62	0	39	17	617	5	10	896	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	65	0	26	18	649	5	11	943	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	289	0	165	200	3	40	74	1209	9	65	1351	1218
Arrive On Green	0.09	0.00	0.10	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1617	0	1586	936	31	387	16	1640	12	6	1832	1652
Grp Volume(v), veh/h	16	0	11	91	0	0	672	0	0	954	0	36
Grp Sat Flow(s),veh/h/ln	1617	0	1586	1353	0	0	1669	0	0	1838	0	1652
Q Serve(g_s), s	0.0	0.0	0.4	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.4	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.71		0.29	0.03		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	262	0	165	221	0	0	1264	0	0	1385	0	1218
V/C Ratio(X)	0.06	0.00	0.07	0.41	0.00	0.00	0.53	0.00	0.00	0.69	0.00	0.03
Avail Cap(c_a), veh/h	356	0	278	324	0	0	1264	0	0	1385	0	1218
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	24.8	0.0	24.2	26.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.2	0.0	0.0	1.6	0.0	0.0	0.3	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(95%),veh/ln	0.4	0.0	0.3	2.4	0.0	0.0	1.0	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	24.4	27.8	0.0	0.0	1.6	0.0	0.0	0.3	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	27			91			672			990		
Approach Delay, s/veh	24.7			27.8			1.6			0.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.2			10.8			49.2			10.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.5			2.0			6.0		
Green Ext Time (p_c), s	21.3			0.0			30.3			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	221	310	67	23	338	146	107	307	18	230	373	294
Future Volume (vph)	221	310	67	23	338	146	107	307	18	230	373	294
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1810	0	1604	1640	1442
Flt Permitted	0.205			0.567			0.392			0.323		
Satd. Flow (perm)	343	1791	1435	903	1697	1577	628	1810	0	545	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		2				303
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	228	320	69	24	348	151	110	335	0	237	385	303
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	51.2	51.2	51.2	29.0	29.0	29.0	46.2	37.5		56.4	42.6	42.6
Actuated g/C Ratio	0.43	0.43	0.43	0.24	0.24	0.24	0.38	0.31		0.47	0.36	0.36
v/c Ratio	0.72	0.42	0.10	0.11	0.85	0.30	0.36	0.59		0.63	0.66	0.43
Control Delay	34.9	24.8	1.5	33.4	61.8	5.7	24.5	42.0		23.1	33.5	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	34.9	24.8	1.5	33.4	61.8	5.7	24.5	42.0		23.1	33.5	7.0
LOS	C	C	A	C	E	A	C	D		C	C	A
Approach Delay		25.9			44.3			37.7			22.2	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	114	167	0	15	258	0	48	220		103	210	37
Queue Length 95th (ft)	152	210	11	35	337	43	97	#389		m157	#454	m77
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	327	932	795	297	558	625	310	566		380	582	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.70	0.34	0.09	0.08	0.62	0.24	0.35	0.59		0.62	0.66	0.43

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 30.4

Intersection LOS: C

Intersection Capacity Utilization 82.5%

ICU Level of Service E

Analysis Period (min) 15

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4 (R)
23 s	45 s	20 s	32 s
 Ø6	 Ø7	 Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	310	67	23	338	146	107	307	18	230	373	294
Future Volume (veh/h)	221	310	67	23	338	146	107	307	18	230	373	294
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	228	320	39	24	348	0	110	316	18	237	385	232
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	310	717	612	268	390		383	695	40	464	655	555
Arrive On Green	0.13	0.39	0.39	0.22	0.22	0.00	0.06	0.34	0.34	0.16	0.53	0.53
Sat Flow, veh/h	1736	1823	1557	943	1766	1544	1880	2020	115	1616	1655	1402
Grp Volume(v), veh/h	228	320	39	24	348	0	110	0	334	237	385	232
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	943	1766	1544	1880	0	2135	1616	1655	1402
Q Serve(g_s), s	11.5	15.5	1.9	2.4	22.9	0.0	4.4	0.0	14.6	10.8	19.1	12.0
Cycle Q Clear(g_c), s	11.5	15.5	1.9	2.4	22.9	0.0	4.4	0.0	14.6	10.8	19.1	12.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	310	717	612	268	390		383	0	735	464	655	555
V/C Ratio(X)	0.74	0.45	0.06	0.09	0.89		0.29	0.00	0.45	0.51	0.59	0.42
Avail Cap(c_a), veh/h	343	950	811	370	581		402	0	735	464	655	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	26.8	22.7	37.4	45.3	0.0	23.1	0.0	30.6	19.5	21.7	20.0
Incr Delay (d2), s/veh	7.2	0.2	0.0	0.1	8.4	0.0	0.4	0.0	2.0	0.9	3.8	2.3
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(95%),veh/ln	9.0	10.7	1.2	1.0	16.0	0.0	3.7	0.0	12.7	6.8	11.3	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.1	26.9	22.7	37.4	53.8	0.0	23.5	0.0	32.6	20.5	25.5	22.3
LnGrp LOS	D	C	C	D	D		C	A	C	C	C	C
Approach Vol, veh/h	587				372				444			
Approach Delay, s/veh	31.0				52.7				30.4			
Approach LOS	C				D				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.7	32.0	20.0	47.3		52.7	13.8	53.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	14.0	25.4	13.3	16.6		18.0	6.9	21.6				
Green Ext Time (p_c), s	0.2	0.1	0.0	1.0		0.1	0.0	2.2				

Intersection Summary

HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2028 No Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	509	454	57	38	1
Future Volume (vph)	6	509	454	57	38	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1765	0	1668	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1765	0	1668	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	530	532	0	41	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 37.4% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	509	454	57	38	1
Future Vol, veh/h	6	509	454	57	38	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	530	473	59	40	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	532	0	-	0	1045
Stage 1	-	-	-	-	503
Stage 2	-	-	-	-	542
Critical Hdwy	4.1	-	-	-	6.8
Critical Hdwy Stg 1	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	5.8
Follow-up Hdwy	3	-	-	-	3
Pot Cap-1 Maneuver	811	-	-	-	250
Stage 1	-	-	-	-	653
Stage 2	-	-	-	-	623
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	811	-	-	-	248
Mov Cap-2 Maneuver	-	-	-	-	403
Stage 1	-	-	-	-	648
Stage 2	-	-	-	-	623

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	811	-	-	-	406
HCM Lane V/C Ratio	0.008	-	-	-	0.1
HCM Control Delay (s)	9.5	-	-	-	14.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2028 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	83	78	4	52	56	33	297	6	86	341	48
Future Volume (vph)	79	83	78	4	52	56	33	297	6	86	341	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1396	0	0	1575	0	0	1670	0	0	1576	0
Flt Permitted		0.984			0.998			0.995			0.991	
Satd. Flow (perm)	0	1396	0	0	1575	0	0	1670	0	0	1576	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	249	0	0	116	0	0	349	0	0	495	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	69.2%											
Analysis Period (min)	15											
ICU Level of Service C												

Intersection	
Intersection Delay, s/veh	30
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	79	83	78	4	52	56	33	297	6	86	341	48
Future Vol, veh/h	79	83	78	4	52	56	33	297	6	86	341	48
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	82	86	81	4	54	58	34	309	6	90	355	50
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	19.2	12.6	21.6	45.6
HCM LOS	C	B	C	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	33%	4%	18%
Vol Thru, %	88%	35%	46%	72%
Vol Right, %	2%	33%	50%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	336	240	112	475
LT Vol	33	79	4	86
Through Vol	297	83	52	341
RT Vol	6	78	56	48
Lane Flow Rate	350	250	117	495
Geometry Grp	1	1	1	1
Degree of Util (X)	0.652	0.533	0.235	0.91
Departure Headway (Hd)	6.705	7.672	7.259	6.624
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	536	468	491	544
Service Time	4.779	5.748	5.359	4.689
HCM Lane V/C Ratio	0.653	0.534	0.238	0.91
HCM Control Delay	21.6	19.2	12.6	45.6
HCM Lane LOS	C	C	B	E
HCM 95th-tile Q	4.7	3.1	0.9	10.9

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	625	84	133	532	90	127
Future Volume (vph)	625	84	133	532	90	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1835	0	1761	1958	1577	0
Flt Permitted			0.215		0.980	
Satd. Flow (perm)	1835	0	399	1958	1577	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	8					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	716	0	134	537	219	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	62.5		76.3	75.1	24.5	
Actuated g/C Ratio	0.57		0.69	0.68	0.22	
v/c Ratio	0.68		0.35	0.40	0.63	
Control Delay	22.3		7.5	8.6	46.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	22.3		7.5	8.6	46.0	
LOS	C		A	A	D	
Approach Delay	22.3			8.4	46.0	
Approach LOS	C			A	D	
Queue Length 50th (ft)	338		32	167	140	
Queue Length 95th (ft)	562		m48	m246	203	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1046		388	1337	570	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.68		0.35	0.40	0.38	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 19.7

Intersection LOS: B

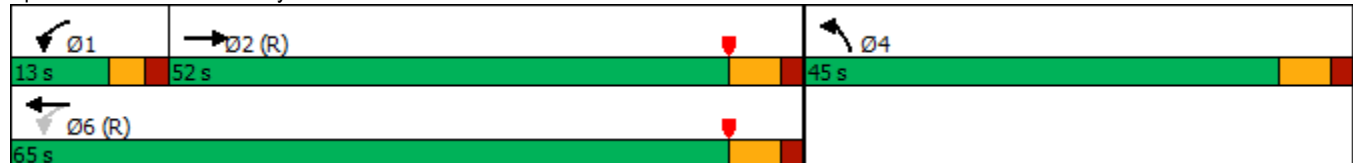
Intersection Capacity Utilization 73.4%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary 3: Maytown Rd & SR 0230

2028 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	625	84	133	532	90	127
Future Volume (veh/h)	625	84	133	532	90	127
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	631	83	134	537	91	128
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	980	129	479	1529	120	169
Arrive On Green	0.64	0.63	0.05	0.73	0.17	0.16
Sat Flow, veh/h	1527	201	1927	2090	689	969
Grp Volume(v), veh/h	0	714	134	537	220	0
Grp Sat Flow(s),veh/h/ln	0	1728	1927	2090	1666	0
Q Serve(g_s), s	0.0	27.8	2.4	10.2	13.9	0.0
Cycle Q Clear(g_c), s	0.0	27.8	2.4	10.2	13.9	0.0
Prop In Lane		0.12	1.00		0.41	0.58
Lane Grp Cap(c), veh/h	0	1109	479	1529	290	0
V/C Ratio(X)	0.00	0.64	0.28	0.35	0.76	0.00
Avail Cap(c_a), veh/h	0	1109	533	1529	603	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.1	9.7	5.3	43.5	0.0
Incr Delay (d2), s/veh	0.0	2.9	0.3	0.6	13.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	15.8	1.6	7.1	11.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	15.0	10.0	6.0	57.2	0.0
LnGrp LOS	A	B	B	A	E	A
Approach Vol, veh/h	714			671	220	
Approach Delay, s/veh	15.0			6.8	57.2	
Approach LOS	B			A	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.9	75.8		24.3		85.7
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	4.4	29.8		15.9		12.2
Green Ext Time (p_c), s	0.1	11.2		2.3		16.1
Intersection Summary						
HCM 6th Ctrl Delay			17.3			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	813	0	1	831	103	0	0	1	49	0	36
Future Volume (vph)	17	813	0	1	831	103	0	0	1	49	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	847	0	1	973	0	0	1	0	51	38	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 66.0% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	813	0	1	831	103	0	0	1	49	0	36
Future Vol, veh/h	17	813	0	1	831	103	0	0	1	49	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	847	0	1	866	107	0	0	1	51	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	973	0	0	847	0	0	1824	1858	847	1806	1805	920
Stage 1	-	-	-	-	-	-	883	883	-	922	922	-
Stage 2	-	-	-	-	-	-	941	975	-	884	883	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	644	-	-	459	-	-	78	91	399	89	108	372
Stage 1	-	-	-	-	-	-	419	404	-	420	410	-
Stage 2	-	-	-	-	-	-	390	370	-	439	425	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	644	-	-	459	-	-	69	88	399	87	105	372
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	88	-	87	105	-
Stage 1	-	-	-	-	-	-	407	393	-	408	409	-
Stage 2	-	-	-	-	-	-	350	369	-	426	413	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	14	60.5
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	399	644	-	-	459	-	-	87	372
HCM Lane V/C Ratio	0.003	0.027	-	-	0.002	-	-	0.587	0.101
HCM Control Delay (s)	14	10.7	-	-	12.9	-	-	93.3	15.8
HCM Lane LOS	B	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	2.7	0.3

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	573	50	155	668	16	260	3	163	35	4	15
Future Volume (vph)	22	573	50	155	668	16	260	3	163	35	4	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1740	0
Flt Permitted	0.384			0.268			0.744			0.538		
Satd. Flow (perm)	667	1783	1584	443	1697	1573	1327	1574	0	997	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			172			16
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	603	53	163	703	17	274	175	0	37	20	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	58.9	58.9	58.9	75.4	74.1	74.1	25.2	25.2		25.2	25.2	
Actuated g/C Ratio	0.54	0.54	0.54	0.69	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.06	0.63	0.06	0.39	0.62	0.02	0.90	0.36		0.16	0.05	
Control Delay	14.3	17.9	2.5	7.6	9.2	0.8	74.2	7.7		35.5	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.3	17.9	2.5	7.6	9.2	0.8	74.2	7.7		35.5	16.9	
LOS	B	B	A	A	A	A	E	A		D	B	
Approach Delay		16.6			8.8			48.3			29.0	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	6	171	0	27	152	0	187	2		21	2	
Queue Length 95th (ft)	m15	301	m6	44	219	m1	#338	56		50	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	357	954	886	483	1143	1069	314	504		236	425	
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	0.06	0.63	0.06	0.34	0.62	0.02	0.87	0.35		0.16	0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 20.5

Intersection LOS: C

Intersection Capacity Utilization 86.0%

ICU Level of Service E

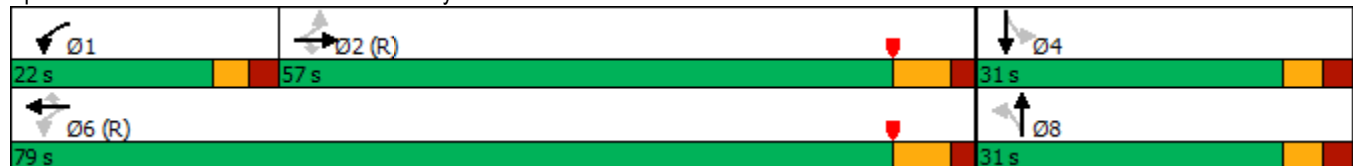
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2028 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	573	50	155	668	16	260	3	163	35	4	15
Future Volume (veh/h)	22	573	50	155	668	16	260	3	163	35	4	15
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	603	31	163	703	12	274	3	107	37	4	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	532	1179	1005	612	1195	1060	383	10	352	293	123	278
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	810	2047	1743	1666	1736	1540	1488	46	1644	1388	576	1296
Grp Volume(v), veh/h	23	603	31	163	703	12	274	0	110	37	0	13
Grp Sat Flow(s),veh/h/ln	810	2047	1743	1666	1736	1540	1488	0	1690	1388	0	1871
Q Serve(g_s), s	0.0	0.0	0.0	4.1	0.0	0.0	19.5	0.0	6.1	2.5	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.1	0.0	0.0	19.6	0.0	6.1	8.1	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.69
Lane Grp Cap(c), veh/h	532	1179	1005	612	1195	1060	383	0	362	293	0	401
V/C Ratio(X)	0.04	0.51	0.03	0.27	0.59	0.01	0.72	0.00	0.30	0.13	0.00	0.03
Avail Cap(c_a), veh/h	532	1179	1005	758	1195	1060	417	0	401	325	0	444
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)	1.00	1.00	1.00	0.81	0.81	0.81	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.2	0.0	0.0	41.7	0.0	36.7	39.5	0.0	34.5
Incr Delay (d2), s/veh	0.2	1.6	0.1	0.2	1.7	0.0	5.3	0.0	0.5	0.2	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(95%),veh/ln	0.0	0.9	0.0	2.1	1.0	0.0	12.3	0.0	4.7	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	1.6	0.1	6.4	1.7	0.0	47.0	0.0	37.2	39.7	0.0	34.5
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	657				878				384			
Approach Delay, s/veh	1.5				2.6				44.2			
Approach LOS	A				A				D			
Timer - Assigned Phs	1		2		4		6		8			
Phs Duration (G+Y+Rc), s	12.3		69.2		28.5		81.5		28.5			
Change Period (Y+Rc), s	5.5		6.8		* 5.9		6.8		* 5.9			
Max Green Setting (Gmax), s	16.5		50.2		* 25		72.2		* 25			
Max Q Clear Time (g_c+I1), s	6.6		2.5		10.6		2.5		22.1			
Green Ext Time (p_c), s	0.3		0.7		0.1		0.8		0.4			

Intersection Summary

HCM 6th Ctrl Delay 11.2
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	519	12	4	650	57	9	3	10	62	39	130
Future Volume (vph)	109	519	12	4	650	57	9	3	10	62	39	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1742	0	1744	1818	1561	0	1765	0	1719	1573	0
Flt Permitted	0.294			0.450				0.590		0.742		
Satd. Flow (perm)	519	1742	0	826	1818	1561	0	1062	0	1342	1573	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		11			139	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	571	0	4	699	61	0	24	0	67	182	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.9	88.0		75.3	75.3	75.3		12.0		12.0	12.0	
Actuated g/C Ratio	0.81	0.80		0.68	0.68	0.68		0.11		0.11	0.11	
v/c Ratio	0.23	0.41		0.01	0.56	0.06		0.19		0.46	0.62	
Control Delay	4.1	5.0		6.5	13.0	1.4		32.1		55.0	22.4	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.1	5.0		6.5	13.2	1.4		32.1		55.0	22.4	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		4.9			12.2			32.1			31.2	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	16	88		1	285	2		8		45	28	
Queue Length 95th (ft)	m30	186		m3	460	6		33		87	95	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	519	1394		565	1244	1094		234		285	444	
Starvation Cap Reductn	0	0		0	117	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	0.23	0.41		0.01	0.62	0.06		0.10		0.24	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 12.3

Intersection LOS: B

Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
14 s	68 s	28 s
 Ø5 (R)		 Ø8
82 s		28 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2028 No Build
SAT Peak Hour

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	109	519	12	4	650	57	9	3	10	62	39	130								
Future Volume (veh/h)	109	519	12	4	650	57	9	3	10	62	39	130								
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		0.99	1.00		0.99								
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837								
Adj Flow Rate, veh/h	117	558	11	4	699	48	10	3	7	67	42	69								
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93								
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0								
Cap, veh/h	616	1347	27	701	1400	1195	67	27	24	191	60	99								
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09								
Sat Flow, veh/h	1629	1658	33	878	1935	1652	183	283	251	1375	623	1023								
Grp Volume(v), veh/h	117	0	569	4	699	48	20	0	0	67	0	111								
Grp Sat Flow(s),veh/h/ln	1629	0	1691	878	1935	1652	717	0	0	1375	0	1646								
Q Serve(g_s), s	1.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.2								
Cycle Q Clear(g_c), s	1.8	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	5.6	0.0	7.2								
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.35	1.00		0.62								
Lane Grp Cap(c), veh/h	616	0	1374	701	1400	1195	112	0	0	191	0	159								
V/C Ratio(X)	0.19	0.00	0.41	0.01	0.50	0.04	0.18	0.00	0.00	0.35	0.00	0.70								
Avail Cap(c_a), veh/h	679	0	1374	701	1400	1195	279	0	0	351	0	350								
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(l)	0.76	0.00	0.76	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	1.00								
Uniform Delay (d), s/veh	2.4	0.0	0.0	0.0	0.0	0.0	45.9	0.0	0.0	47.4	0.0	48.4								
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.1	0.1	0.8	0.0	0.0	1.1	0.0	5.4								
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(95%),veh/ln	0.7	0.0	0.5	0.0	0.8	0.0	1.0	0.0	0.0	3.3	0.0	5.8								
Unsig. Movement Delay, s/veh																				
LnGrp Delay(d),s/veh	2.5	0.0	0.7	0.0	1.1	0.1	46.7	0.0	0.0	48.5	0.0	53.8								
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D								
Approach Vol, veh/h	686		751				20		178											
Approach Delay, s/veh	1.0		1.1				46.7		51.8											
Approach LOS	A		A				D		D											
Timer - Assigned Phs	1	2	4		6		8													
Phs Duration (G+Y+Rc), s	9.8	85.0	15.2		94.8		15.2													
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6													
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4													
Max Q Clear Time (g_c+I1), s	4.3	2.5	9.2		2.5		9.3													
Green Ext Time (p_c), s	0.1	0.9	0.5		0.7		0.0													
Intersection Summary																				
HCM 6th Ctrl Delay	7.1																			
HCM 6th LOS	A																			

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	497	24	21	531	13	67	24	18	16	21	76
Future Volume (vph)	55	497	24	21	531	13	67	24	18	16	21	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1744	0	1620	1698	0	1541	1658	0	0	1823	0
Flt Permitted	0.417			0.431			0.529				0.950	
Satd. Flow (perm)	725	1744	0	735	1698	0	858	1658	0	0	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			19			80	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	548	0	22	573	0	71	44	0	0	119	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.5	86.5		86.5	86.5		13.6	13.6			13.6	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.10	0.40		0.04	0.43		0.67	0.20			0.42	
Control Delay	5.4	6.6		3.7	5.5		74.1	28.7			20.7	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0			0.0	
Total Delay	5.4	6.7		3.7	5.5		74.1	28.7			20.7	
LOS	A	A		A	A		E	C			C	
Approach Delay		6.6			5.4			56.7			20.7	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	11	153		3	105		49	16			25	
Queue Length 95th (ft)	29	203		11	205		94	47			75	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	569	1371		577	1335		319	629			700	
Starvation Cap Reductn	0	192		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	14		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.10	0.46		0.04	0.43		0.22	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.3

Intersection LOS: B

Intersection Capacity Utilization 68.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2028 No Build
SAT Peak Hour

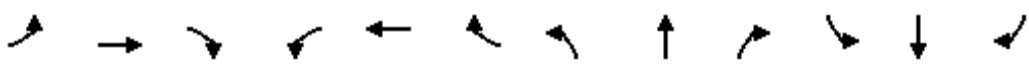
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	497	24	21	531	13	67	24	18	16	21	76
Future Volume (veh/h)	55	497	24	21	531	13	67	24	18	16	21	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	58	523	20	22	559	13	71	25	7	17	22	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	654	1382	53	800	1549	36	172	102	29	63	52	63
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	773	1661	64	882	1861	43	1242	1315	368	287	676	815
Grp Volume(v), veh/h	58	0	543	22	0	572	71	0	32	72	0	0
Grp Sat Flow(s),veh/h/ln	773	0	1724	882	0	1904	1242	0	1683	1778	0	0
Q Serve(g_s), s	0.8	0.0	0.0	0.5	0.0	7.9	1.0	0.0	2.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	8.7	0.0	0.0	0.5	0.0	7.9	5.2	0.0	2.0	4.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	1.00		0.22	0.24		0.46
Lane Grp Cap(c), veh/h	654	0	1435	800	0	1585	172	0	131	162	0	0
V/C Ratio(X)	0.09	0.00	0.38	0.03	0.00	0.36	0.41	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	654	0	1435	800	0	1585	538	0	627	675	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)	0.91	0.00	0.91	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	1.6	0.0	2.2	49.1	0.0	47.8	49.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.1	0.0	0.6	1.6	0.0	1.0	1.9	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	3.1	3.5	0.0	1.5	3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.0	0.7	1.6	0.0	2.9	50.7	0.0	48.8	50.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	601		594				103				72	
Approach Delay, s/veh	0.7		2.8				50.1				50.9	
Approach LOS	A		A				D				D	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	96.5		13.5		96.5		13.5					
Change Period (Y+Rc), s	* 5.9		6.0		* 5.9		6.0					
Max Green Setting (Gmax), s	* 58		40.0		* 58		40.0					
Max Q Clear Time (g_c+I1), s	2.0		6.2		9.9		7.2					
Green Ext Time (p_c), s	19.8		0.2		20.8		0.3					
Intersection Summary												
HCM 6th Ctrl Delay	8.0											
HCM 6th LOS	A											
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	344	1	60	209	115	0	0	130	28
Future Volume (vph)	0	0	0	344	1	60	209	115	0	0	130	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1642	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.953		0.496					
Satd. Flow (perm)	0	0	0	0	1642	1442	822	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	359	63	218	120	0	0	135	29
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.7	16.7	27.3	27.3			14.2	14.2
Actuated g/C Ratio					0.31	0.31	0.51	0.51			0.26	0.26
v/c Ratio					0.70	0.11	0.41	0.14			0.29	0.05
Control Delay					24.7	0.4	10.9	8.5			18.7	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					24.7	0.4	10.9	8.5			18.7	0.2
LOS					C	A	B	A			B	A
Approach Delay					21.1			10.1			15.4	
Approach LOS					C			B			B	
Queue Length 50th (ft)					95	0	37	19			35	0
Queue Length 95th (ft)					187	0	79	45			77	0
Internal Link Dist (ft)		920			920			470			916	

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					633	657	532	926			556	610
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					0.57	0.10	0.41	0.13			0.24	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 53.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 16.0

Intersection LOS: B

Intersection Capacity Utilization 55.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	344	1	60	209	115	0	0	130	28
Future Volume (veh/h)	0	0	0	344	1	60	209	115	0	0	130	28
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				358	1	0	218	120	0	0	135	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				481	1		655	909	0	0	502	
Arrive On Green				0.25	0.27	0.00	0.16	0.53	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1781	5	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				359	0	0	218	120	0	0	135	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				8.9	0.0	0.0	3.9	1.7	0.0	0.0	2.7	0.0
Cycle Q Clear(g_c), s				8.9	0.0	0.0	3.9	1.7	0.0	0.0	2.7	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				483	0		655	909	0	0	502	
V/C Ratio(X)				0.74	0.00		0.33	0.13	0.00	0.00	0.27	
Avail Cap(c_a), veh/h				760	0		668	1064	0	0	657	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.5	0.0	0.0	8.1	5.7	0.0	0.0	13.8	0.0
Incr Delay (d2), s/veh				2.3	0.0	0.0	0.3	0.2	0.0	0.0	1.0	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
%ile BackOfQ(95%),veh/ln				6.5	0.0	0.0	1.8	0.8	0.0	0.0	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.8	0.0	0.0	8.4	5.9	0.0	0.0	14.9	0.0
LnGrp LOS				B	A		A	A	A	A	B	
Approach Vol, veh/h					359			338			135	
Approach Delay, s/veh					18.8			7.5			14.9	
Approach LOS					B			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		30.6			12.6	18.0		17.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		3.7			5.9	4.7		10.9				
Green Ext Time (p_c), s		2.3			0.1	1.5		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.6								
HCM 6th LOS				B								

Notes

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

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	212	0	0	0	0	292	352	88	388	0
Future Volume (vph)	24	0	212	0	0	0	0	292	352	88	388	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	228	0	0	0	0	692	0	95	417	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 55.1% ICU Level of Service B

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2028 No Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	24	0	212	0	0	0	0	292	352	88	388	0
Future Vol, veh/h	24	0	212	0	0	0	0	292	352	88	388	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	26	0	228	0	0	0	0	314	378	95	417	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	921	921	417	-	0	0	314	0	0
Stage 1	607	607	-	-	-	-	-	-	-
Stage 2	314	314	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	311	318	696	0	-	-	971	-	0
Stage 1	649	542	-	0	-	-	-	-	0
Stage 2	862	695	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	281	0	696	-	-	-	971	-	-
Mov Cap-2 Maneuver	281	0	-	-	-	-	-	-	-
Stage 1	649	0	-	-	-	-	-	-	-
Stage 2	778	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	281	696	971	-
HCM Lane V/C Ratio	-	-	0.092	0.328	0.097	-
HCM Control Delay (s)	-	-	19.1	12.7	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	1.4	0.3	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 No Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	13	618	616	3
Future Volume (vph)	6	11	13	618	616	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1796	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1796	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	671	658	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	53.0%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 No Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	13	618	616	3
Future Vol, veh/h	6	11	13	618	616	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	14	657	655	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1342	657	658	0	-	0
Stage 1	657	-	-	-	-	-
Stage 2	685	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	166	490	764	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	161	490	764	-	-	-
Mov Cap-2 Maneuver	161	-	-	-	-	-
Stage 1	521	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.5	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	764	-	285	-	-
HCM Lane V/C Ratio	0.018	-	0.063	-	-
HCM Control Delay (s)	9.8	0	18.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	24	54	11	22	33	30	456	8	20	434	183
Future Volume (vph)	154	24	54	11	22	33	30	456	8	20	434	183
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1685	0	1572	1636	0	1620	1712	0	1550	1683	0
Flt Permitted	0.719			0.704			0.342			0.452		
Satd. Flow (perm)	1226	1685	0	1165	1636	0	583	1712	0	738	1683	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			35			2			60	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	82	0	12	58	0	32	488	0	21	650	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.8	12.8		12.5	12.5		40.4	40.4		40.4	40.4	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.67	0.67		0.67	0.67	
v/c Ratio	0.62	0.20		0.05	0.16		0.08	0.42		0.04	0.56	
Control Delay	31.8	9.8		17.9	11.1		5.5	8.0		5.9	9.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.8	9.8		17.9	11.1		5.5	8.0		5.9	9.2	
LOS	C	A		B	B		A	A		A	A	
Approach Delay		24.4			12.2			7.9			9.1	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)	52	7		3	7		4	88		3	120	
Queue Length 95th (ft)	104	35		14	30		m15	203		11	227	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	464		291	435		393	1154		497	1154	
Starvation Cap Reductn	0	0		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	0.53	0.18		0.04	0.13		0.08	0.42		0.04	0.56	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 11.3

Intersection LOS: B

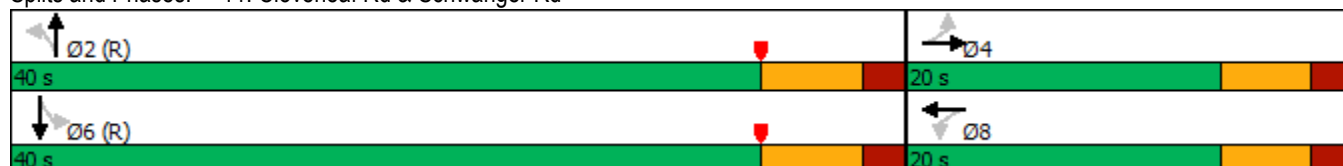
Intersection Capacity Utilization 60.3%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary 11: Cloverleaf Rd & Schwanger Rd

2028 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	24	54	11	22	33	30	456	8	20	434	183
Future Volume (veh/h)	154	24	54	11	22	33	30	456	8	20	434	183
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	162	25	30	12	23	21	32	480	7	21	457	159
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	349	155	186	318	159	145	502	1182	17	502	882	307
Arrive On Green	0.18	0.18	0.16	0.18	0.18	0.16	0.21	0.21	0.21	0.64	0.64	0.63
Sat Flow, veh/h	1436	855	1026	1262	876	800	825	1837	27	913	1372	477
Grp Volume(v), veh/h	162	0	55	12	0	44	32	0	487	21	0	616
Grp Sat Flow(s),veh/h/ln	1436	0	1881	1262	0	1676	825	0	1864	913	0	1849
Q Serve(g_s), s	6.4	0.0	1.5	0.5	0.0	1.3	2.0	0.0	13.5	0.8	0.0	10.8
Cycle Q Clear(g_c), s	7.7	0.0	1.5	2.0	0.0	1.3	12.8	0.0	13.5	14.3	0.0	10.8
Prop In Lane	1.00		0.55	1.00		0.48	1.00		0.01	1.00		0.26
Lane Grp Cap(c), veh/h	349	0	342	318	0	304	502	0	1199	502	0	1190
V/C Ratio(X)	0.46	0.00	0.16	0.04	0.00	0.14	0.06	0.00	0.41	0.04	0.00	0.52
Avail Cap(c_a), veh/h	447	0	470	404	0	419	502	0	1199	502	0	1190
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.94	0.00	0.94	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	20.9	21.5	0.0	20.8	18.1	0.0	13.8	10.4	0.0	5.8
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0	1.0	0.2	0.0	1.6
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(95%),veh/ln	3.7	0.0	1.1	0.2	0.0	0.9	0.8	0.0	10.9	0.3	0.0	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	0.0	21.2	21.6	0.0	21.1	18.3	0.0	14.7	10.6	0.0	7.4
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	A
Approach Vol, veh/h	217		56				519				637	
Approach Delay, s/veh	23.9		21.2				14.9				7.5	
Approach LOS	C		C				B				A	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	44.1		15.9		44.1		15.9					
Change Period (Y+Rc), s	6.5		6.0		6.5		6.0					
Max Green Setting (Gmax), s	33.5		14.0		33.5		14.0					
Max Q Clear Time (g_c+I1), s	15.5		9.7		12.8		4.0					
Green Ext Time (p_c), s	9.4		0.3		13.3		0.1					
Intersection Summary												
HCM 6th Ctrl Delay	13.2											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	24	0	7	16	485	7	11	505	7
Future Volume (vph)	5	1	12	24	0	7	16	485	7	11	505	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1696	0	0	1668	0	0	1722	1648
Flt Permitted					0.990			0.981			0.988	
Satd. Flow (perm)	0	1740	1581	0	1746	0	0	1640	0	0	1703	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	32	0	0	535	0	0	544	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.13			0.37			0.36	0.00
Control Delay		23.5	0.4		5.2			2.9			1.5	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.4		5.2			2.9			1.5	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.7			5.2			2.9			1.5	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		13			108			13	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		379			1454			1509	1466
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		0.02	0.04		0.08			0.37			0.36	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 2.4

Intersection LOS: A

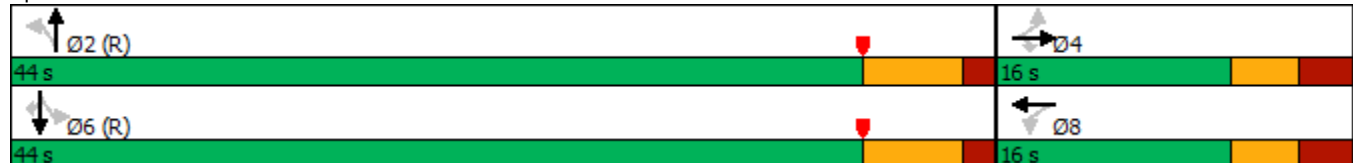
Intersection Capacity Utilization 57.5%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	24	0	7	16	485	7	11	505	7
Future Volume (veh/h)	5	1	12	24	0	7	16	485	7	11	505	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	25	0	3	17	511	7	12	532	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	172	12	70	163	0	6	77	1330	18	70	1453	1318
Arrive On Green	0.03	0.04	0.04	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1397	279	1586	1119	0	134	19	1667	22	11	1822	1652
Grp Volume(v), veh/h	6	0	6	28	0	0	535	0	0	544	0	7
Grp Sat Flow(s),veh/h/ln	1676	0	1586	1253	0	0	1709	0	0	1833	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	1.4	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.89		0.11	0.03		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	156	0	70	148	0	0	1396	0	0	1493	0	1318
V/C Ratio(X)	0.04	0.00	0.09	0.19	0.00	0.00	0.38	0.00	0.00	0.36	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1396	0	0	1493	0	1318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.81	0.00	0.81
Uniform Delay (d), s/veh	27.9	0.0	27.5	28.7	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.5	0.6	0.0	0.0	0.8	0.0	0.0	0.6	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(95%),veh/ln	0.2	0.0	0.2	0.8	0.0	0.0	1.0	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	28.0	29.3	0.0	0.0	2.6	0.0	0.0	0.6	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	12			28			535			551		
Approach Delay, s/veh	28.0			29.3			2.6			0.6		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	52.9			7.1			52.9			7.1		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	7.5			2.2			2.0			3.4		
Green Ext Time (p_c), s	14.5			0.0			16.3			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	2.5											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	294	56	27	316	138	72	167	15	129	176	183
Future Volume (vph)	206	294	56	27	316	138	72	167	15	129	176	183
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1845	0	1558	1624	1499
Flt Permitted	0.283			0.577			0.644			0.627		
Satd. Flow (perm)	468	1809	1435	927	1731	1592	1177	1845	0	1028	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		6				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	210	300	57	28	322	141	73	185	0	132	180	187
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	30.4	30.4	30.4	16.4	16.4	16.4	19.1	13.2		19.3	13.3	13.3
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.29	0.20		0.29	0.20	0.20
v/c Ratio	0.59	0.36	0.08	0.12	0.75	0.24	0.18	0.49		0.36	0.55	0.37
Control Delay	22.1	15.0	0.2	23.2	37.4	1.0	14.7	28.9		17.3	32.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	22.1	15.0	0.2	23.2	37.4	1.0	14.7	28.9		17.3	32.0	3.7
LOS	C	B	A	C	D	A	B	C		B	C	A
Approach Delay		16.2			26.1			24.9			17.5	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	56	84	0	9	129	0	19	70		37	71	0
Queue Length 95th (ft)	#122	153	0	30	#257	0	44	128		73	132	23
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	354	907	799	268	501	642	412	510		367	445	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.59	0.33	0.07	0.10	0.64	0.22	0.18	0.36		0.36	0.40	0.32

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 65.9

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 20.5

Intersection LOS: C

Intersection Capacity Utilization 66.6%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	294	56	27	316	138	72	167	15	129	176	183
Future Volume (veh/h)	206	294	56	27	316	138	72	167	15	129	176	183
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	210	300	51	28	322	0	73	170	12	132	180	105
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	412	835	707	339	410		368	278	20	373	304	269
Arrive On Green	0.13	0.45	0.45	0.23	0.23	0.00	0.07	0.14	0.12	0.11	0.19	0.19
Sat Flow, veh/h	1723	1837	1557	957	1794	1557	2069	2018	142	1576	1641	1450
Grp Volume(v), veh/h	210	300	51	28	322	0	73	0	182	132	180	105
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	957	1794	1557	2069	0	2160	1576	1641	1450
Q Serve(g_s), s	4.9	6.4	1.1	1.4	10.1	0.0	1.7	0.0	4.7	4.1	6.0	3.8
Cycle Q Clear(g_c), s	4.9	6.4	1.1	1.4	10.1	0.0	1.7	0.0	4.7	4.1	6.0	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	412	835	707	339	410		368	0	297	373	304	269
V/C Ratio(X)	0.51	0.36	0.07	0.08	0.79		0.20	0.00	0.61	0.35	0.59	0.39
Avail Cap(c_a), veh/h	412	985	834	417	556		506	0	633	403	481	425
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.7	10.6	9.2	18.3	21.7	0.0	19.7	0.0	24.3	18.4	22.2	21.4
Incr Delay (d2), s/veh	1.0	0.1	0.0	0.0	3.5	0.0	0.3	0.0	2.0	0.6	1.8	0.9
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(95%),veh/ln	2.9	3.6	0.5	0.5	7.2	0.0	1.5	0.0	4.5	2.4	4.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	10.7	9.2	18.4	25.2	0.0	19.9	0.0	26.3	18.9	24.1	22.3
LnGrp LOS	B	B	A	B	C		B	A	C	B	C	C
Approach Vol, veh/h	561				350				255			
Approach Delay, s/veh	12.1				24.6				24.5			
Approach LOS	B				C				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	19.1	12.9	14.2		32.6	10.0	17.1				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	7.4	12.6	6.6	6.7		8.9	4.2	8.5				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.5		0.1	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Notes

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

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2028 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	50	33	16	33	48	20	178	7	25	181	34
Future Volume (vph)	38	50	33	16	33	48	20	178	7	25	181	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1681	0	0	1633	0	0	1772	0	0	1850	0
Flt Permitted		0.984			0.992			0.995			0.995	
Satd. Flow (perm)	0	1681	0	0	1633	0	0	1772	0	0	1850	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	126	0	0	101	0	0	213	0	0	250	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.1%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

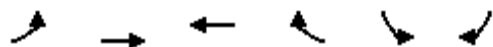
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	38	50	33	16	33	48	20	178	7	25	181	34
Future Vol, veh/h	38	50	33	16	33	48	20	178	7	25	181	34
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	40	52	34	17	34	50	21	185	7	26	189	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	8.8	9.9	10
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	31%	16%	10%
Vol Thru, %	87%	41%	34%	75%
Vol Right, %	3%	27%	49%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	205	121	97	240
LT Vol	20	38	16	25
Through Vol	178	50	33	181
RT Vol	7	33	48	34
Lane Flow Rate	214	126	101	250
Geometry Grp	1	1	1	1
Degree of Util (X)	0.288	0.181	0.138	0.324
Departure Headway (Hd)	4.849	5.159	4.904	4.666
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	737	689	724	765
Service Time	2.915	3.235	2.983	2.73
HCM Lane V/C Ratio	0.29	0.183	0.14	0.327
HCM Control Delay	9.9	9.4	8.8	10
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.7	0.5	1.4

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2028 No Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	396	431	34	32	3
Future Volume (vph)	3	396	431	34	32	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1793	0	1660	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1793	0	1660	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	413	484	0	36	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.7% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	396	431	34	32	3
Future Vol, veh/h	3	396	431	34	32	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	413	449	35	33	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	484	0	-	0	886	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	419	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	840	-	-	-	318	615
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	724	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	840	-	-	-	317	615
Mov Cap-2 Maneuver	-	-	-	-	464	-
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	724	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.2		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	840	-	-	-	474	
HCM Lane V/C Ratio	0.004	-	-	-	0.077	
HCM Control Delay (s)	9.3	-	-	-	13.2	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

APPENDIX L15

2028 BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	475	80	105	442	145	160
Future Volume (vph)	475	80	105	442	145	160
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1687	0	1662	1766	1530	0
Flt Permitted			0.186		0.977	
Satd. Flow (perm)	1687	0	325	1766	1530	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	15					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	617	0	117	491	339	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	31.3		42.1	40.9	18.7	
Actuated g/C Ratio	0.45		0.60	0.58	0.27	
v/c Ratio	0.81		0.34	0.48	0.83	
Control Delay	28.7		6.7	7.3	44.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	28.7		6.7	7.3	44.1	
LOS	C		A	A	D	
Approach Delay	28.7			7.2	44.1	
Approach LOS	C			A	D	
Queue Length 50th (ft)	231		15	68	137	
Queue Length 95th (ft)	#428		28	97	#270	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	762		348	1032	410	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.81		0.34	0.48	0.83	

Intersection Summary

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 23.7	Intersection LOS: C
Intersection Capacity Utilization 68.6%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: Maytown Rd & SR 0230

↙ Ø1	→ Ø2 (R)	↖ Ø4
12 s	34 s	24 s
↘ Ø6 (R)		
46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2028 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	👉		👈	👈	👉	
Traffic Volume (veh/h)	475	80	105	442	145	160
Future Volume (veh/h)	475	80	105	442	145	160
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	528	83	117	491	161	178
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	647	102	364	1159	192	212
Arrive On Green	0.47	0.45	0.16	1.00	0.25	0.24
Sat Flow, veh/h	1390	218	1846	1927	768	849
Grp Volume(v), veh/h	0	611	117	491	340	0
Grp Sat Flow(s),veh/h/ln	0	1608	1846	1927	1622	0
Q Serve(g_s), s	0.0	22.9	2.0	0.0	13.9	0.0
Cycle Q Clear(g_c), s	0.0	22.9	2.0	0.0	13.9	0.0
Prop In Lane		0.14	1.00		0.47	0.52
Lane Grp Cap(c), veh/h	0	749	364	1159	406	0
V/C Ratio(X)	0.00	0.82	0.32	0.42	0.84	0.00
Avail Cap(c_a), veh/h	0	749	430	1159	436	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	16.2	10.9	0.0	25.2	0.0
Incr Delay (d2), s/veh	0.0	9.5	0.5	1.1	16.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	14.2	1.1	0.7	11.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	25.7	11.4	1.1	42.1	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	611			608	340	
Approach Delay, s/veh	25.7			3.1	42.1	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.5	37.8		22.7		47.3
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	4.0	24.9		15.9		2.0
Green Ext Time (p_c), s	0.1	2.1		0.6		13.3
Intersection Summary						
HCM 6th Ctrl Delay			20.5			
HCM 6th LOS			C			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	646	1	0	589	52	0	0	2	64	0	88
Future Volume (vph)	44	646	1	0	589	52	0	0	2	64	0	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1614	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1614	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	727	0	0	720	0	0	2	0	72	99	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 53.5%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	646	1	0	589	52	0	0	2	64	0	88
Future Vol, veh/h	44	646	1	0	589	52	0	0	2	64	0	88
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	49	726	1	0	662	58	0	0	2	72	0	99

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	720	0	0	727	0	0	1567	1545	728	1518	1516	692
Stage 1	-	-	-	-	-	-	825	825	-	691	691	-
Stage 2	-	-	-	-	-	-	742	720	-	827	825	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	714	-	-	527	-	-	116	137	378	136	155	441
Stage 1	-	-	-	-	-	-	449	427	-	549	503	-
Stage 2	-	-	-	-	-	-	497	471	-	469	447	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	714	-	-	527	-	-	85	128	378	128	144	441
Mov Cap-2 Maneuver	-	-	-	-	-	-	85	128	-	128	144	-
Stage 1	-	-	-	-	-	-	418	398	-	511	503	-
Stage 2	-	-	-	-	-	-	385	471	-	434	416	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	14.6	36
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	378	714	-	-	527	-	-	128	441
HCM Lane V/C Ratio	0.006	0.069	-	-	-	-	-	0.562	0.224
HCM Control Delay (s)	14.6	10.4	-	-	0	-	-	64.3	15.5
HCM Lane LOS	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	2.8	0.8

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	579	45	63	530	6	104	2	73	4	3	2
Future Volume (vph)	3	579	45	63	530	6	104	2	73	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.442			0.265			0.754			0.703		
Satd. Flow (perm)	769	1667	1552	430	1558	1608	1302	1516	0	1303	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45		81			2	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	643	50	70	589	7	116	83	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	42.2	42.2	42.2	52.2	52.1	52.1	10.8	10.8		10.7	10.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.75	0.74	0.74	0.15	0.15		0.15	0.15	
v/c Ratio	0.01	0.64	0.05	0.16	0.51	0.01	0.58	0.27		0.02	0.02	
Control Delay	6.7	10.8	0.1	1.7	3.4	0.0	39.1	9.7		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	10.8	0.1	1.7	3.4	0.0	39.1	9.7		24.5	21.0	
LOS	A	B	A	A	A	A	D	A		C	C	
Approach Delay		10.0			3.2			26.8			22.6	
Approach LOS		B			A			C			C	
Queue Length 50th (ft)	1	99	0	7	69	0	46	1		1	1	
Queue Length 95th (ft)	m1	m129	m0	1	12	m0	95	35		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	464	1005	988	455	1159	1208	225	329		225	320	
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	0.01	0.64	0.05	0.15	0.51	0.01	0.52	0.25		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 9.3

Intersection LOS: A

Intersection Capacity Utilization 68.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	579	45	63	530	6	104	2	73	4	3	2
Future Volume (veh/h)	3	579	45	63	530	6	104	2	73	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	643	34	70	589	6	116	2	43	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	654	1184	1047	614	1165	1116	283	9	199	259	145	97
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.12	0.12	0.11	0.12	0.12	0.11
Sat Flow, veh/h	906	1947	1722	1640	1609	1542	1461	75	1612	1467	1176	784
Grp Volume(v), veh/h	3	643	34	70	589	6	116	0	45	4	0	5
Grp Sat Flow(s),veh/h/ln	906	1947	1722	1640	1609	1542	1461	0	1687	1467	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	5.3	0.0	1.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.9	0.0	0.0	5.3	0.0	1.7	1.4	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	654	1184	1047	614	1165	1116	283	0	208	259	0	242
V/C Ratio(X)	0.00	0.54	0.03	0.11	0.51	0.01	0.41	0.00	0.22	0.02	0.00	0.02
Avail Cap(c_a), veh/h	654	1184	1047	729	1165	1116	355	0	292	331	0	339
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)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.3	0.0	0.0	29.2	0.0	28.1	28.0	0.0	27.1
Incr Delay (d2), s/veh	0.0	1.8	0.1	0.1	1.4	0.0	0.9	0.0	0.5	0.0	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(95%),veh/ln	0.0	1.1	0.0	0.3	0.8	0.0	3.4	0.0	1.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.8	0.1	3.3	1.4	0.0	30.2	0.0	28.6	28.1	0.0	27.2
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	680			665			161			9		
Approach Delay, s/veh	1.7			1.6			29.7			27.6		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.1	48.4	13.5		56.5		13.5					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.4	2.5	3.9		2.5		7.8					
Green Ext Time (p_c), s	0.0	0.8	0.0		0.7		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.8
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	504	13	5	566	12	9	0	15	6	0	8
Future Volume (vph)	26	504	13	5	566	12	9	0	15	6	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1660	0	1744	1654	1445	0	1727	0	1719	1501	0
Flt Permitted	0.352			0.456				0.870				
Satd. Flow (perm)	621	1660	0	837	1654	1415	0	1530	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				126		139			370	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	556	0	5	609	13	0	26	0	6	9	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.37		0.01	0.44	0.01		0.09		0.03	0.02	
Control Delay	0.8	2.9		3.6	5.1	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.8	2.9		3.6	5.1	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.8			4.9			0.7			11.5	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	111		m1	125	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	635	1493		700	1383	1204		325		242	521	
Starvation Cap Reductn	0	0		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	0.04	0.37		0.01	0.44	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 3.9

Intersection LOS: A

Intersection Capacity Utilization 47.9%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2028 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	504	13	5	566	12	9	0	15	6	0	8
Future Volume (veh/h)	26	504	13	5	566	12	9	0	15	6	0	8
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	0.98		0.99	0.99		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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	28	542	14	5	609	13	10	0	15	6	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	685	1293	33	745	1295	1123	88	0	24	161	70	0
Arrive On Green	0.06	1.00	1.00	1.00	1.00	1.00	0.02	0.00	0.02	0.04	0.00	0.00
Sat Flow, veh/h	1629	1578	41	888	1793	1554	418	0	626	1360	1837	0
Grp Volume(v), veh/h	28	0	556	5	609	13	25	0	0	6	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	1619	888	1793	1554	1044	0	0	1360	1837	0
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.40		0.60	1.00		0.00
Lane Grp Cap(c), veh/h	685	0	1326	745	1295	1123	97	0	0	161	70	0
V/C Ratio(X)	0.04	0.00	0.42	0.01	0.47	0.01	0.26	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	784	0	1326	745	1295	1123	241	0	0	292	247	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(l)	0.73	0.00	0.73	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	33.9	0.0	0.0	32.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.0	1.1	0.0	1.4	0.0	0.0	0.1	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(95%),veh/ln	0.0	0.0	0.5	0.0	0.7	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.7	0.0	1.1	0.0	35.3	0.0	0.0	32.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	A
Approach Vol, veh/h	584			627			25			6		
Approach Delay, s/veh	0.8			1.1			35.3			32.6		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.8	56.0	7.3		62.7		7.3					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.8	2.5	2.7		2.5		3.7					
Green Ext Time (p_c), s	0.0	0.8	0.0		0.7		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	1.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	469	5	10	463	35	61	31	36	59	26	51
Future Volume (vph)	39	469	5	10	463	35	61	31	36	59	26	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1672	0	1246	1587	0	1248	1509	0	0	1835	0
Flt Permitted	0.429			0.446			0.647				0.827	
Satd. Flow (perm)	761	1672	0	585	1587	0	850	1509	0	0	1549	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			9			39			44	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	509	0	11	536	0	66	72	0	0	146	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	51.7	51.7		51.7	51.7		11.7	11.7			11.7	
Actuated g/C Ratio	0.74	0.74		0.74	0.74		0.17	0.17			0.17	
v/c Ratio	0.07	0.41		0.03	0.46		0.47	0.25			0.50	
Control Delay	1.1	1.6		5.0	7.1		35.9	15.2			23.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.6		5.0	7.1		35.9	15.2			23.4	
LOS	A	A		A	A		D	B			C	
Approach Delay		1.6			7.0			25.1			23.4	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	1	8		1	85		26	12			40	
Queue Length 95th (ft)	3	18		7	194		57	41			82	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	562	1235		432	1175		242	459			474	
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	0.07	0.41		0.03	0.46		0.27	0.16			0.31	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 8.4

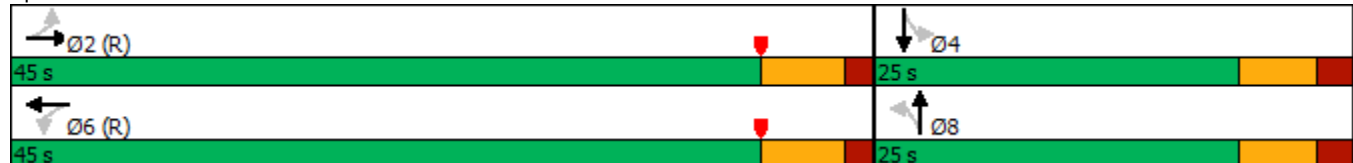
Intersection LOS: A

Intersection Capacity Utilization 57.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2028 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	469	5	10	463	35	61	31	36	59	26	51
Future Volume (veh/h)	39	469	5	10	463	35	61	31	36	59	26	51
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	42	504	4	11	498	37	66	33	17	63	28	37
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	601	1210	10	618	1221	91	234	138	71	157	59	57
Arrive On Green	1.00	1.00	1.00	0.73	0.73	0.71	0.13	0.13	0.12	0.12	0.13	0.12
Sat Flow, veh/h	813	1664	13	708	1679	125	987	1052	542	609	452	431
Grp Volume(v), veh/h	42	0	508	11	0	535	66	0	50	128	0	0
Grp Sat Flow(s),veh/h/ln	813	0	1677	708	0	1804	987	0	1593	1492	0	0
Q Serve(g_s), s	0.6	0.0	0.0	0.3	0.0	8.1	0.0	0.0	2.0	4.0	0.0	0.0
Cycle Q Clear(g_c), s	8.7	0.0	0.0	0.3	0.0	8.1	4.3	0.0	2.0	6.0	0.0	0.0
Prop In Lane	1.00		0.01	1.00		0.07	1.00		0.34	0.49		0.29
Lane Grp Cap(c), veh/h	601	0	1220	618	0	1312	234	0	209	251	0	0
V/C Ratio(X)	0.07	0.00	0.42	0.02	0.00	0.41	0.28	0.00	0.24	0.51	0.00	0.00
Avail Cap(c_a), veh/h	601	0	1220	618	0	1312	386	0	455	503	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(l)	0.94	0.00	0.94	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.7	0.0	0.0	2.6	0.0	3.7	28.3	0.0	27.4	29.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.0	0.1	0.0	0.9	0.7	0.0	0.6	1.6	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(95%),veh/ln	0.1	0.0	0.6	0.1	0.0	3.3	1.8	0.0	1.4	3.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.9	0.0	1.0	2.7	0.0	4.7	28.9	0.0	28.0	31.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	550			546			116			128		
Approach Delay, s/veh	1.0			4.6			28.5			31.1		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	55.8			14.2			55.8			14.2		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			8.0			10.1			6.3		
Green Ext Time (p_c), s	15.4			0.3			14.6			0.3		

Intersection Summary

HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	420	0	89	600	168	0	0	218	57
Future Volume (vph)	0	0	0	420	0	89	600	168	0	0	218	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.433					
Satd. Flow (perm)	0	0	0	0	1546	1145	704	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	438	93	625	175	0	0	227	59
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.5	16.5	32.8	32.8			15.8	15.8
Actuated g/C Ratio					0.28	0.28	0.56	0.56			0.27	0.27
v/c Ratio					1.01	0.21	1.11	0.22			0.56	0.11
Control Delay					72.0	2.0	87.6	7.4			24.3	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					72.0	2.0	87.6	7.4			24.3	0.4
LOS					E	A	F	A			C	A
Approach Delay					59.7			70.1			19.4	
Approach LOS					E			E			B	
Queue Length 50th (ft)					~166	0	~177	28			69	0
Queue Length 95th (ft)					#329	8	#441	55			129	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2028 Build

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					434	439	563	823			441	550
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					1.01	0.21	1.11	0.21			0.51	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 57.7

Intersection LOS: E

Intersection Capacity Utilization 98.7%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	420	0	89	600	168	0	0	218	57
Future Volume (veh/h)	0	0	0	420	0	89	600	168	0	0	218	57
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				438	0	0	625	175	0	0	227	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				516	0		596	801	0	0	389	
Arrive On Green				0.27	0.00	0.00	0.22	0.54	0.00	0.00	0.23	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				438	0	0	625	175	0	0	227	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				12.9	0.0	0.0	12.0	3.4	0.0	0.0	6.7	0.0
Cycle Q Clear(g_c), s				12.9	0.0	0.0	12.0	3.4	0.0	0.0	6.7	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				516	0		596	801	0	0	389	
V/C Ratio(X)				0.85	0.00		1.05	0.22	0.00	0.00	0.58	
Avail Cap(c_a), veh/h				530	0		596	908	0	0	508	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.1	0.0	0.0	14.9	6.7	0.0	0.0	18.9	0.0
Incr Delay (d2), s/veh				12.1	0.0	0.0	50.3	0.5	0.0	0.0	5.0	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
%ile BackOfQ(50%),veh/ln				6.7	0.0	0.0	12.7	0.9	0.0	0.0	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.2	0.0	0.0	65.2	7.2	0.0	0.0	23.8	0.0
LnGrp LOS				C	A		F	A	A	A	C	
Approach Vol, veh/h					438			800			227	
Approach Delay, s/veh					31.2			52.5			23.8	
Approach LOS					C			D			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		20.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		5.4			14.0	8.7		14.9				
Green Ext Time (p_c), s		3.8			0.0	2.0		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				41.7								
HCM 6th LOS				D								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2	309	0	0	0	0	735	665	109	522	0
Future Volume (vph)	32	2	309	0	0	0	0	735	665	109	522	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	329	0	0	0	0	1489	0	116	555	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 98.7%												
ICU Level of Service F												
Analysis Period (min) 15												

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2028 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕		↗	↕	
Traffic Vol, veh/h	32	2	309	0	0	0	0	735	665	109	522	0
Future Vol, veh/h	32	2	309	0	0	0	0	735	665	109	522	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	34	2	329	0	0	0	0	782	707	116	555	0
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	1569	1569	555				-	0	0	782	0	0
Stage 1	787	787	-				-	-	-	-	-	-
Stage 2	782	782	-				-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99				-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-				-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-				-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2				-	-	-	3.1	-	-
Pot Cap-1 Maneuver	114	145	566				0	-	-	669	-	0
Stage 1	541	463	-				0	-	-	-	-	0
Stage 2	543	465	-				0	-	-	-	-	0
Platoon blocked, %								-	-	-		
Mov Cap-1 Maneuver	94	0	566				-	-	-	669	-	-
Mov Cap-2 Maneuver	94	0	-				-	-	-	-	-	-
Stage 1	541	0	-				-	-	-	-	-	-
Stage 2	449	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	24.3						0		2			
HCM LOS	C											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	EBLn2	SBL	SBT					
Capacity (veh/h)		-	-	94	566	669	-					
HCM Lane V/C Ratio		-	-	0.385	0.581	0.173	-					
HCM Control Delay (s)		-	-	65.5	19.8	11.5	-					
HCM Lane LOS		-	-	F	C	B	-					
HCM 95th %tile Q(veh)		-	-	1.5	3.7	0.6	-					

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	25	0	1383	822	5
Future Volume (vph)	6	25	0	1383	822	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1622	0	0	1734	1652	0
Flt Permitted	0.990					
Satd. Flow (perm)	1622	0	0	1734	1652	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	1537	919	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	82.8%			ICU Level of Service E		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	25	0	1383	822	5
Future Vol, veh/h	6	25	0	1383	822	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	28	0	1537	913	6

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2453	916	919	0	-	0
Stage 1	916	-	-	-	-	-
Stage 2	1537	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	36	347	635	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	212	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	36	347	635	-	-	-
Mov Cap-2 Maneuver	36	-	-	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	212	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.4	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	635	-	130	-	-
HCM Lane V/C Ratio	-	-	0.265	-	-
HCM Control Delay (s)	0	-	42.4	-	-
HCM Lane LOS	A	-	E	-	-
HCM 95th %tile Q(veh)	0	-	1	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	430	20	131	8	12	76	54	877	8	10	659	191
Future Volume (vph)	430	20	131	8	12	76	54	877	8	10	659	191
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1560	0	1391	1564	0	1500	1616	0	1628	1575	0
Flt Permitted	0.694			0.646			0.101			0.101		
Satd. Flow (perm)	1172	1560	0	945	1564	0	159	1616	0	173	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		146			84			1			34	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	478	168	0	9	97	0	60	983	0	11	944	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.43	0.31		0.03	0.19		0.67	1.08		0.11	1.05	
Control Delay	235.8	6.8		18.6	7.3		43.7	66.5		10.5	60.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	235.8	6.8		18.6	7.3		43.7	66.5		10.5	60.5	
LOS	F	A		B	A		D	E		B	E	
Approach Delay		176.2			8.3			65.2			59.9	
Approach LOS		F			A			E			E	
Queue Length 50th (ft)	~285	7		3	4		8	~489		2	~446	
Queue Length 95th (ft)	#454	48		13	35		m#29	#700		10	#664	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	334	550		270	506		89	912		97	903	
Starvation Cap Reductn	0	0		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	1.43	0.31		0.03	0.19		0.67	1.08		0.11	1.05	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.43

Intersection Signal Delay: 87.3

Intersection LOS: F

Intersection Capacity Utilization 89.8%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

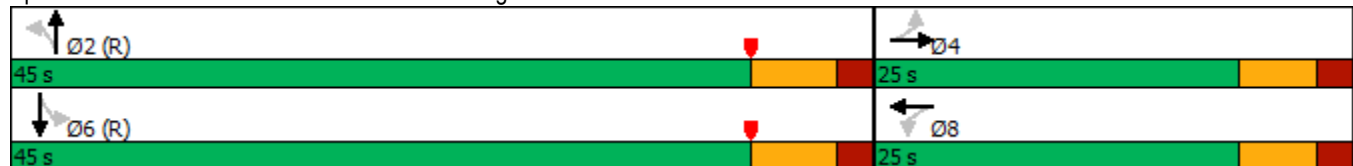
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2028 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	20	131	8	12	76	54	877	8	10	659	191
Future Volume (veh/h)	430	20	131	8	12	76	54	877	8	10	659	191
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	478	22	146	9	13	84	60	974	9	11	732	212
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	421	67	443	317	56	364	129	996	9	439	760	220
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1357	234	1550	1019	197	1274	571	1765	16	597	1347	390
Grp Volume(v), veh/h	478	0	168	9	0	97	60	0	983	11	0	944
Grp Sat Flow(s),veh/h/ln	1357	0	1783	1019	0	1471	571	0	1781	597	0	1737
Q Serve(g_s), s	16.4	0.0	5.3	0.5	0.0	3.6	3.2	0.0	0.0	0.6	0.0	36.3
Cycle Q Clear(g_c), s	20.0	0.0	5.3	5.8	0.0	3.6	39.5	0.0	0.0	0.6	0.0	36.3
Prop In Lane	1.00		0.87	1.00		0.87	1.00		0.01	1.00		0.22
Lane Grp Cap(c), veh/h	421	0	510	317	0	420	129	0	1005	439	0	980
V/C Ratio(X)	1.13	0.00	0.33	0.03	0.00	0.23	0.47	0.00	0.98	0.03	0.00	0.96
Avail Cap(c_a), veh/h	421	0	510	317	0	420	129	0	1005	439	0	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.64	0.00	0.64	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	20.1	22.0	0.0	19.5	19.1	0.0	0.0	6.8	0.0	14.7
Incr Delay (d2), s/veh	86.0	0.0	0.4	0.0	0.0	0.3	7.6	0.0	18.1	0.1	0.0	21.1
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	16.9	0.0	2.1	0.1	0.0	1.2	1.1	0.0	5.0	0.1	0.0	16.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	114.8	0.0	20.5	22.0	0.0	19.7	26.7	0.0	18.1	6.9	0.0	35.8
LnGrp LOS	F	A	C	C	A	B	C	A	B	A	A	D
Approach Vol, veh/h	646			106			1043			955		
Approach Delay, s/veh	90.3			19.9			18.6			35.5		
Approach LOS	F			B			B			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			38.3			7.8		
Green Ext Time (p_c), s	31.0			0.0			0.1			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	41.3											
HCM 6th LOS	D											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	35	2	876	7	63	712	7
Future Volume (vph)	36	0	17	17	1	35	2	876	7	63	712	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1631	0	0	1561	0	0	1617	1648
Flt Permitted		0.962			0.876			0.999			0.877	
Satd. Flow (perm)	0	1674	1581	0	1452	0	0	1560	0	0	1424	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		36			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	55	0	0	922	0	0	808	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.8	8.8		8.6			58.3			58.3	58.3
Actuated g/C Ratio		0.13	0.13		0.12			0.83			0.83	0.83
v/c Ratio		0.18	0.08		0.26			0.71			0.68	0.01
Control Delay		28.5	2.8		17.0			10.2			11.7	0.6
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		28.5	2.8		17.0			10.2			11.7	0.6
LOS		C	A		B			B			B	A
Approach Delay		20.2			17.0			10.2			11.6	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		15	0		7			190			271	0
Queue Length 95th (ft)		39	5		36			#558			m284	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		298	320		288			1299			1186	1379
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		0.13	0.06		0.19			0.71			0.68	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 11.3

Intersection LOS: B

Intersection Capacity Utilization 109.3%

ICU Level of Service H

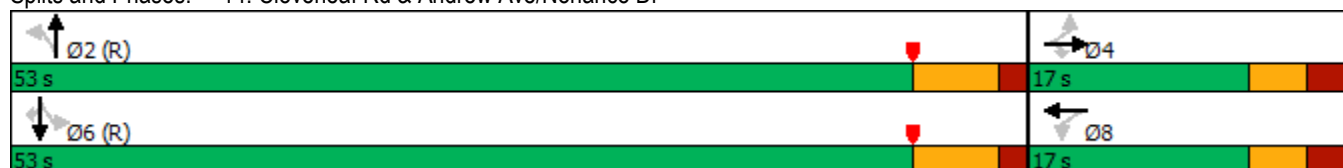
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	35	2	876	7	63	712	7
Future Volume (veh/h)	36	0	17	17	1	35	2	876	7	63	712	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	36	2	912	7	66	742	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	227	0	124	94	10	69	52	1275	10	123	1180	1299
Arrive On Green	0.06	0.00	0.08	0.06	0.08	0.06	0.77	0.79	0.77	1.00	1.00	1.00
Sat Flow, veh/h	1585	0	1586	333	131	879	1	1621	12	85	1501	1652
Grp Volume(v), veh/h	38	0	18	55	0	0	921	0	0	808	0	7
Grp Sat Flow(s),veh/h/ln	1585	0	1586	1344	0	0	1634	0	0	1586	0	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.7	3.0	0.0	0.0	19.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.33		0.65	0.00		0.01	0.08		1.00
Lane Grp Cap(c), veh/h	204	0	124	154	0	0	1313	0	0	1279	0	1299
V/C Ratio(X)	0.19	0.00	0.15	0.36	0.00	0.00	0.70	0.00	0.00	0.63	0.00	0.01
Avail Cap(c_a), veh/h	337	0	283	307	0	0	1313	0	0	1279	0	1299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	30.9	0.0	30.1	31.6	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.4	0.0	0.0	3.1	0.0	0.0	0.2	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	0.6	0.0	0.3	1.0	0.0	0.0	3.5	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	30.6	33.0	0.0	0.0	6.9	0.0	0.0	0.2	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56		55			921			815			
Approach Delay, s/veh	31.1		33.0			6.9			0.2			
Approach LOS	C		C			A			A			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	60.0		10.0			60.0			10.0			
Change Period (Y+Rc), s	6.0		5.5			6.0			5.5			
Max Green Setting (Gmax), s	47.0		11.5			47.0			11.5			
Max Q Clear Time (g_c+I1), s	21.8		3.5			2.0			5.0			
Green Ext Time (p_c), s	21.0		0.1			30.6			0.1			
Intersection Summary												
HCM 6th Ctrl Delay			5.4									
HCM 6th LOS			A									

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	276	55	48	260	212	87	386	46	121	231	189
Future Volume (vph)	305	276	55	48	260	212	87	386	46	121	231	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1689	0	1500	1509	1388
Flt Permitted	0.291			0.580			0.530			0.201		
Satd. Flow (perm)	455	1660	1088	728	1649	1561	914	1689	0	317	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		7				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	324	294	59	51	277	226	93	460	0	129	246	201
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	31.4	31.4	31.4	16.3	16.3	16.3	27.8	21.7		27.8	21.7	21.7
Actuated g/C Ratio	0.42	0.42	0.42	0.22	0.22	0.22	0.37	0.29		0.37	0.29	0.29
v/c Ratio	1.01	0.43	0.11	0.33	0.78	0.43	0.23	0.94		0.54	0.57	0.36
Control Delay	77.6	18.9	0.4	32.7	45.7	6.2	14.8	57.8		22.6	30.7	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	77.6	18.9	0.4	32.7	45.7	6.2	14.8	57.8		22.6	30.7	4.3
LOS	E	B	A	C	D	A	B	E		C	C	A
Approach Delay		45.4			28.4			50.5			19.7	
Approach LOS		D			C			D			B	
Queue Length 50th (ft)	~127	102	0	21	130	0	26	~227		38	107	0
Queue Length 95th (ft)	#314	168	0	54	#242	48	54	#422		72	183	35

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	320	733	564	175	397	557	414	491		243	434	564
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.01	0.40	0.10	0.29	0.70	0.41	0.22	0.94		0.53	0.57	0.36

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 75.5

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 36.3

Intersection LOS: D

Intersection Capacity Utilization 82.9%

ICU Level of Service E

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	276	55	48	260	212	87	386	46	121	231	189
Future Volume (veh/h)	305	276	55	48	260	212	87	386	46	121	231	189
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	324	294	46	51	277	0	93	411	47	129	246	171
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	360	680	480	241	334		409	481	55	295	448	396
Arrive On Green	0.13	0.40	0.40	0.39	0.39	0.00	0.07	0.26	0.25	0.10	0.29	0.29
Sat Flow, veh/h	1641	1709	1206	739	1724	1532	1988	1821	208	1522	1528	1352
Grp Volume(v), veh/h	324	294	46	51	277	0	93	0	458	129	246	171
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	739	1724	1532	1988	0	2029	1522	1528	1352
Q Serve(g_s), s	9.5	9.2	1.8	3.6	10.7	0.0	2.4	0.0	15.8	4.3	10.0	7.5
Cycle Q Clear(g_c), s	9.5	9.2	1.8	3.6	10.7	0.0	2.4	0.0	15.8	4.3	10.0	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	360	680	480	241	334		409	0	536	295	448	396
V/C Ratio(X)	0.90	0.43	0.10	0.21	0.83		0.23	0.00	0.85	0.44	0.55	0.43
Avail Cap(c_a), veh/h	360	767	541	279	422		485	0	593	309	448	396
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	16.1	13.9	19.2	21.4	0.0	17.5	0.0	25.8	18.1	21.9	21.0
Incr Delay (d2), s/veh	24.7	0.2	0.0	0.2	8.6	0.0	0.3	0.0	10.9	1.0	1.4	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	6.3	3.1	0.4	0.5	3.9	0.0	1.1	0.0	9.0	1.4	3.4	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	16.3	13.9	19.4	30.0	0.0	17.8	0.0	36.6	19.2	23.3	21.8
LnGrp LOS	D	B	B	B	C		B	A	D	B	C	C
Approach Vol, veh/h	664			328			551			546		
Approach Delay, s/veh	31.1			28.3			33.5			21.8		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	19.8	13.3	25.4		34.8	11.2	27.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	13.2	6.8	17.8		11.7	4.9	12.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.6		0.1	0.1	1.4				
Intersection Summary												
HCM 6th Ctrl Delay	28.9											
HCM 6th LOS	C											

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	6	0	0	118	10	815	13	126	535	41
Future Volume (vph)	0	0	6	0	0	118	10	815	13	126	535	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Storage Length (ft)	0		0	0		0	75		150	325		175
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1611	0	0	1611	1752	1726	1567	1787	1745	1599
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	0	1611	0	0	1611	1752	1726	1567	1787	1745	1599
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	7	0	0	131	11	906	14	140	594	46
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 56.9%

ICU Level of Service B

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2028 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↖	↗	↗	↖	↗
Traffic Vol, veh/h	0	0	6	0	0	118	10	815	13	126	535	41
Future Vol, veh/h	0	0	6	0	0	118	10	815	13	126	535	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	75	-	150	325	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	9	2	2	10	2
Mvmt Flow	0	0	7	0	0	131	11	906	14	140	594	46

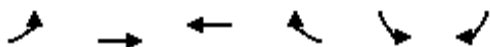
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	594	-	-	906	640	0	0	920	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.7	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.1	-	-	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	532	0	0	350	671	-	-	634	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	532	-	-	350	671	-	-	634	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.9		21.3		0.1		2.2	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	671	-	-	532 350	634	-	-
HCM Lane V/C Ratio	0.017	-	-	0.013 0.375	0.221	-	-
HCM Control Delay (s)	10.5	-	-	11.9 21.3	12.3	-	-
HCM Lane LOS	B	-	-	B C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0 1.7	0.8	-	-

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

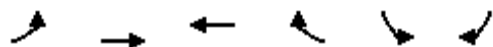
2028 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	337	424	32	50	131
Future Volume (vph)	101	337	424	32	50	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1710	1651	1714	1500	1676	1500
Flt Permitted	0.399				0.950	
Satd. Flow (perm)	718	1651	1714	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				36		146
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2697		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	9%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	374	471	36	56	146
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	22.0	22.0	22.0	22.0	13.0
Total Split (s)	13.0	58.0	45.0	45.0	22.0	13.0
Total Split (%)	16.3%	72.5%	56.3%	56.3%	27.5%	16.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	65.6	67.6	52.7	52.7	9.3	17.3
Actuated g/C Ratio	0.82	0.84	0.66	0.66	0.12	0.22
v/c Ratio	0.16	0.27	0.42	0.04	0.29	0.33
Control Delay	3.0	3.2	9.9	3.2	35.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	3.2	9.9	3.2	35.4	6.0
LOS	A	A	A	A	D	A
Approach Delay		3.2	9.4		14.1	
Approach LOS		A	A		B	
Queue Length 50th (ft)	11	45	119	0	26	0
Queue Length 95th (ft)	26	88	218	12	58	37
Internal Link Dist (ft)		730	2617		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	693	1395	1128	999	356	447

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2028 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.16	0.27	0.42	0.04	0.16	0.33

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 7.7

Intersection LOS: A

Intersection Capacity Utilization 45.3%

ICU Level of Service A

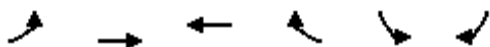
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2028 Build
AM Peak Hour



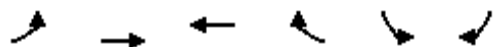
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	337	424	32	50	131
Future Volume (veh/h)	101	337	424	32	50	131
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1800	1674	1730	1772	1772	1772
Adj Flow Rate, veh/h	112	374	471	36	56	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	9	5	2	2	2
Cap, veh/h	606	1249	1081	939	218	281
Arrive On Green	0.06	0.75	0.63	0.63	0.13	0.13
Sat Flow, veh/h	1714	1674	1730	1502	1688	1502
Grp Volume(v), veh/h	112	374	471	36	56	146
Grp Sat Flow(s),veh/h/ln	1714	1674	1730	1502	1688	1502
Q Serve(g_s), s	1.6	5.8	11.2	0.7	2.4	7.0
Cycle Q Clear(g_c), s	1.6	5.8	11.2	0.7	2.4	7.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	606	1249	1081	939	218	281
V/C Ratio(X)	0.18	0.30	0.44	0.04	0.26	0.52
Avail Cap(c_a), veh/h	678	1249	1081	939	359	407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.9	3.3	7.7	5.8	31.4	29.3
Incr Delay (d2), s/veh	0.1	0.6	1.3	0.1	0.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.2	3.5	0.2	1.0	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.0	3.9	9.0	5.8	32.0	30.7
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		486	507		202	
Approach Delay, s/veh		4.2	8.8		31.1	
Approach LOS		A	A		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.7	55.0			64.7	15.3
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	39.0			52.0	16.0
Max Q Clear Time (g_c+I1), s	3.6	13.2			7.8	9.0
Green Ext Time (p_c), s	0.1	1.9			1.4	0.4

Intersection Summary

HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

Lanes, Volumes, Timings
28: SR 0230 & Western Parcels Access

2028 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	18	599	514	22	38	11
Future Volume (vph)	18	599	514	22	38	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12
Grade (%)		1%	-1%		0%	
Storage Length (ft)	500			150	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1702	1661	1725	1591	1740	0
Flt Permitted	0.950				0.963	
Satd. Flow (perm)	1702	1661	1725	1591	1740	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		1000	940		500	
Travel Time (s)		15.2	14.2		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	10%	7%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	666	571	24	54	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 41.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	599	514	22	38	11
Future Vol, veh/h	18	599	514	22	38	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	1	-1	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	10	7	2	2	2
Mvmt Flow	20	666	571	24	42	12
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	595	0	-	0	1277	571
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	706	-
Critical Hdwy	4.5	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	723	-	-	-	175	533
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	548	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	723	-	-	-	170	533
Mov Cap-2 Maneuver	-	-	-	-	343	-
Stage 1	-	-	-	-	620	-
Stage 2	-	-	-	-	548	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		16.3		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	723	-	-	-	373	
HCM Lane V/C Ratio	0.028	-	-	-	0.146	
HCM Control Delay (s)	10.1	-	-	-	16.3	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2028 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	359	457	38	36	3
Future Volume (vph)	3	359	457	38	36	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1718	0	1569	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1318	1693	1718	0	1569	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	395	544	0	43	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 36.4% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	359	457	38	36	3
Future Vol, veh/h	3	359	457	38	36	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	395	502	42	40	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	544	0	-	0	924	523
Stage 1	-	-	-	-	523	-
Stage 2	-	-	-	-	401	-
Critical Hdwy	4.4	-	-	-	6.84	6.7
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	3.3	-	-	-	3	3.4
Pot Cap-1 Maneuver	713	-	-	-	297	507
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	713	-	-	-	296	507
Mov Cap-2 Maneuver	-	-	-	-	444	-
Stage 1	-	-	-	-	631	-
Stage 2	-	-	-	-	737	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.9		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	713	-	-	-	448	
HCM Lane V/C Ratio	0.005	-	-	-	0.096	
HCM Control Delay (s)	10.1	-	-	-	13.9	
HCM Lane LOS	B	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Lanes, Volumes, Timings
31: Ridge Run Rd & Site Driveway

2028 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	10	14	27	29	0
Future Volume (vph)	0	10	14	27	29	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1630	1632	0
Flt Permitted				0.983		
Satd. Flow (perm)	1611	0	0	1630	1632	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	435			1286	904	
Travel Time (s)	11.9			25.1	17.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	12%	7%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	46	32	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
31: Ridge Run Rd & Site Driveway

2028 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	14	27	29	0
Future Vol, veh/h	0	10	14	27	29	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	12	7	2
Mvmt Flow	0	11	16	30	32	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	94	32	32	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	62	-	-	-	-	-
Critical Hdwy	6.42	6.22	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	1055	1114	1177	-	-	-
Stage 1	1159	-	-	-	-	-
Stage 2	1122	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1040	1114	1177	-	-	-
Mov Cap-2 Maneuver	1040	-	-	-	-	-
Stage 1	1143	-	-	-	-	-
Stage 2	1122	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.3	2.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1177	-	1114	-	-
HCM Lane V/C Ratio	0.013	-	0.01	-	-
HCM Control Delay (s)	8.1	0	8.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2028 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	23	34	6	44	124	47	356	9	33	221	79
Future Volume (vph)	71	23	34	6	44	124	47	356	9	33	221	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1300	0	0	1537	0	0	1665	0	0	1527	0
Flt Permitted		0.973			0.998			0.994			0.995	
Satd. Flow (perm)	0	1300	0	0	1537	0	0	1665	0	0	1527	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	181	0	0	429	0	0	346	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.6% ICU Level of Service B

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	18.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	71	23	34	6	44	124	47	356	9	33	221	79
Future Vol, veh/h	71	23	34	6	44	124	47	356	9	33	221	79
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	74	24	35	6	46	129	49	371	9	34	230	82
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.4	12.1	22.4	18.3
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	55%	3%	10%
Vol Thru, %	86%	18%	25%	66%
Vol Right, %	2%	27%	71%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	412	128	174	333
LT Vol	47	71	6	33
Through Vol	356	23	44	221
RT Vol	9	34	124	79
Lane Flow Rate	429	133	181	347
Geometry Grp	1	1	1	1
Degree of Util (X)	0.712	0.277	0.312	0.602
Departure Headway (Hd)	5.973	7.477	6.197	6.244
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	609	480	578	579
Service Time	3.987	5.534	4.251	4.259
HCM Lane V/C Ratio	0.704	0.277	0.313	0.599
HCM Control Delay	22.4	13.4	12.1	18.3
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	5.8	1.1	1.3	4

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	822	87	238	645	125	173
Future Volume (vph)	822	87	238	645	125	173
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1804	0	1744	1958	1571	0
Flt Permitted			0.089		0.979	
Satd. Flow (perm)	1804	0	163	1958	1571	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	10					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	999	0	262	709	327	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	46.0		12.0	58.0	22.0	
Total Split (%)	57.5%		15.0%	72.5%	27.5%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	40.8		54.0	52.8	16.8	
Actuated g/C Ratio	0.51		0.68	0.66	0.21	
v/c Ratio	1.08		0.98	0.55	0.99	
Control Delay	75.9		57.6	7.5	82.8	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	75.9		57.6	7.5	82.8	
LOS	E		E	A	F	
Approach Delay	75.9			21.0	82.8	
Approach LOS	E			C	F	
Queue Length 50th (ft)	~566		76	149	164	
Queue Length 95th (ft)	#798		m#117	m170	#326	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	924		268	1292	329	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	1.08		0.98	0.55	0.99	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 53.7

Intersection LOS: D

Intersection Capacity Utilization 95.7%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2028 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	822	87	238	645	125	173
Future Volume (veh/h)	822	87	238	645	125	173
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	903	87	262	709	137	190
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	795	77	281	1379	145	201
Arrive On Green	0.51	0.50	0.20	1.00	0.21	0.20
Sat Flow, veh/h	1558	150	1914	2090	691	958
Grp Volume(v), veh/h	0	990	262	709	328	0
Grp Sat Flow(s),veh/h/ln	0	1708	1914	2090	1653	0
Q Serve(g_s), s	0.0	40.8	6.9	0.0	15.7	0.0
Cycle Q Clear(g_c), s	0.0	40.8	6.9	0.0	15.7	0.0
Prop In Lane		0.09	1.00		0.42	0.58
Lane Grp Cap(c), veh/h	0	871	281	1379	347	0
V/C Ratio(X)	0.00	1.14	0.93	0.51	0.94	0.00
Avail Cap(c_a), veh/h	0	871	281	1379	347	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	19.6	20.3	0.0	31.4	0.0
Incr Delay (d2), s/veh	0.0	75.4	35.8	1.4	35.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	45.5	11.3	0.9	14.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	95.0	56.2	1.4	67.0	0.0
LnGrp LOS	A	F	E	A	E	A
Approach Vol, veh/h	990			971	328	
Approach Delay, s/veh	95.0			16.2	67.0	
Approach LOS	F			B	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.0	46.0		22.0		58.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	39.8		15.8		51.8
Max Q Clear Time (g_c+I1), s	8.9	42.8		17.7		2.0
Green Ext Time (p_c), s	0.0	0.0		0.0		24.3
Intersection Summary						
HCM 6th Ctrl Delay			57.6			
HCM 6th LOS			E			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	973	0	0	1128	121	1	0	2	57	0	83
Future Volume (vph)	84	973	0	0	1128	121	1	0	2	57	0	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1739	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1739	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1046	0	0	1343	0	0	3	0	61	89	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 84.5% ICU Level of Service E

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	22.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	84	973	0	0	1128	121	1	0	2	57	0	83
Future Vol, veh/h	84	973	0	0	1128	121	1	0	2	57	0	83
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	90	1046	0	0	1213	130	1	0	2	61	0	89

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1343	0	0	1046	0	0	2550	2569	1046	2505	2504	1279
Stage 1	-	-	-	-	-	-	1226	1226	-	1278	1278	-
Stage 2	-	-	-	-	-	-	1324	1343	-	1227	1226	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	502	-	-	364	-	-	25	35	308	~ 31	44	236
Stage 1	-	-	-	-	-	-	275	290	-	277	296	-
Stage 2	-	-	-	-	-	-	244	258	-	294	311	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	502	-	-	364	-	-	13	29	308	~ 27	36	236
Mov Cap-2 Maneuver	-	-	-	-	-	-	13	29	-	~ 27	36	-
Stage 1	-	-	-	-	-	-	226	238	-	227	296	-
Stage 2	-	-	-	-	-	-	152	258	-	240	255	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	114.6	\$ 380
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	36	502	-	-	364	-	-	27	236
HCM Lane V/C Ratio	0.09	0.18	-	-	-	-	-	2.27	0.378
HCM Control Delay (s)	114.6	13.7	-	-	0	-	-	\$ 890.8	29.2
HCM Lane LOS	F	B	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	0.3	0.7	-	-	0	-	-	7.4	1.7

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	799	37	154	957	18	274	3	118	24	8	17
Future Volume (vph)	15	799	37	154	957	18	274	3	118	24	8	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1576	0	1761	1742	0
Flt Permitted	0.155			0.095			0.740			0.676		
Satd. Flow (perm)	270	1766	1550	157	1697	1608	1314	1576	0	1253	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40		123			18	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	832	39	160	997	19	285	126	0	25	26	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.5	37.5	37.5	51.6	50.3	50.3	19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.64	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.13	1.00	0.05	0.65	0.93	0.02	0.92	0.27		0.08	0.06	
Control Delay	13.0	37.5	0.2	28.7	17.9	0.1	66.2	7.1		24.7	14.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	13.0	37.5	0.2	28.7	17.9	0.1	66.2	7.1		24.7	14.0	
LOS	B	D	A	C	B	A	E	A		C	B	
Approach Delay		35.4			19.1			48.1			19.2	
Approach LOS		D			B			D			B	
Queue Length 50th (ft)	3	~306	0	27	27	0	139	1		10	3	
Queue Length 95th (ft)	m4	m248	m0	m59	#701	m0	#282	42		29	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	126	828	787	251	1067	1026	313	469		299	429	
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	0.13	1.00	0.05	0.64	0.93	0.02	0.91	0.27		0.08	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 29.5

Intersection LOS: C

Intersection Capacity Utilization 102.1%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

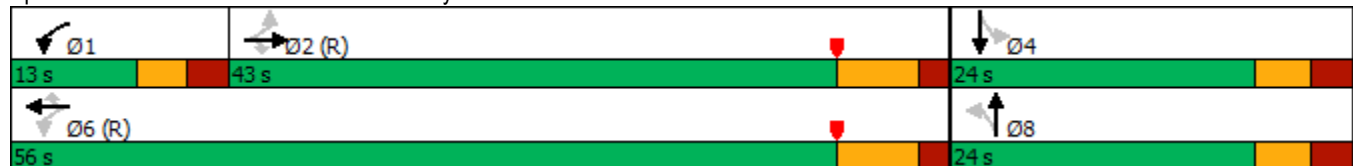
Queue shown is maximum after two cycles.

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	799	37	154	957	18	274	3	118	24	8	17
Future Volume (veh/h)	15	799	37	154	957	18	274	3	118	24	8	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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	16	832	24	160	997	16	285	3	83	25	8	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	391	999	858	505	1098	976	428	14	380	370	152	286
Arrive On Green	0.98	0.98	0.98	0.17	1.00	1.00	0.23	0.23	0.22	0.23	0.23	0.22
Sat Flow, veh/h	613	2032	1745	1666	1736	1542	1468	59	1626	1414	653	1224
Grp Volume(v), veh/h	16	832	24	160	997	16	285	0	86	25	0	23
Grp Sat Flow(s),veh/h/ln	613	2032	1745	1666	1736	1542	1468	0	1685	1414	0	1878
Q Serve(g_s), s	0.0	3.0	0.0	3.4	0.0	0.0	14.8	0.0	3.3	1.2	0.0	0.8
Cycle Q Clear(g_c), s	0.0	3.0	0.0	3.4	0.0	0.0	15.1	0.0	3.3	4.0	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.65
Lane Grp Cap(c), veh/h	391	999	858	505	1098	976	428	0	393	370	0	438
V/C Ratio(X)	0.04	0.83	0.03	0.32	0.91	0.02	0.67	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	391	999	858	541	1098	976	436	0	402	377	0	448
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)	1.00	1.00	1.00	0.49	0.49	0.49	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.3	0.4	0.3	6.4	0.0	0.0	29.4	0.0	25.2	26.2	0.0	24.0
Incr Delay (d2), s/veh	0.2	8.1	0.1	0.2	6.8	0.0	3.7	0.0	0.3	0.1	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(95%),veh/ln	0.0	4.4	0.0	1.6	3.7	0.0	9.4	0.0	2.4	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	8.4	0.4	6.6	6.8	0.0	33.2	0.0	25.4	26.3	0.0	24.1
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	872		1173				371				48	
Approach Delay, s/veh	8.1		6.7				31.4				25.2	
Approach LOS	A		A				C				C	
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	11.3	45.1	23.6			56.4		23.6				
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8		* 5.9				
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2		* 18				
Max Q Clear Time (g_c+I1), s	5.9	5.5	6.5			2.5		17.6				
Green Ext Time (p_c), s	0.1	1.1	0.1			1.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay 11.3
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	624	1	10	962	75	9	2	1	42	3	114
Future Volume (vph)	86	624	1	10	962	75	9	2	1	42	3	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%				-1%
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1831	0	1719	1506	0
Flt Permitted	0.112			0.415				0.717		0.750		
Satd. Flow (perm)	198	1729	0	693	1818	1561	0	1356	0	1357	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			120	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	658	0	11	1013	79	0	12	0	44	123	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.9	64.1		55.3	55.3	55.3		9.2		9.2	9.2	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.33	0.47		0.02	0.81	0.07		0.08		0.28	0.44	
Control Delay	5.1	8.3		3.9	15.0	0.2		30.0		36.2	12.2	
Queue Delay	0.0	0.0		0.0	0.4	0.0		0.0		0.0	0.0	
Total Delay	5.1	8.3		3.9	15.4	0.2		30.0		36.2	12.2	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		7.9			14.2			30.0			18.5	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	8	203		1	443	0		5		21	1	
Queue Length 95th (ft)	m14	m323		m2	#737	m1		19		49	46	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	278	1386		479	1257	1113		227		227	352	
Starvation Cap Reductn	0	0		0	42	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	0.33	0.47		0.02	0.83	0.07		0.05		0.19	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 12.3

Intersection LOS: B

Intersection Capacity Utilization 78.4%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2028 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	624	1	10	962	75	9	2	1	42	3	114
Future Volume (veh/h)	86	624	1	10	962	75	9	2	1	42	3	114
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	0.99		1.00	0.99		0.98
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	91	657	1	11	1013	70	9	2	0	44	3	64
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	503	1340	2	607	1335	1140	112	19	0	209	5	114
Arrive On Green	0.07	1.00	1.00	1.00	1.00	1.00	0.06	0.08	0.00	0.08	0.08	0.06
Sat Flow, veh/h	1629	1680	3	750	1935	1652	398	248	0	1376	69	1475
Grp Volume(v), veh/h	91	0	658	11	1013	70	11	0	0	44	0	67
Grp Sat Flow(s),veh/h/ln	1629	0	1682	750	1935	1652	645	0	0	1376	0	1544
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	1.9	0.0	3.4
Prop In Lane	1.00		0.00	1.00		1.00	0.82		0.00	1.00		0.96
Lane Grp Cap(c), veh/h	503	0	1342	607	1335	1140	123	0	0	209	0	119
V/C Ratio(X)	0.18	0.00	0.49	0.02	0.76	0.06	0.09	0.00	0.00	0.21	0.00	0.56
Avail Cap(c_a), veh/h	551	0	1342	607	1335	1140	250	0	0	333	0	259
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)	0.14	0.00	0.14	0.48	0.48	0.48	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.2	0.0	0.0	0.0	0.0	0.0	34.7	0.0	0.0	35.0	0.0	36.1
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.0	2.0	0.0	0.3	0.0	0.0	0.5	0.0	4.1
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(95%),veh/ln	0.3	0.0	0.1	0.0	1.3	0.0	0.4	0.0	0.0	1.5	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.0	0.2	0.0	2.0	0.0	35.0	0.0	0.0	35.5	0.0	40.2
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	749			1094			11			111		
Approach Delay, s/veh	0.4			1.9			35.0			38.3		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.6	60.6		10.8		69.2		10.8				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6		12.4		55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.6	2.5		5.4		2.5		5.4				
Green Ext Time (p_c), s	0.0	1.5		0.2		0.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				3.6								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	566	24	41	842	64	97	47	30	53	51	97
Future Volume (vph)	67	566	24	41	842	64	97	47	30	53	51	97
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1712	0	1573	1671	0	1572	1620	0	0	1818	0
Flt Permitted	0.185			0.367			0.489				0.884	
Satd. Flow (perm)	322	1712	0	607	1671	0	808	1620	0	0	1628	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			7			32			63	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	621	0	43	953	0	102	81	0	0	212	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	55.4	55.4		55.4	55.4		14.7	14.7			14.7	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.18	0.18			0.18	
v/c Ratio	0.32	0.52		0.10	0.82		0.69	0.25			0.61	
Control Delay	5.1	2.8		6.3	18.7		52.5	18.7			27.2	
Queue Delay	0.0	0.0		0.0	1.4		0.0	0.0			0.0	
Total Delay	5.1	2.8		6.3	20.0		52.5	18.7			27.2	
LOS	A	A		A	C		D	B			C	
Approach Delay		3.0			19.4			37.5			27.2	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	1	9		6	284		48	21			68	
Queue Length 95th (ft)	12	44		22	#698		91	51			122	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	222	1186		420	1159		272	567			591	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	77		0	0			2	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.32	0.52		0.10	0.88		0.38	0.14			0.36	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 16.4

Intersection LOS: B

Intersection Capacity Utilization 85.9%

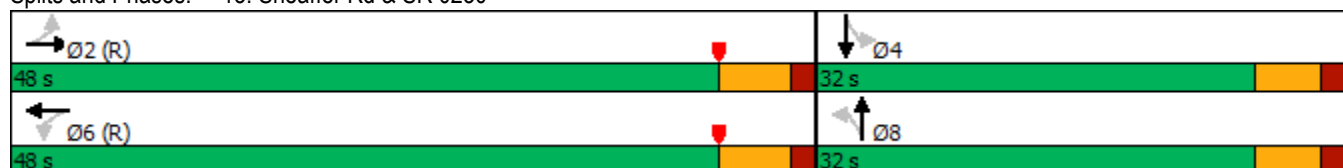
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

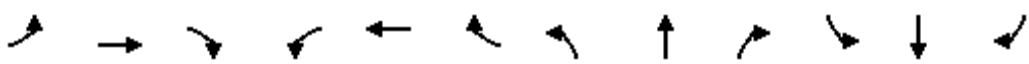
2028 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	566	24	41	842	64	97	47	30	53	51	97
Future Volume (veh/h)	67	566	24	41	842	64	97	47	30	53	51	97
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	71	596	24	43	886	65	102	49	14	56	54	81
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	324	1173	47	668	1257	92	241	200	57	117	90	109
Arrive On Green	1.00	1.00	1.00	0.72	0.72	0.71	0.16	0.16	0.14	0.14	0.16	0.14
Sat Flow, veh/h	543	1630	66	803	1746	128	1172	1276	365	375	574	699
Grp Volume(v), veh/h	71	0	620	43	0	951	102	0	63	191	0	0
Grp Sat Flow(s),veh/h/ln	543	0	1696	803	0	1874	1172	0	1641	1648	0	0
Q Serve(g_s), s	5.1	0.0	0.0	1.3	0.0	23.1	0.0	0.0	2.7	6.3	0.0	0.0
Cycle Q Clear(g_c), s	28.3	0.0	0.0	1.3	0.0	23.1	8.8	0.0	2.7	9.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.07	1.00		0.22	0.29		0.42
Lane Grp Cap(c), veh/h	324	0	1220	668	0	1349	241	0	257	296	0	0
V/C Ratio(X)	0.22	0.00	0.51	0.06	0.00	0.71	0.42	0.00	0.25	0.65	0.00	0.00
Avail Cap(c_a), veh/h	324	0	1220	668	0	1349	453	0	554	598	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)	0.88	0.00	0.88	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.7	0.0	0.0	3.3	0.0	6.4	32.2	0.0	29.7	32.6	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	1.3	0.2	0.0	3.1	1.2	0.0	0.5	2.4	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(95%),veh/ln	0.9	0.0	0.8	0.3	0.0	11.1	3.4	0.0	1.9	6.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.1	0.0	1.3	3.5	0.0	9.5	33.4	0.0	30.2	35.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	691			994			165			191		
Approach Delay, s/veh	1.9			9.3			32.1			35.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	62.5			17.5			62.5			17.5		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			11.0			25.1			10.8		
Green Ext Time (p_c), s	20.1			0.5			15.2			0.5		
Intersection Summary												
HCM 6th Ctrl Delay			11.0									
HCM 6th LOS			B									
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	789	0	124	434	213	0	0	298	48
Future Volume (vph)	0	0	0	789	0	124	434	213	0	0	298	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.302					
Satd. Flow (perm)	0	0	0	0	1653	1414	505	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	831	131	457	224	0	0	314	51
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.5	25.5	29.6	29.6			16.6	16.6
Actuated g/C Ratio					0.39	0.39	0.46	0.46			0.26	0.26
v/c Ratio					1.27	0.20	1.25	0.32			0.74	0.10
Control Delay					157.8	2.9	154.0	12.8			34.6	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					157.8	2.9	154.0	12.8			34.6	0.4
LOS					F	A	F	B			C	A
Approach Delay					136.7			107.5			29.8	
Approach LOS					F			F			C	
Queue Length 50th (ft)					~430	0	~177	53			113	0
Queue Length 95th (ft)					#629	23	#393	97			#221	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2028 Build

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					652	649	365	702			436	536
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					1.27	0.20	1.25	0.32			0.72	0.10

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 64.6

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.27

Intersection Signal Delay: 107.4

Intersection LOS: F

Intersection Capacity Utilization 174.7%

ICU Level of Service H

Analysis Period (min) 15

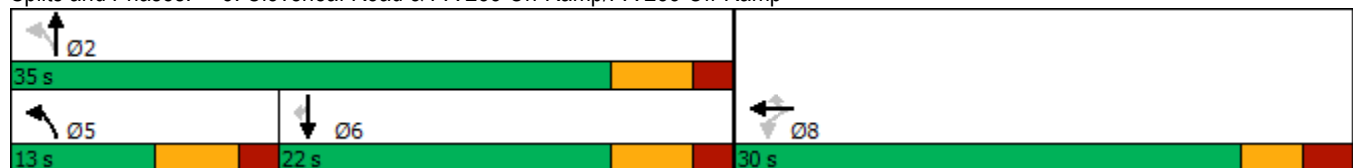
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	789	0	124	434	213	0	0	298	48
Future Volume (veh/h)	0	0	0	789	0	124	434	213	0	0	298	48
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				831	0	0	457	224	0	0	314	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				724	0		398	701	0	0	423	
Arrive On Green				0.39	0.00	0.00	0.13	0.44	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				831	0	0	457	224	0	0	314	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				25.5	0.0	0.0	8.0	5.8	0.0	0.0	10.2	0.0
Cycle Q Clear(g_c), s				25.5	0.0	0.0	8.0	5.8	0.0	0.0	10.2	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				724	0		398	701	0	0	423	
V/C Ratio(X)				1.15	0.00		1.15	0.32	0.00	0.00	0.74	
Avail Cap(c_a), veh/h				724	0		398	755	0	0	484	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.2	0.0	0.0	20.0	11.4	0.0	0.0	22.2	0.0
Incr Delay (d2), s/veh				81.9	0.0	0.0	92.3	0.9	0.0	0.0	9.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				37.8	0.0	0.0	18.9	3.3	0.0	0.0	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				101.0	0.0	0.0	112.3	12.3	0.0	0.0	31.9	0.0
LnGrp LOS				F	A		F	B	A	A	C	
Approach Vol, veh/h					831			681			314	
Approach Delay, s/veh					101.0			79.4			31.9	
Approach LOS					F			E			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		32.8			13.0	19.8		30.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		24.5				
Max Q Clear Time (g_c+I1), s		7.8			10.0	12.2		27.5				
Green Ext Time (p_c), s		4.4			0.0	1.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				81.1								
HCM 6th LOS				F								

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	3	660	0	0	0	0	608	657	100	995	0
Future Volume (vph)	44	3	660	0	0	0	0	608	657	100	995	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1563	1569	0	0	0	0	1668	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1563	1569	0	0	0	0	1668	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	680	0	0	0	0	1304	0	103	1026	0
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	174.7%						ICU Level of Service H					
Analysis Period (min)	15											

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2028 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	116.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	44	3	660	0	0	0	0	608	657	100	995	0
Future Vol, veh/h	44	3	660	0	0	0	0	608	657	100	995	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	45	3	680	0	0	0	0	627	677	103	1026	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1859	1859	1026	-	0	0	627	0	0
Stage 1	1232	1232	-	-	-	-	-	-	-
Stage 2	627	627	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	72	101	~ 325	0	-	-	749	-	0
Stage 1	336	309	-	0	-	-	-	-	0
Stage 2	615	532	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	62	0	~ 325	-	-	-	749	-	-
Mov Cap-2 Maneuver	62	0	-	-	-	-	-	-	-
Stage 1	336	0	-	-	-	-	-	-	-
Stage 2	530	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	504.4	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	62	325	749	-
HCM Lane V/C Ratio	-	-	0.782	2.094	0.138	-
HCM Control Delay (s)	-	-	165	528.6	10.6	-
HCM Lane LOS	-	-	F	F	B	-
HCM 95th %tile Q(veh)	-	-	3.5	49.6	0.5	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	9	8	1249	1628	10
Future Volume (vph)	3	9	8	1249	1628	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1631	0	0	1801	1781	0
Flt Permitted	0.988					
Satd. Flow (perm)	1631	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	1296	1688	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	96.3%			ICU Level of Service F		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	8	1249	1628	10
Future Vol, veh/h	3	9	8	1249	1628	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	9	8	1288	1678	10

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2987	1683	1688	0	-	0
Stage 1	1683	-	-	-	-	-
Stage 2	1304	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	16	121	359	-	-	-
Stage 1	179	-	-	-	-	-
Stage 2	278	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	15	121	359	-	-	-
Mov Cap-2 Maneuver	15	-	-	-	-	-
Stage 1	165	-	-	-	-	-
Stage 2	278	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	116.2	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	359	-	44	-	-
HCM Lane V/C Ratio	0.023	-	0.281	-	-
HCM Control Delay (s)	15.3	0	116.2	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	323	34	142	9	41	36	132	905	13	50	1144	447
Future Volume (vph)	323	34	142	9	41	36	132	905	13	50	1144	447
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1649	0	1416	1704	0	1620	1696	0	1628	1672	0
Flt Permitted	0.704			0.614			0.107			0.140		
Satd. Flow (perm)	1200	1649	0	915	1704	0	182	1696	0	240	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			38			2			63	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	340	185	0	9	81	0	139	967	0	53	1675	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	1.42	0.47		0.05	0.22		1.23	0.91		0.35	1.57	
Control Delay	235.8	16.5		20.3	14.2		131.2	14.2		13.5	278.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	235.8	16.5		20.3	14.2		131.2	14.2		13.5	278.5	
LOS	F	B		C	B		F	B		B	F	
Approach Delay		158.5			14.9			28.9			270.4	
Approach LOS		F			B			C			F	
Queue Length 50th (ft)	~171	31		3	13		~107	360		8	~895	
Queue Length 95th (ft)	#310	82		13	44		m40	m157		33	#1137	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	240	397		183	371		113	1060		150	1068	
Starvation Cap Reductn	0	0		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	1.42	0.47		0.05	0.22		1.23	0.91		0.35	1.57	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.57

Intersection Signal Delay: 169.2

Intersection LOS: F

Intersection Capacity Utilization 141.2%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2028 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	323	34	142	9	41	36	132	905	13	50	1144	447
Future Volume (veh/h)	323	34	142	9	41	36	132	905	13	50	1144	447
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	340	36	125	9	43	24	139	953	13	53	1204	460
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	355	81	281	247	219	122	120	1141	16	216	827	316
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.42	0.42	0.41	0.63	0.63	0.61
Sat Flow, veh/h	1407	405	1407	1045	1097	612	305	1826	25	606	1324	506
Grp Volume(v), veh/h	340	0	161	9	0	67	139	0	966	53	0	1664
Grp Sat Flow(s),veh/h/ln	1407	0	1812	1045	0	1710	305	0	1850	606	0	1830
Q Serve(g_s), s	10.0	0.0	4.7	0.5	0.0	2.0	0.0	0.0	28.0	4.8	0.0	37.5
Cycle Q Clear(g_c), s	12.0	0.0	4.7	5.2	0.0	2.0	37.5	0.0	28.0	32.8	0.0	37.5
Prop In Lane	1.00		0.78	1.00		0.36	1.00		0.01	1.00		0.28
Lane Grp Cap(c), veh/h	355	0	362	247	0	342	120	0	1157	216	0	1143
V/C Ratio(X)	0.96	0.00	0.44	0.04	0.00	0.20	1.16	0.00	0.84	0.25	0.00	1.46
Avail Cap(c_a), veh/h	355	0	362	247	0	342	120	0	1157	216	0	1143
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.00	0.09	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	21.4	23.4	0.0	20.1	36.2	0.0	14.7	23.3	0.0	11.4
Incr Delay (d2), s/veh	36.5	0.0	0.9	0.1	0.0	0.3	80.0	0.0	0.7	2.7	0.0	209.8
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(95%),veh/ln	12.9	0.0	3.5	0.2	0.0	1.3	6.1	0.0	12.9	1.4	0.0	115.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	0.0	22.3	23.4	0.0	20.4	116.2	0.0	15.4	26.0	0.0	221.1
LnGrp LOS	E	A	C	C	A	C	F	A	B	C	A	F
Approach Vol, veh/h	501			76			1105			1717		
Approach Delay, s/veh	50.0			20.8			28.1			215.1		
Approach LOS	D			C			C			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	30.0			14.0			39.5			7.2		
Green Ext Time (p_c), s	6.1			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	125.6											
HCM 6th LOS	F											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	62	0	208	17	882	5	129	1131	35
Future Volume (vph)	15	0	18	62	0	208	17	882	5	129	1131	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1611	0	0	1639	0	0	1718	1648
Flt Permitted		0.421			0.916			0.530			0.826	
Satd. Flow (perm)	0	733	1581	0	1492	0	0	870	0	0	1426	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		176			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	284	0	0	951	0	0	1327	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		9.5	9.5		9.5			41.0			41.0	41.0
Actuated g/C Ratio		0.16	0.16		0.16			0.68			0.68	0.68
v/c Ratio		0.14	0.06		0.74			1.60			1.36	0.03
Control Delay		24.1	1.6		23.3			294.5			177.9	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		24.1	1.6		23.3			294.5			177.9	0.1
LOS		C	A		C			F			F	A
Approach Delay		11.9			23.3			294.5			173.1	
Approach LOS		B			C			F			F	
Queue Length 50th (ft)		5	0		35			~1047			~706	0
Queue Length 95th (ft)		20	4		#132			m#1011			m42	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		128	322		406			595			974	1140
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		0.13	0.06		0.70			1.60			1.36	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.60

Intersection Signal Delay: 198.6

Intersection LOS: F

Intersection Capacity Utilization 156.6%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

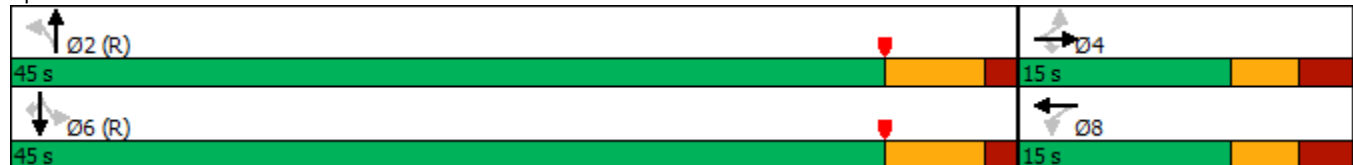
Queue shown is maximum after two cycles.

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	62	0	208	17	882	5	129	1131	35
Future Volume (veh/h)	15	0	18	62	0	208	17	882	5	129	1131	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	65	0	204	18	928	5	136	1191	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	267	0	278	127	14	207	61	698	4	127	718	1101
Arrive On Green	0.16	0.00	0.17	0.16	0.00	0.16	0.86	0.89	0.86	1.00	1.00	1.00
Sat Flow, veh/h	840	0	1586	300	77	1184	0	1047	6	91	1077	1652
Grp Volume(v), veh/h	16	0	11	269	0	0	951	0	0	1327	0	36
Grp Sat Flow(s),veh/h/ln	840	0	1586	1562	0	0	1052	0	0	1167	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.3	9.5	0.0	0.0	39.0	0.0	0.0	39.0	0.0	0.0
Prop In Lane	1.00		1.00	0.24		0.76	0.02		0.01	0.10		1.00
Lane Grp Cap(c), veh/h	253	0	278	322	0	0	745	0	0	825	0	1101
V/C Ratio(X)	0.06	0.00	0.04	0.84	0.00	0.00	1.28	0.00	0.00	1.61	0.00	0.03
Avail Cap(c_a), veh/h	253	0	278	322	0	0	745	0	0	825	0	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	21.2	0.0	20.6	25.2	0.0	0.0	13.3	0.0	0.0	4.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	17.2	0.0	0.0	134.7	0.0	0.0	274.4	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(95%),veh/ln	0.4	0.0	0.2	9.1	0.0	0.0	49.8	0.0	0.0	94.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	20.6	42.4	0.0	0.0	147.9	0.0	0.0	278.5	0.0	0.0
LnGrp LOS	C	A	C	D	A	A	F	A	A	F	A	A
Approach Vol, veh/h	27			269			951			1363		
Approach Delay, s/veh	21.1			42.4			147.9			271.2		
Approach LOS	C			D			F			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			15.0			45.0			15.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	41.0			3.0			41.0			11.5		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	200.1											
HCM 6th LOS	F											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	327	434	80	176	558	155	120	333	96	239	334	233
Future Volume (vph)	327	434	80	176	558	155	120	333	96	239	334	233
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1767	0	1604	1640	1442
Flt Permitted	0.089			0.504			0.340			0.129		
Satd. Flow (perm)	149	1791	1435	802	1697	1577	545	1767	0	218	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		11				240
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	447	82	181	575	160	124	442	0	246	344	240
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	62.5	62.5	62.5	39.5	39.5	39.5	35.0	26.0		45.0	31.0	31.0
Actuated g/C Ratio	0.52	0.52	0.52	0.33	0.33	0.33	0.29	0.22		0.38	0.26	0.26
v/c Ratio	1.17	0.48	0.10	0.69	1.03	0.26	0.54	1.13		1.01	0.81	0.44
Control Delay	141.2	20.5	2.1	52.3	87.5	10.6	35.5	127.9		57.8	38.3	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	141.2	20.5	2.1	52.3	87.5	10.6	35.5	127.9		57.8	38.3	6.0
LOS	F	C	A	D	F	B	D	F		E	D	A
Approach Delay		65.7			67.1			107.7			34.7	
Approach LOS		E			E			F			C	
Queue Length 50th (ft)	~266	213	0	133	~487	21	64	~391		~152	230	26
Queue Length 95th (ft)	#455	301	18	m#225	#714	m63	110	#598		m114	m171	m9
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	287	932	795	263	558	625	232	391		243	424	550
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.17	0.48	0.10	0.69	1.03	0.26	0.53	1.13		1.01	0.81	0.44

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.17

Intersection Signal Delay: 65.5

Intersection LOS: E

Intersection Capacity Utilization 107.9%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

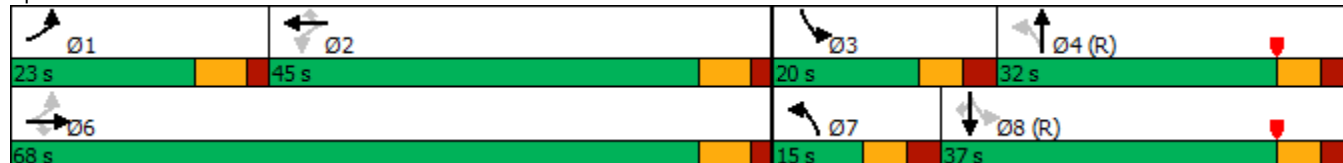
Queue shown is maximum after two cycles.

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230



HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	327	434	80	176	558	155	120	333	96	239	334	233
Future Volume (veh/h)	327	434	80	176	558	155	120	333	96	239	334	233
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	337	447	52	181	575	0	124	343	98	246	344	169
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	322	950	811	333	581		261	349	100	256	427	362
Arrive On Green	0.15	0.52	0.52	0.66	0.66	0.00	0.08	0.22	0.21	0.12	0.26	0.26
Sat Flow, veh/h	1736	1823	1557	829	1766	1544	1880	1612	461	1616	1655	1402
Grp Volume(v), veh/h	337	447	52	181	575	0	124	0	441	246	344	169
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	829	1766	1544	1880	0	2073	1616	1655	1402
Q Serve(g_s), s	17.5	18.7	2.0	15.9	38.3	0.0	6.0	0.0	25.4	14.0	23.4	12.2
Cycle Q Clear(g_c), s	17.5	18.7	2.0	15.9	38.3	0.0	6.0	0.0	25.4	14.0	23.4	12.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	322	950	811	333	581		261	0	449	256	427	362
V/C Ratio(X)	1.05	0.47	0.06	0.54	0.99		0.48	0.00	0.98	0.96	0.80	0.47
Avail Cap(c_a), veh/h	322	950	811	333	581		261	0	449	256	427	362
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	18.3	14.3	16.5	20.3	0.0	33.8	0.0	46.9	33.5	41.7	37.5
Incr Delay (d2), s/veh	63.2	0.1	0.0	1.0	34.3	0.0	1.3	0.0	38.2	44.9	14.9	4.3
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(95%),veh/ln	16.6	11.8	1.2	3.7	18.4	0.0	5.2	0.0	24.9	13.3	16.5	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.6	18.4	14.3	17.5	54.6	0.0	35.2	0.0	85.1	78.5	56.5	41.8
LnGrp LOS	F	B	B	B	D		D	A	F	E	E	D
Approach Vol, veh/h	836			756			565			759		
Approach Delay, s/veh	50.9			45.7			74.1			60.4		
Approach LOS	D			D			E			E		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	23.0	45.0	20.0	32.0		68.0	15.0	37.0				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	20.0	40.8	16.5	27.4		21.2	8.5	25.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0		0.1	0.0	1.1				

Intersection Summary

HCM 6th Ctrl Delay 56.5

HCM 6th LOS E

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	46	0	0	270	34	669	74	276	799	87
Future Volume (vph)	0	0	46	0	0	270	34	669	74	276	799	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Storage Length (ft)	0		0	0		0	75		150	325		175
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1611	0	0	1611	1752	1844	1567	1787	1881	1599
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	0	1611	0	0	1611	1752	1844	1567	1787	1881	1599
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	50	0	0	293	37	727	80	300	868	95
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 58.6%

ICU Level of Service B

Analysis Period (min) 15

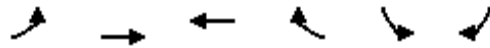
HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2028 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗	↗	↗	↗	↗
Traffic Vol, veh/h	0	0	46	0	0	270	34	669	74	276	799	87
Future Vol, veh/h	0	0	46	0	0	270	34	669	74	276	799	87
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	75	-	150	325	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	50	0	0	293	37	727	80	300	868	95
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	868	-	-	727	963	0	0	807	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.7	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.1	-	-	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	368	0	0	445	496	-	-	688	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	368	-	-	445	496	-	-	688	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	16.3		27.4		0.6		3.4					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	496	-	-	368	445	688	-	-				
HCM Lane V/C Ratio	0.075	-	-	0.136	0.66	0.436	-	-				
HCM Control Delay (s)	12.8	-	-	16.3	27.4	14.2	-	-				
HCM Lane LOS	B	-	-	C	D	B	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.5	4.7	2.2	-	-				

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

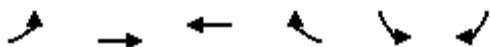
2028 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	239	523	514	111	164	403
Future Volume (vph)	239	523	514	111	164	403
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1748	1500	1676	1500
Flt Permitted	0.322				0.950	
Satd. Flow (perm)	568	1782	1748	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				123		271
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	3%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	266	581	571	123	182	448
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	13.0	82.0	69.0	69.0	38.0	13.0
Total Split (%)	10.8%	68.3%	57.5%	57.5%	31.7%	10.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	90.5	90.5	72.5	72.5	19.5	37.5
Actuated g/C Ratio	0.75	0.75	0.60	0.60	0.16	0.31
v/c Ratio	0.49	0.43	0.54	0.13	0.67	0.69
Control Delay	8.4	8.8	17.8	2.7	58.7	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	8.8	17.8	2.7	58.7	18.3
LOS	A	A	B	A	E	B
Approach Delay		8.7	15.1		30.0	
Approach LOS		A	B		C	
Queue Length 50th (ft)	84	215	246	0	134	118
Queue Length 95th (ft)	m117	m272	413	29	200	215
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	547	1343	1056	955	460	654

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2028 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.49	0.43	0.54	0.13	0.40	0.69

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 16.9

Intersection LOS: B

Intersection Capacity Utilization 64.6%

ICU Level of Service C

Analysis Period (min) 15

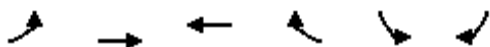
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

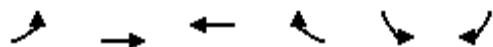
2028 Build
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	239	523	514	111	164	403
Future Volume (veh/h)	239	523	514	111	164	403
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	1772	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	266	581	571	123	182	448
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	3	2	2	2
Cap, veh/h	392	1146	938	801	464	513
Arrive On Green	0.13	1.00	0.53	0.53	0.28	0.28
Sat Flow, veh/h	1688	1786	1758	1502	1688	1502
Grp Volume(v), veh/h	266	581	571	123	182	448
Grp Sat Flow(s),veh/h/ln	1688	1786	1758	1502	1688	1502
Q Serve(g_s), s	8.0	0.0	26.9	5.0	10.5	33.0
Cycle Q Clear(g_c), s	8.0	0.0	26.9	5.0	10.5	33.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	392	1146	938	801	464	513
V/C Ratio(X)	0.68	0.51	0.61	0.15	0.39	0.87
Avail Cap(c_a), veh/h	392	1146	938	801	464	513
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	19.4	14.2	35.3	37.1
Incr Delay (d2), s/veh	4.7	1.6	2.9	0.4	0.5	15.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.7	0.9	16.3	3.1	7.9	20.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.6	1.6	22.3	14.6	35.9	52.3
LnGrp LOS	C	A	C	B	D	D
Approach Vol, veh/h		847	694		630	
Approach Delay, s/veh		8.2	20.9		47.6	
Approach LOS		A	C		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.0	69.0			82.0	38.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	63.0			76.0	32.0
Max Q Clear Time (g_c+I1), s	10.0	28.9			2.0	35.0
Green Ext Time (p_c), s	0.0	2.8			2.4	0.0
Intersection Summary						
HCM 6th Ctrl Delay			23.7			
HCM 6th LOS			C			

Lanes, Volumes, Timings
28: SR 0230 & Western Parcels Access

2028 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	713	861	51	129	49
Future Volume (vph)	43	713	861	51	129	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12
Grade (%)		1%	-1%		0%	
Storage Length (ft)	500			150	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1702	1809	1758	1591	1731	0
Flt Permitted	0.950				0.965	
Satd. Flow (perm)	1702	1809	1758	1591	1731	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		1000	940		500	
Travel Time (s)		15.2	14.2		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	792	957	57	197	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 62.1% ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	15.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	713	861	51	129	49
Future Vol, veh/h	43	713	861	51	129	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	1	-1	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	1	5	2	2	2
Mvmt Flow	48	792	957	57	143	54
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1014	0	-	0	1845	957
Stage 1	-	-	-	-	957	-
Stage 2	-	-	-	-	888	-
Critical Hdwy	4.5	-	-	-	6.8	10
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	500	-	-	-	~ 72	119
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	446	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	500	-	-	-	~ 65	119
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	446	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.7	0		158.7		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	500	-	-	-	176	
HCM Lane V/C Ratio	0.096	-	-	-	1.124	
HCM Control Delay (s)	13	-	-	-	158.7	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	0.3	-	-	-	10.1	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2028 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	642	579	90	74	1
Future Volume (vph)	6	642	579	90	74	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1759	0	1670	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1759	0	1670	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	669	697	0	78	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 46.8% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	642	579	90	74	1
Future Vol, veh/h	6	642	579	90	74	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	669	603	94	77	1
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	697	0	-	0	1331	650
Stage 1	-	-	-	-	650	-
Stage 2	-	-	-	-	681	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	715	-	-	-	161	478
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	525	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	715	-	-	-	160	478
Mov Cap-2 Maneuver	-	-	-	-	316	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	525	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		20		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	715	-	-	-	317	
HCM Lane V/C Ratio	0.009	-	-	-	0.246	
HCM Control Delay (s)	10.1	-	-	-	20	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	1	

Lanes, Volumes, Timings
31: Ridge Run Rd & Site Driveway

2028 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	36	33	63	39	0
Future Volume (vph)	0	36	33	63	39	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1735	1747	0
Flt Permitted				0.983		
Satd. Flow (perm)	1611	0	0	1735	1747	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	435			1319	1011	
Travel Time (s)	11.9			25.7	19.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	0	0	107	43	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
31: Ridge Run Rd & Site Driveway

2028 Build
PM Peak Hour

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	36	33	63	39	0
Future Vol, veh/h	0	36	33	63	39	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	0	2
Mvmt Flow	0	40	37	70	43	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	187	43	43	0	-	0
Stage 1	43	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.42	6.2	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	928	1098	1169	-	-	-
Stage 1	1145	-	-	-	-	-
Stage 2	1025	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	897	1098	1169	-	-	-
Mov Cap-2 Maneuver	897	-	-	-	-	-
Stage 1	1107	-	-	-	-	-
Stage 2	1025	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	2.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1169	-	1098	-	-	
HCM Lane V/C Ratio	0.031	-	0.036	-	-	
HCM Control Delay (s)	8.2	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2028 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	83	78	4	52	80	33	375	6	111	426	65
Future Volume (vph)	94	83	78	4	52	80	33	375	6	111	426	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1382	0	0	1561	0	0	1674	0	0	1572	0
Flt Permitted		0.982			0.999			0.996			0.991	
Satd. Flow (perm)	0	1382	0	0	1561	0	0	1674	0	0	1572	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	0	141	0	0	431	0	0	628	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	90.0%											
Analysis Period (min)	15											
ICU Level of Service E												

Intersection	
Intersection Delay, s/veh	85.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	94	83	78	4	52	80	33	375	6	111	426	65
Future Vol, veh/h	94	83	78	4	52	80	33	375	6	111	426	65
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	98	86	81	4	54	83	34	391	6	116	444	68
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	24.8	15.5	41.6	157.4
HCM LOS	C	C	E	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	37%	3%	18%
Vol Thru, %	91%	33%	38%	71%
Vol Right, %	1%	31%	59%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	414	255	136	602
LT Vol	33	94	4	111
Through Vol	375	83	52	426
RT Vol	6	78	80	65
Lane Flow Rate	431	266	142	627
Geometry Grp	1	1	1	1
Degree of Util (X)	0.857	0.608	0.31	1.264
Departure Headway (Hd)	7.645	8.91	8.646	7.257
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	479	409	418	502
Service Time	5.645	6.91	6.646	5.311
HCM Lane V/C Ratio	0.9	0.65	0.34	1.249
HCM Control Delay	41.6	24.8	15.5	157.4
HCM Lane LOS	E	C	C	F
HCM 95th-tile Q	8.8	3.9	1.3	25.4

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (vph)	791	84	177	687	90	175
Future Volume (vph)	791	84	177	687	90	175
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1841	0	1761	1958	1563	0
Flt Permitted			0.077		0.983	
Satd. Flow (perm)	1841	0	143	1958	1563	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	6					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	884	0	179	694	268	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	58.7		72.9	71.7	27.9	
Actuated g/C Ratio	0.53		0.66	0.65	0.25	
v/c Ratio	0.90		0.79	0.54	0.68	
Control Delay	37.8		33.5	14.4	45.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	37.8		33.5	14.4	45.1	
LOS	D		C	B	D	
Approach Delay	37.8			18.3	45.1	
Approach LOS	D			B	D	
Queue Length 50th (ft)	532		61	295	171	
Queue Length 95th (ft)	#919		m102	m444	238	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	985		227	1276	565	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.90		0.79	0.54	0.47	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 30.4

Intersection LOS: C

Intersection Capacity Utilization 88.3%

ICU Level of Service E

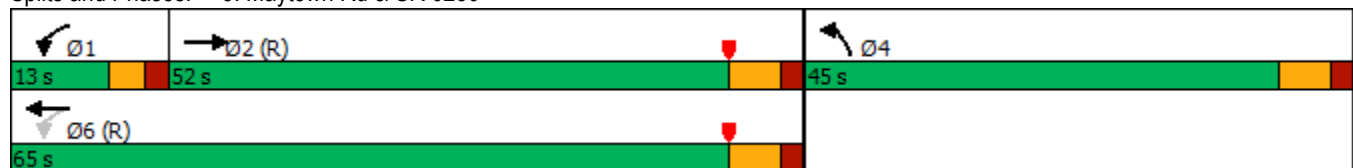
Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2028 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	791	84	177	687	90	175
Future Volume (veh/h)	791	84	177	687	90	175
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	799	83	179	694	91	177
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	946	98	311	1460	116	225
Arrive On Green	0.60	0.59	0.04	0.47	0.21	0.20
Sat Flow, veh/h	1572	163	1927	2090	559	1086
Grp Volume(v), veh/h	0	882	179	694	269	0
Grp Sat Flow(s),veh/h/ln	0	1735	1927	2090	1651	0
Q Serve(g_s), s	0.0	45.3	3.6	25.0	17.0	0.0
Cycle Q Clear(g_c), s	0.0	45.3	3.6	25.0	17.0	0.0
Prop In Lane		0.09	1.00		0.34	0.66
Lane Grp Cap(c), veh/h	0	1044	311	1460	342	0
V/C Ratio(X)	0.00	0.84	0.58	0.48	0.79	0.00
Avail Cap(c_a), veh/h	0	1044	352	1460	597	0
HCM Platoon Ratio	1.00	1.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	17.8	20.5	15.5	41.7	0.0
Incr Delay (d2), s/veh	0.0	8.4	1.8	1.1	13.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	25.8	4.8	19.1	12.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	26.2	22.3	16.6	55.1	0.0
LnGrp LOS	A	C	C	B	E	A
Approach Vol, veh/h	882			873	269	
Approach Delay, s/veh	26.2			17.7	55.1	
Approach LOS	C			B	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.6	71.4		28.0		82.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	5.6	47.3		19.0		27.0
Green Ext Time (p_c), s	0.1	0.0		2.7		18.1
Intersection Summary						
HCM 6th Ctrl Delay			26.4			
HCM 6th LOS			C			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1027	0	1	1030	125	0	0	1	73	0	36
Future Volume (vph)	17	1027	0	1	1030	125	0	0	1	73	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	1070	0	1	1203	0	0	1	0	76	38	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 79.2% ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	17.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	1027	0	1	1030	125	0	0	1	73	0	36
Future Vol, veh/h	17	1027	0	1	1030	125	0	0	1	73	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	1070	0	1	1073	130	0	0	1	76	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1203	0	0	1070	0	0	2265	2311	1070	2247	2246	1138
Stage 1	-	-	-	-	-	-	1106	1106	-	1140	1140	-
Stage 2	-	-	-	-	-	-	1159	1205	-	1107	1106	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	552	-	-	354	-	-	39	50	299	~ 46	62	282
Stage 1	-	-	-	-	-	-	319	326	-	326	336	-
Stage 2	-	-	-	-	-	-	299	296	-	339	347	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	552	-	-	354	-	-	33	48	299	~ 45	60	282
Mov Cap-2 Maneuver	-	-	-	-	-	-	33	48	-	~ 45	60	-
Stage 1	-	-	-	-	-	-	308	315	-	315	335	-
Stage 2	-	-	-	-	-	-	259	295	-	327	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	17.1	\$ 362.5
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	299	552	-	-	354	-	-	45	282
HCM Lane V/C Ratio	0.003	0.032	-	-	0.003	-	-	1.69	0.133
HCM Control Delay (s)	17.1	11.7	-	-	15.2	-	-	\$ 531.6	19.7
HCM Lane LOS	C	B	-	-	C	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	7.6	0.5

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	811	50	155	889	16	260	3	163	35	4	15
Future Volume (vph)	22	811	50	155	889	16	260	3	163	35	4	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1574	0	1761	1740	0
Flt Permitted	0.231			0.083			0.744			0.538		
Satd. Flow (perm)	401	1783	1584	137	1697	1573	1327	1574	0	997	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			172			16
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	854	53	163	936	17	274	175	0	37	20	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	56.9	56.9	56.9	75.4	74.1	74.1	25.2	25.2		25.2	25.2	
Actuated g/C Ratio	0.52	0.52	0.52	0.69	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.11	0.93	0.06	0.63	0.82	0.02	0.90	0.36		0.16	0.05	
Control Delay	19.8	36.2	3.4	35.9	15.2	2.6	74.2	7.7		35.5	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	19.8	36.2	3.4	35.9	15.2	2.6	74.2	7.7		35.5	16.9	
LOS	B	D	A	D	B	A	E	A		D	B	
Approach Delay		33.9			18.0			48.3			29.0	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	8	303	0	75	199	0	187	2		21	2	
Queue Length 95th (ft)	m14	m#809	m5	m125	386	m1	#338	56		50	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	207	922	859	322	1143	1069	314	504		236	425	
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	0.11	0.93	0.06	0.51	0.82	0.02	0.87	0.35		0.16	0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 29.4

Intersection LOS: C

Intersection Capacity Utilization 98.3%

ICU Level of Service F

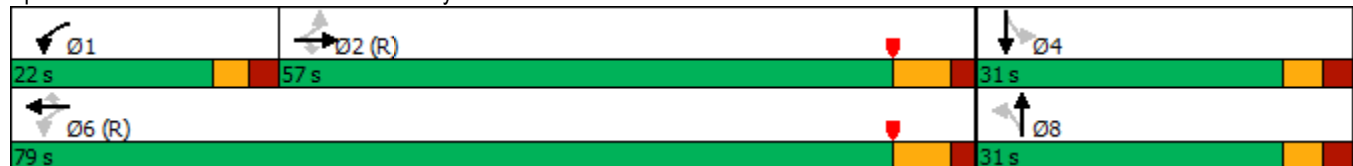
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2028 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	811	50	155	889	16	260	3	163	35	4	15
Future Volume (veh/h)	22	811	50	155	889	16	260	3	163	35	4	15
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	854	31	163	936	12	274	3	107	37	4	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	441	1179	1005	522	1195	1060	383	10	352	293	123	278
Arrive On Green	1.00	1.00	1.00	0.14	1.00	1.00	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	652	2047	1743	1666	1736	1540	1488	46	1644	1388	576	1296
Grp Volume(v), veh/h	23	854	31	163	936	12	274	0	110	37	0	13
Grp Sat Flow(s),veh/h/ln	652	2047	1743	1666	1736	1540	1488	0	1690	1388	0	1871
Q Serve(g_s), s	0.0	0.0	0.0	4.1	0.0	0.0	19.5	0.0	6.1	2.5	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.1	0.0	0.0	19.6	0.0	6.1	8.1	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.69
Lane Grp Cap(c), veh/h	441	1179	1005	522	1195	1060	383	0	362	293	0	401
V/C Ratio(X)	0.05	0.72	0.03	0.31	0.78	0.01	0.72	0.00	0.30	0.13	0.00	0.03
Avail Cap(c_a), veh/h	441	1179	1005	669	1195	1060	417	0	401	325	0	444
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)	1.00	1.00	1.00	0.57	0.57	0.57	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.2	0.0	0.0	41.7	0.0	36.7	39.5	0.0	34.5
Incr Delay (d2), s/veh	0.2	3.9	0.1	0.2	3.0	0.0	5.3	0.0	0.5	0.2	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(95%),veh/ln	0.0	2.3	0.0	2.1	1.8	0.0	12.3	0.0	4.7	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	3.9	0.1	6.4	3.0	0.0	47.0	0.0	37.2	39.7	0.0	34.5
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	908			1111			384			50		
Approach Delay, s/veh	3.7			3.5			44.2			38.4		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	12.3	69.2	28.5			81.5	28.5					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25			72.2	* 25					
Max Q Clear Time (g_c+I1), s	6.6	2.5	10.6			2.5	22.1					
Green Ext Time (p_c), s	0.3	1.1	0.1			1.3	0.4					

Intersection Summary

HCM 6th Ctrl Delay 10.6
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	757	12	4	871	67	9	3	10	62	39	130
Future Volume (vph)	109	757	12	4	871	67	9	3	10	62	39	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1743	0	1744	1818	1561	0	1765	0	1719	1573	0
Flt Permitted	0.172			0.352				0.590		0.742		
Satd. Flow (perm)	303	1743	0	646	1818	1561	0	1062	0	1342	1573	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				80		11			139	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	827	0	4	937	72	0	24	0	67	182	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.9	88.0		75.2	75.2	75.2		12.0		12.0	12.0	
Actuated g/C Ratio	0.81	0.80		0.68	0.68	0.68		0.11		0.11	0.11	
v/c Ratio	0.34	0.59		0.01	0.75	0.07		0.19		0.46	0.62	
Control Delay	7.2	8.5		5.0	16.4	0.9		32.1		55.0	22.4	
Queue Delay	0.0	0.0		0.0	0.3	0.0		0.0		0.0	0.0	
Total Delay	7.2	8.5		5.0	16.7	0.9		32.1		55.0	22.4	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		8.4			15.5			32.1			31.2	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	21	188		0	444	1		8		45	28	
Queue Length 95th (ft)	m31	m286		m2	726	m3		33		87	95	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	363	1394		441	1242	1092		234		285	444	
Starvation Cap Reductn	0	0		0	50	0		0		0	0	
Spillback Cap Reductn	0	15		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.32	0.60		0.01	0.79	0.07		0.10		0.24	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 14.4

Intersection LOS: B

Intersection Capacity Utilization 78.9%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2028 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	757	12	4	871	67	9	3	10	62	39	130
Future Volume (veh/h)	109	757	12	4	871	67	9	3	10	62	39	130
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	117	814	11	4	937	59	10	3	7	67	42	69
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	518	1357	18	566	1400	1195	67	27	24	191	60	99
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09
Sat Flow, veh/h	1629	1670	23	692	1935	1652	183	283	251	1375	623	1023
Grp Volume(v), veh/h	117	0	825	4	937	59	20	0	0	67	0	111
Grp Sat Flow(s),veh/h/ln	1629	0	1693	692	1935	1652	717	0	0	1375	0	1646
Q Serve(g_s), s	1.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.2
Cycle Q Clear(g_c), s	1.8	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	5.6	0.0	7.2
Prop In Lane	1.00		0.01	1.00		1.00	0.50		0.35	1.00		0.62
Lane Grp Cap(c), veh/h	518	0	1375	566	1400	1195	112	0	0	191	0	159
V/C Ratio(X)	0.23	0.00	0.60	0.01	0.67	0.05	0.18	0.00	0.00	0.35	0.00	0.70
Avail Cap(c_a), veh/h	580	0	1375	566	1400	1195	279	0	0	351	0	350
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(l)	0.32	0.00	0.32	0.76	0.76	0.76	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.4	0.0	0.0	0.0	0.0	0.0	45.9	0.0	0.0	47.4	0.0	48.4
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.0	2.0	0.1	0.8	0.0	0.0	1.1	0.0	5.4
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(95%),veh/ln	0.6	0.0	0.4	0.0	1.4	0.0	1.0	0.0	0.0	3.3	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.5	0.0	0.6	0.0	2.0	0.1	46.7	0.0	0.0	48.5	0.0	53.8
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	942		1000				20		178			
Approach Delay, s/veh	0.9		1.8				46.7		51.8			
Approach LOS	A		A				D		D			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.8	85.0	15.2		94.8		15.2					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.3	2.5	9.2		2.5		9.3					
Green Ext Time (p_c), s	0.1	1.4	0.5		1.1		0.0					
Intersection Summary												
HCM 6th Ctrl Delay			6.0									
HCM 6th LOS			A									

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	735	24	21	752	13	67	24	18	16	21	76
Future Volume (vph)	55	735	24	21	752	13	67	24	18	16	21	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1747	0	1620	1700	0	1541	1658	0	0	1823	0
Flt Permitted	0.302			0.305			0.529				0.950	
Satd. Flow (perm)	525	1747	0	520	1700	0	858	1658	0	0	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			1			19			80	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	799	0	22	806	0	71	44	0	0	119	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.5	86.5		86.5	86.5		13.6	13.6			13.6	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12			0.12	
v/c Ratio	0.14	0.58		0.05	0.60		0.67	0.20			0.42	
Control Delay	6.3	9.3		3.9	7.8		74.1	28.7			20.7	
Queue Delay	0.0	0.1		0.0	0.2		0.0	0.0			0.0	
Total Delay	6.3	9.4		3.9	8.0		74.1	28.7			20.7	
LOS	A	A		A	A		E	C			C	
Approach Delay		9.2			7.9			56.7			20.7	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	13	232		3	187		49	16			25	
Queue Length 95th (ft)	m24	262		11	370		94	47			75	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	412	1373		408	1336		319	629			700	
Starvation Cap Reductn	0	77		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	91		0	0			4	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.14	0.62		0.05	0.65		0.22	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 12.2

Intersection LOS: B

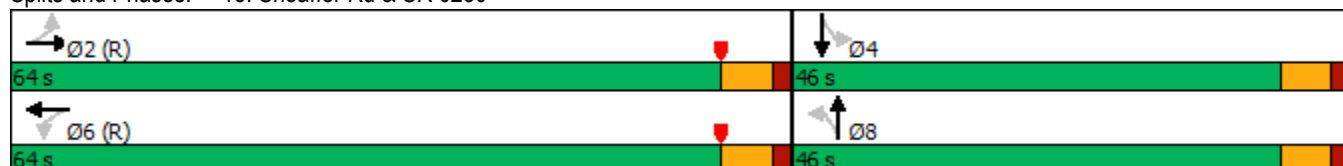
Intersection Capacity Utilization 70.2%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

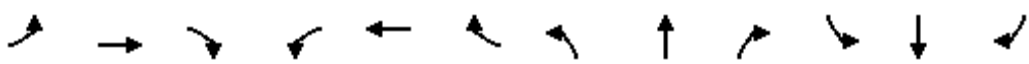
13: Sheaffer Rd & SR 0230

2028 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	735	24	21	752	13	67	24	18	16	21	76
Future Volume (veh/h)	55	735	24	21	752	13	67	24	18	16	21	76
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	58	774	20	22	792	13	71	25	7	17	22	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	507	1402	36	647	1561	26	172	102	29	63	52	63
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	623	1684	44	699	1875	31	1242	1315	368	287	676	815
Grp Volume(v), veh/h	58	0	794	22	0	805	71	0	32	72	0	0
Grp Sat Flow(s),veh/h/ln	623	0	1728	699	0	1906	1242	0	1683	1778	0	0
Q Serve(g_s), s	1.7	0.0	0.0	0.6	0.0	13.5	1.0	0.0	2.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	15.2	0.0	0.0	0.6	0.0	13.5	5.2	0.0	2.0	4.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.22	0.24		0.46
Lane Grp Cap(c), veh/h	507	0	1438	647	0	1587	172	0	131	162	0	0
V/C Ratio(X)	0.11	0.00	0.55	0.03	0.00	0.51	0.41	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	507	0	1438	647	0	1587	538	0	627	675	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	0.00	0.79	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.1	0.0	0.0	1.6	0.0	2.7	49.1	0.0	47.8	49.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.2	0.1	0.0	1.2	1.6	0.0	1.0	1.9	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(95%),veh/ln	0.1	0.0	0.9	0.1	0.0	5.4	3.5	0.0	1.5	3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.5	0.0	1.2	1.7	0.0	3.8	50.7	0.0	48.8	50.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	852			827			103			72		
Approach Delay, s/veh	1.2			3.8			50.1			50.9		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.5			13.5			96.5			13.5		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.2			15.5			7.2		
Green Ext Time (p_c), s	34.4			0.2			29.4			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	7.0											
HCM 6th LOS	A											
Notes												

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↷	↷
Traffic Volume (vph)	0	0	0	582	1	60	364	181	0	0	201	28
Future Volume (vph)	0	0	0	582	1	60	364	181	0	0	201	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1640	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.952		0.453					
Satd. Flow (perm)	0	0	0	0	1640	1442	750	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	607	63	379	189	0	0	209	29
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					20.5	20.5	28.3	28.3			15.3	15.3
Actuated g/C Ratio					0.35	0.35	0.49	0.49			0.26	0.26
v/c Ratio					1.05	0.10	0.80	0.24			0.46	0.05
Control Delay					75.8	0.3	26.2	9.6			21.7	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					75.8	0.3	26.2	9.6			21.7	0.2
LOS					E	A	C	A			C	A
Approach Delay					68.7			20.7			19.1	
Approach LOS					E			C			B	
Queue Length 50th (ft)					~245	0	83	36			61	0
Queue Length 95th (ft)					#427	0	#188	68			114	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					576	613	476	844			507	570
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					1.05	0.10	0.80	0.22			0.41	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 42.2

Intersection LOS: D

Intersection Capacity Utilization 129.8%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2028 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	582	1	60	364	181	0	0	201	28
Future Volume (veh/h)	0	0	0	582	1	60	364	181	0	0	201	28
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				606	1	0	379	189	0	0	209	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				653	1		508	793	0	0	432	
Arrive On Green				0.35	0.37	0.00	0.14	0.46	0.00	0.00	0.23	0.00
Sat Flow, veh/h				1782	3	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				607	0	0	379	189	0	0	209	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				18.3	0.0	0.0	8.0	3.7	0.0	0.0	5.4	0.0
Cycle Q Clear(g_c), s				18.3	0.0	0.0	8.0	3.7	0.0	0.0	5.4	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				654	0		508	793	0	0	432	
V/C Ratio(X)				0.93	0.00		0.75	0.24	0.00	0.00	0.48	
Avail Cap(c_a), veh/h				654	0		508	915	0	0	565	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.5	0.0	0.0	14.8	9.0	0.0	0.0	18.6	0.0
Incr Delay (d2), s/veh				19.7	0.0	0.0	5.9	0.6	0.0	0.0	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
%ile BackOfQ(95%),veh/ln				15.7	0.0	0.0	6.6	2.1	0.0	0.0	4.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				37.3	0.0	0.0	20.7	9.6	0.0	0.0	21.6	0.0
LnGrp LOS				D	A		C	A	A	A	C	
Approach Vol, veh/h					607			568			209	
Approach Delay, s/veh					37.3			17.0			21.6	
Approach LOS					D			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		25.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		5.7			10.0	7.4		20.3				
Green Ext Time (p_c), s		3.8			0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				26.6								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	379	0	0	0	0	513	574	88	697	0
Future Volume (vph)	24	0	379	0	0	0	0	513	574	88	697	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1674	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1674	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	408	0	0	0	0	1169	0	95	749	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 129.8%

ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2028 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	8.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	24	0	379	0	0	0	0	513	574	88	697	0
Future Vol, veh/h	24	0	379	0	0	0	0	513	574	88	697	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	26	0	408	0	0	0	0	552	617	95	749	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1491	1491	749	-	0	0	552	0	0
Stage 1	939	939	-	-	-	-	-	-	-
Stage 2	552	552	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	134	160	460	0	-	-	823	-	0
Stage 1	468	404	-	0	-	-	-	-	0
Stage 2	685	568	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	119	0	460	-	-	-	823	-	-
Mov Cap-2 Maneuver	119	0	-	-	-	-	-	-	-
Stage 1	468	0	-	-	-	-	-	-	-
Stage 2	606	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48.3	0	1.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	119	460	823	-
HCM Lane V/C Ratio	-	-	0.217	0.886	0.115	-
HCM Control Delay (s)	-	-	43.4	48.6	9.9	-
HCM Lane LOS	-	-	E	E	A	-
HCM 95th %tile Q(veh)	-	-	0.8	9.5	0.4	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	11	13	1061	1092	3
Future Volume (vph)	6	11	13	1061	1092	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1556	0	0	1800	1799	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1556	0	0	1800	1799	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	1143	1165	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	76.2%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2028 Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	13	1061	1092	3
Future Vol, veh/h	6	11	13	1061	1092	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	12	14	1129	1162	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2321	1164	1165	0	-	0
Stage 1	1164	-	-	-	-	-
Stage 2	1157	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	38	248	531	-	-	-
Stage 1	298	-	-	-	-	-
Stage 2	301	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	35	248	531	-	-	-
Mov Cap-2 Maneuver	35	-	-	-	-	-
Stage 1	277	-	-	-	-	-
Stage 2	301	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	63.6	0.1		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	531	-	79	-	-	
HCM Lane V/C Ratio	0.026	-	0.229	-	-	
HCM Control Delay (s)	12	0	63.6	-	-	
HCM Lane LOS	B	A	F	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	24	114	11	22	33	85	899	8	20	910	183
Future Volume (vph)	154	24	114	11	22	33	85	899	8	20	910	183
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1643	0	1572	1636	0	1620	1713	0	1550	1716	0
Flt Permitted	0.719			0.665			0.109			0.136		
Satd. Flow (perm)	1226	1643	0	1100	1636	0	186	1713	0	222	1716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		120			35			1			28	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	145	0	12	58	0	89	954	0	21	1151	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.8	12.8		12.8	12.8		36.7	36.7		36.7	36.7	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.61	0.61		0.61	0.61	
v/c Ratio	0.62	0.33		0.05	0.15		0.79	0.91		0.16	1.09	
Control Delay	31.8	8.1		17.9	11.0		49.3	22.5		9.4	70.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.8	8.1		17.9	11.0		49.3	22.5		9.4	70.9	
LOS	C	A		B	B		D	C		A	E	
Approach Delay		20.6			12.2			24.8			69.8	
Approach LOS		C			B			C			E	
Queue Length 50th (ft)	52	7		3	7		27	341		3	~496	
Queue Length 95th (ft)	104	44		14	30		m#57	m#570		14	#727	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	500		275	435		113	1048		135	1060	
Starvation Cap Reductn	0	0		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	0.53	0.29		0.04	0.13		0.79	0.91		0.16	1.09	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 44.3

Intersection LOS: D

Intersection Capacity Utilization 99.0%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2028 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	24	114	11	22	33	85	899	8	20	910	183
Future Volume (veh/h)	154	24	114	11	22	33	85	899	8	20	910	183
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	162	25	93	12	23	21	89	946	7	21	958	159
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	353	71	263	271	161	147	181	1187	9	237	1037	172
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.43	0.43	0.42	0.64	0.64	0.62
Sat Flow, veh/h	1436	383	1426	1192	876	800	516	1853	14	591	1618	269
Grp Volume(v), veh/h	162	0	118	12	0	44	89	0	953	21	0	1117
Grp Sat Flow(s),veh/h/ln	1436	0	1809	1192	0	1676	516	0	1867	591	0	1886
Q Serve(g_s), s	6.4	0.0	3.5	0.5	0.0	1.3	7.1	0.0	26.6	1.8	0.0	31.3
Cycle Q Clear(g_c), s	7.7	0.0	3.5	4.0	0.0	1.3	38.4	0.0	26.6	28.3	0.0	31.3
Prop In Lane	1.00		0.79	1.00		0.48	1.00		0.01	1.00		0.14
Lane Grp Cap(c), veh/h	353	0	333	271	0	309	181	0	1196	237	0	1209
V/C Ratio(X)	0.46	0.00	0.35	0.04	0.00	0.14	0.49	0.00	0.80	0.09	0.00	0.92
Avail Cap(c_a), veh/h	447	0	452	349	0	419	181	0	1196	237	0	1209
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.48	0.00	0.48	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	21.7	23.1	0.0	20.7	33.9	0.0	13.7	20.0	0.0	9.6
Incr Delay (d2), s/veh	0.9	0.0	0.6	0.1	0.0	0.2	4.5	0.0	2.8	0.7	0.0	13.1
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(95%),veh/ln	3.7	0.0	2.5	0.3	0.0	0.9	2.7	0.0	15.3	0.5	0.0	17.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	22.3	23.2	0.0	20.9	38.4	0.0	16.5	20.8	0.0	22.7
LnGrp LOS	C	A	C	C	A	C	D	A	B	C	A	C
Approach Vol, veh/h	280			56			1042			1138		
Approach Delay, s/veh	23.7			21.4			18.4			22.6		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.9			16.1			43.9			16.1		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	28.6			9.7			33.3			6.0		
Green Ext Time (p_c), s	4.6			0.4			0.2			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	21.0											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	24	0	149	16	840	7	163	889	7
Future Volume (vph)	5	1	12	24	0	149	16	840	7	163	889	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1596	0	0	1670	0	0	1714	1648
Flt Permitted		0.708			0.950			0.957			0.759	
Satd. Flow (perm)	0	1232	1581	0	1527	0	0	1600	0	0	1312	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		157			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	182	0	0	908	0	0	1108	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.4	8.4		8.4			42.1			42.1	42.1
Actuated g/C Ratio		0.14	0.14		0.14			0.70			0.70	0.70
v/c Ratio		0.03	0.05		0.52			0.81			1.21	0.01
Control Delay		21.2	0.3		11.9			15.3			111.7	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		21.2	0.3		11.9			15.3			111.7	0.0
LOS		C	A		B			B			F	A
Approach Delay		6.9			11.9			15.3			111.0	
Approach LOS		A			B			B			F	
Queue Length 50th (ft)		2	0		8			163			~529	0
Queue Length 95th (ft)		10	0		54			#504			m#523	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		236	347		419			1121			919	1168
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		0.03	0.04		0.43			0.81			1.21	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.21

Intersection Signal Delay: 62.9

Intersection LOS: E

Intersection Capacity Utilization 136.8%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

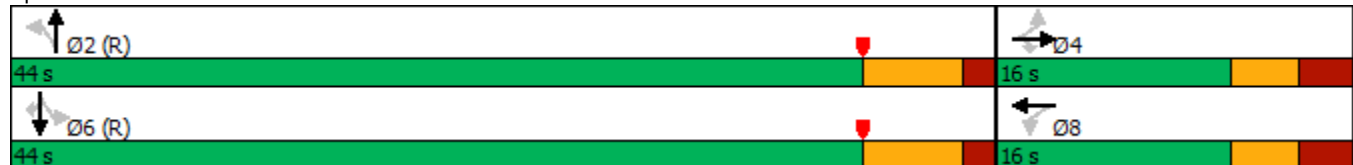
Queue shown is maximum after two cycles.

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	24	0	149	16	840	7	163	889	7
Future Volume (veh/h)	5	1	12	24	0	149	16	840	7	163	889	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	25	0	153	17	884	7	172	936	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	258	43	245	90	13	210	61	742	6	147	553	1135
Arrive On Green	0.14	0.15	0.15	0.14	0.00	0.14	0.67	0.69	0.67	1.00	1.00	1.00
Sat Flow, veh/h	956	278	1586	139	84	1362	0	1080	8	113	805	1652
Grp Volume(v), veh/h	6	0	6	178	0	0	908	0	0	1108	0	7
Grp Sat Flow(s),veh/h/ln	1234	0	1586	1584	0	0	1088	0	0	918	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	6.5	0.0	0.0	40.2	0.0	0.0	40.2	0.0	0.0
Prop In Lane	0.83		1.00	0.14		0.86	0.02		0.01	0.16		1.00
Lane Grp Cap(c), veh/h	280	0	245	287	0	0	791	0	0	685	0	1135
V/C Ratio(X)	0.02	0.00	0.02	0.62	0.00	0.00	1.15	0.00	0.00	1.62	0.00	0.01
Avail Cap(c_a), veh/h	327	0	304	345	0	0	791	0	0	685	0	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	21.9	0.0	21.5	24.6	0.0	0.0	14.4	0.0	0.0	5.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.4	0.0	0.0	81.1	0.0	0.0	278.5	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(95%),veh/ln	0.1	0.0	0.1	4.7	0.0	0.0	37.4	0.0	0.0	80.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	21.6	27.1	0.0	0.0	95.5	0.0	0.0	283.5	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	F	A	A	F	A	A
Approach Vol, veh/h	12			178			908			1115		
Approach Delay, s/veh	21.7			27.1			95.5			281.7		
Approach LOS	C			C			F			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	46.2			13.8			46.2			13.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	42.2			2.2			42.2			8.5		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay 183.5												
HCM 6th LOS F												

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	477	74	190	561	151	92	207	133	141	160	149
Future Volume (vph)	348	477	74	190	561	151	92	207	133	141	160	149
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1784	0	1558	1624	1499
Flt Permitted	0.165			0.486			0.654			0.303		
Satd. Flow (perm)	273	1809	1435	781	1731	1592	1195	1784	0	497	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		40				247
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1025			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	355	487	76	194	572	154	94	347	0	144	163	152
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	32.4	32.4	32.4	18.7	18.7	18.7	22.5	16.4		22.5	16.4	16.4
Actuated g/C Ratio	0.46	0.46	0.46	0.26	0.26	0.26	0.32	0.23		0.32	0.23	0.23
v/c Ratio	1.31	0.59	0.10	0.95	1.26	0.25	0.22	0.79		0.52	0.44	0.28
Control Delay	182.6	19.7	0.3	83.1	160.5	1.3	15.1	38.1		21.9	28.7	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	182.6	19.7	0.3	83.1	160.5	1.3	15.1	38.1		21.9	28.7	1.8
LOS	F	B	A	F	F	A	B	D		C	C	A
Approach Delay		81.1			117.5			33.2			17.6	
Approach LOS		F			F			C			B	
Queue Length 50th (ft)	~182	171	0	~92	~354	0	26	134		41	65	0
Queue Length 95th (ft)	#342	270	0	#219	#540	4	54	#261		79	120	6
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	272	824	741	205	455	607	439	474		278	404	559
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.31	0.59	0.10	0.95	1.26	0.25	0.21	0.73		0.52	0.40	0.27

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 71.1

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 75.0

Intersection LOS: E

Intersection Capacity Utilization 99.0%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	348	477	74	190	561	151	92	207	133	141	160	149
Future Volume (veh/h)	348	477	74	190	561	151	92	207	133	141	160	149
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	355	487	70	194	572	0	94	211	133	144	163	70
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	289	810	686	288	457		466	261	165	323	403	356
Arrive On Green	0.11	0.44	0.44	0.51	0.51	0.00	0.07	0.21	0.19	0.11	0.25	0.25
Sat Flow, veh/h	1723	1837	1557	792	1794	1557	2069	1253	790	1576	1641	1450
Grp Volume(v), veh/h	355	487	70	194	572	0	94	0	344	144	163	70
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	792	1794	1557	2069	0	2043	1576	1641	1450
Q Serve(g_s), s	8.0	14.7	1.9	17.3	18.5	0.0	2.5	0.0	11.7	5.0	6.0	2.8
Cycle Q Clear(g_c), s	8.0	14.7	1.9	18.5	18.5	0.0	2.5	0.0	11.7	5.0	6.0	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	289	810	686	288	457		466	0	425	323	403	356
V/C Ratio(X)	1.23	0.60	0.10	0.67	1.25		0.20	0.00	0.81	0.45	0.40	0.20
Avail Cap(c_a), veh/h	289	810	686	288	457		544	0	492	323	403	356
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	15.5	11.9	18.6	17.8	0.0	19.8	0.0	27.6	19.6	22.9	21.7
Incr Delay (d2), s/veh	129.5	0.9	0.0	4.9	130.1	0.0	0.2	0.0	8.6	1.0	0.7	0.3
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(95%),veh/ln	21.0	9.1	1.1	3.9	31.6	0.0	2.1	0.0	10.8	3.1	4.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	149.4	16.4	11.9	23.6	147.9	0.0	20.0	0.0	36.1	20.5	23.6	22.0
LnGrp LOS	F	B	B	C	F		B	A	D	C	C	C
Approach Vol, veh/h	912				766				438			
Approach Delay, s/veh	67.8				116.4				32.7			
Approach LOS	E				F				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	24.0	14.0	21.1		37.5	11.3	23.8				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	10.5	21.0	7.5	13.7		17.2	5.0	8.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5		0.2	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay 69.7
HCM 6th LOS E

Notes

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

Lanes, Volumes, Timings
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	42	0	0	328	44	478	84	355	404	113
Future Volume (vph)	0	0	42	0	0	328	44	478	84	355	404	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Storage Length (ft)	0		0	0		0	75		150	325		175
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1611	0	0	1611	1752	1844	1567	1787	1863	1599
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	0	1611	0	0	1611	1752	1844	1567	1787	1863	1599
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	47	0	0	364	49	531	93	394	449	126
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 52.1% ICU Level of Service A

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2028 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗	↗	↗	↗	↗
Traffic Vol, veh/h	0	0	42	0	0	328	44	478	84	355	404	113
Future Vol, veh/h	0	0	42	0	0	328	44	478	84	355	404	113
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	75	-	150	325	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	47	0	0	364	49	531	93	394	449	126

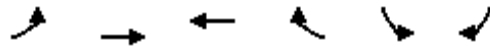
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	449	-	-	531	575	0	0	624	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	610	0	0	578	998	-	-	783	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	-	610	-	-	578	998	-	-	783	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.4		21.3		0.6		5.8	
HCM LOS	B		C					

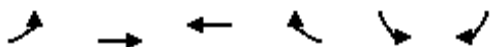
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	998	-	-	610	578	783	-
HCM Lane V/C Ratio	0.049	-	-	0.077	0.631	0.504	-
HCM Control Delay (s)	8.8	-	-	11.4	21.3	14.2	-
HCM Lane LOS	A	-	-	B	C	B	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	4.4	2.9	-

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2028 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	324	426	516	153	185	433
Future Volume (vph)	324	426	516	153	185	433
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1782	1500	1676	1500
Flt Permitted	0.216				0.950	
Satd. Flow (perm)	381	1782	1782	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				170		166
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	360	473	573	170	206	481
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	20.0	55.0	35.0	35.0	20.0	20.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	C-Max	C-Max	None	None
Act Effect Green (s)	51.3	51.3	32.9	32.9	13.7	32.1
Actuated g/C Ratio	0.68	0.68	0.44	0.44	0.18	0.43
v/c Ratio	0.73	0.39	0.73	0.23	0.68	0.65
Control Delay	17.5	6.5	25.9	3.5	40.1	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	6.5	25.9	3.5	40.1	14.9
LOS	B	A	C	A	D	B
Approach Delay		11.2	20.8		22.5	
Approach LOS		B	C		C	
Queue Length 50th (ft)	61	85	229	0	88	99
Queue Length 95th (ft)	#151	135	#399	34	156	195
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	520	1220	782	754	335	764



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.69	0.39	0.73	0.23	0.61	0.63

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 17.8

Intersection LOS: B

Intersection Capacity Utilization 70.9%

ICU Level of Service C

Analysis Period (min) 15

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

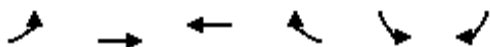
Queue shown is maximum after two cycles.

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

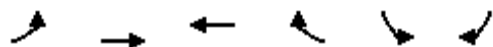
2028 Build
SAT Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	324	426	516	153	185	433
Future Volume (veh/h)	324	426	516	153	185	433
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	1772	1786	1786	1772	1772	1772
Adj Flow Rate, veh/h	360	473	573	170	206	481
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	1	2	2	2
Cap, veh/h	477	1191	806	678	338	524
Arrive On Green	0.15	0.67	0.45	0.45	0.20	0.20
Sat Flow, veh/h	1688	1786	1786	1502	1688	1502
Grp Volume(v), veh/h	360	473	573	170	206	481
Grp Sat Flow(s),veh/h/ln	1688	1786	1786	1502	1688	1502
Q Serve(g_s), s	7.6	9.0	19.4	5.3	8.3	15.0
Cycle Q Clear(g_c), s	7.6	9.0	19.4	5.3	8.3	15.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	477	1191	806	678	338	524
V/C Ratio(X)	0.75	0.40	0.71	0.25	0.61	0.92
Avail Cap(c_a), veh/h	564	1191	806	678	338	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.6	5.7	16.6	12.7	27.3	23.4
Incr Delay (d2), s/veh	4.8	1.0	5.3	0.9	3.2	21.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	4.5	12.4	3.0	6.5	16.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.4	6.7	21.9	13.6	30.5	44.8
LnGrp LOS	B	A	C	B	C	D
Approach Vol, veh/h		833	743		687	
Approach Delay, s/veh		11.3	20.0		40.5	
Approach LOS		B	B		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	16.1	38.9			55.0	20.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	14.0	29.0			49.0	14.0
Max Q Clear Time (g_c+I1), s	9.6	21.4			11.0	17.0
Green Ext Time (p_c), s	0.6	1.9			1.8	0.0
Intersection Summary						
HCM 6th Ctrl Delay			23.0			
HCM 6th LOS			C			

Lanes, Volumes, Timings
28: SR 0230 & Western Parcels Access

2028 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	63	732	732	70	167	58
Future Volume (vph)	63	732	732	70	167	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12
Grade (%)		1%	-1%		0%	
Storage Length (ft)	500			500	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1702	1809	1846	1591	1733	0
Flt Permitted	0.950				0.964	
Satd. Flow (perm)	1702	1809	1846	1591	1733	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		1000	940		500	
Travel Time (s)		15.2	14.2		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	813	813	78	250	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 64.8% ICU Level of Service C

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	12.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	63	732	732	70	167	58
Future Vol, veh/h	63	732	732	70	167	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	500	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	1	-1	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	1	0	2	2	2
Mvmt Flow	70	813	813	78	186	64
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	891	0	-	0	1766	813
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	953	-
Critical Hdwy	4.5	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	558	-	-	-	~ 82	381
Stage 1	-	-	-	-	486	-
Stage 2	-	-	-	-	414	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	558	-	-	-	~ 72	381
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	414	-
Approach	EB	WB		SB		
HCM Control Delay, s	1	0		98.6		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	558	-	-	-	251	
HCM Lane V/C Ratio	0.125	-	-	-	0.996	
HCM Control Delay (s)	12.4	-	-	-	98.6	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	0.4	-	-	-	9.6	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2028 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	50	33	16	33	84	20	297	7	58	291	56
Future Volume (vph)	61	50	33	16	33	84	20	297	7	58	291	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1671	0	0	1609	0	0	1778	0	0	1848	0
Flt Permitted		0.979			0.994			0.997			0.993	
Satd. Flow (perm)	0	1671	0	0	1609	0	0	1778	0	0	1848	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	139	0	0	337	0	0	421	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.3%											
Analysis Period (min)	15											
	ICU Level of Service B											

Intersection	
Intersection Delay, s/veh	14.4
Intersection LOS	B

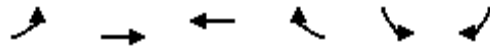
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	61	50	33	16	33	84	20	297	7	58	291	56
Future Vol, veh/h	61	50	33	16	33	84	20	297	7	58	291	56
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	64	52	34	17	34	88	21	309	7	60	303	58
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.6	10.7	14.4	16.6
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	42%	12%	14%
Vol Thru, %	92%	35%	25%	72%
Vol Right, %	2%	23%	63%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	324	144	133	405
LT Vol	20	61	16	58
Through Vol	297	50	33	291
RT Vol	7	33	84	56
Lane Flow Rate	338	150	139	422
Geometry Grp	1	1	1	1
Degree of Util (X)	0.518	0.262	0.227	0.618
Departure Headway (Hd)	5.521	6.281	5.888	5.275
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	648	569	605	679
Service Time	3.585	4.362	3.971	3.334
HCM Lane V/C Ratio	0.522	0.264	0.23	0.622
HCM Control Delay	14.4	11.6	10.7	16.6
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	3	1	0.9	4.3

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2028 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	571	619	84	78	3
Future Volume (vph)	3	571	619	84	78	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1783	0	1666	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1754	1828	1783	0	1666	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	595	733	0	84	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.8% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	571	619	84	78	3
Future Vol, veh/h	3	571	619	84	78	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	595	645	88	81	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	733	0	-	0	1290	689
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	601	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	696	-	-	-	171	452
Stage 1	-	-	-	-	520	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	696	-	-	-	170	452
Mov Cap-2 Maneuver	-	-	-	-	327	-
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	579	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		19.6		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	696	-	-	-	330	
HCM Lane V/C Ratio	0.004	-	-	-	0.256	
HCM Control Delay (s)	10.2	-	-	-	19.6	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	1	

Lanes, Volumes, Timings
34: Ridge Run Rd & Site Driveway

2028 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	46	50	37	35	0
Future Volume (vph)	0	46	50	37	35	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1730	1747	0
Flt Permitted				0.972		
Satd. Flow (perm)	1611	0	0	1730	1747	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			1310	976	
Travel Time (s)	15.6			25.5	19.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	51	0	0	97	39	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
34: Ridge Run Rd & Site Driveway

2028 Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	46	50	37	35	0
Future Vol, veh/h	0	46	50	37	35	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	2
Mvmt Flow	0	51	56	41	39	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	192	39	39	0	-	0
Stage 1	39	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Critical Hdwy	6.42	6.22	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	922	1104	1172	-	-	-
Stage 1	1150	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	877	1104	1172	-	-	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	1094	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	4.7		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1172	-	1104	-	-	
HCM Lane V/C Ratio	0.047	-	0.046	-	-	
HCM Control Delay (s)	8.2	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

APPENDIX L16

2028 BUILD WITH IMPROVEMENTS CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build w/ Improvements
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	475	80	105	442	145	160
Future Volume (vph)	475	80	105	442	145	160
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		100	150		0	150
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Satd. Flow (prot)	1726	1339	1662	1766	1605	1515
Flt Permitted			0.285		0.950	
Satd. Flow (perm)	1726	1339	498	1766	1605	1479
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		72				
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	528	89	117	491	161	178
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases	2	2	6		4	4
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	5.0
Minimum Split (s)	25.2	25.2	12.0	22.2	15.0	15.0
Total Split (s)	34.0	34.0	12.0	46.0	24.0	24.0
Total Split (%)	48.6%	48.6%	17.1%	65.7%	34.3%	34.3%
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2	4.2
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	0.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.2	6.2	4.0	5.2	5.2	6.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	33.6	32.6	44.4	43.2	16.4	15.4
Actuated g/C Ratio	0.48	0.47	0.63	0.62	0.23	0.22
v/c Ratio	0.64	0.13	0.26	0.45	0.43	0.55
Control Delay	20.3	5.7	5.2	6.4	25.9	30.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	5.7	5.2	6.4	25.9	30.3
LOS	C	A	A	A	C	C
Approach Delay	18.2			6.1	28.2	
Approach LOS	B			A	C	
Queue Length 50th (ft)	179	4	14	67	58	67
Queue Length 95th (ft)	#308	30	26	97	106	122

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build w/ Improvements
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)		100	150			150
Base Capacity (vph)	828	662	448	1088	431	376
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	0.64	0.13	0.26	0.45	0.37	0.47

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 15.7

Intersection LOS: B

Intersection Capacity Utilization 53.0%

ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Maytown Rd & SR 0230

↙ Ø1	→ Ø2 (R)	↖ Ø4
12 s	34 s	24 s
↖ Ø6 (R)		
46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2028 Build w/ Improvements
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	475	80	105	442	145	160
Future Volume (veh/h)	475	80	105	442	145	160
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	528	83	117	491	161	178
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	887	685	517	1298	308	256
Arrive On Green	0.54	0.52	0.16	1.00	0.18	0.16
Sat Flow, veh/h	1648	1307	1846	1927	1731	1564
Grp Volume(v), veh/h	528	83	117	491	161	178
Grp Sat Flow(s),veh/h/ln	1648	1307	1846	1927	1731	1564
Q Serve(g_s), s	15.2	2.3	1.6	0.0	5.9	7.5
Cycle Q Clear(g_c), s	15.2	2.3	1.6	0.0	5.9	7.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	887	685	517	1298	308	256
V/C Ratio(X)	0.60	0.12	0.23	0.38	0.52	0.70
Avail Cap(c_a), veh/h	887	685	583	1298	465	398
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	8.5	6.5	0.0	26.1	27.6
Incr Delay (d2), s/veh	2.9	0.4	0.2	0.8	4.9	11.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.1	1.1	0.8	0.5	4.9	6.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.9	8.8	6.7	0.8	31.0	39.4
LnGrp LOS	B	A	A	A	C	D
Approach Vol, veh/h	611			608	339	
Approach Delay, s/veh	13.2			2.0	35.4	
Approach LOS	B			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.5	42.9		17.6		52.4
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.6	17.2		9.5		2.0
Green Ext Time (p_c), s	0.1	6.5		1.9		13.3
Intersection Summary						
HCM 6th Ctrl Delay			13.7			
HCM 6th LOS			B			

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build w/ Improvements
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	822	87	238	645	125	173
Future Volume (vph)	822	87	238	645	125	173
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		100	150		0	150
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Satd. Flow (prot)	1827	1499	1744	1958	1653	1530
Flt Permitted			0.085		0.950	
Satd. Flow (perm)	1827	1468	156	1958	1653	1530
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		50				
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	903	96	262	709	137	190
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	4	1
Permitted Phases	2	2	6		4	4
Detector Phase	2	2	1	6	4	1
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	5.0
Minimum Split (s)	25.2	25.2	12.0	22.2	15.0	12.0
Total Split (s)	48.0	48.0	12.0	60.0	20.0	12.0
Total Split (%)	60.0%	60.0%	15.0%	75.0%	25.0%	15.0%
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	0.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.2	6.2	4.0	5.2	5.2	5.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	43.7	42.7	56.9	55.7	13.9	26.1
Actuated g/C Ratio	0.55	0.53	0.71	0.70	0.17	0.33
v/c Ratio	0.91	0.12	0.97	0.52	0.48	0.38
Control Delay	31.7	5.7	57.0	6.0	35.5	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	5.7	57.0	6.0	35.5	23.1
LOS	C	A	E	A	D	C
Approach Delay	29.2			19.7	28.3	
Approach LOS	C			B	C	
Queue Length 50th (ft)	387	11	76	125	61	71
Queue Length 95th (ft)	#658	33	m#117	m145	115	126

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build w/ Improvements
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)		100	150			150
Base Capacity (vph)	997	806	269	1362	305	499
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	0.91	0.12	0.97	0.52	0.45	0.38

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 25.1

Intersection LOS: C

Intersection Capacity Utilization 78.9%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2028 Build w/ Improvements
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	822	87	238	645	125	173
Future Volume (veh/h)	822	87	238	645	125	173
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	903	87	262	709	137	190
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	997	814	332	1494	275	348
Arrive On Green	0.57	0.56	0.18	1.00	0.15	0.14
Sat Flow, veh/h	1735	1448	1914	2090	1772	1577
Grp Volume(v), veh/h	903	87	262	709	137	190
Grp Sat Flow(s),veh/h/ln	1735	1448	1914	2090	1772	1577
Q Serve(g_s), s	36.9	2.2	4.2	0.0	5.7	8.5
Cycle Q Clear(g_c), s	36.9	2.2	4.2	0.0	5.7	8.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	997	814	332	1494	275	348
V/C Ratio(X)	0.91	0.11	0.79	0.47	0.50	0.55
Avail Cap(c_a), veh/h	997	814	350	1494	328	395
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	8.2	15.8	0.0	31.0	27.6
Incr Delay (d2), s/veh	13.3	0.3	11.0	1.1	5.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	22.1	1.2	6.2	0.8	4.9	12.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.4	8.4	26.8	1.1	36.0	32.4
LnGrp LOS	C	A	C	A	D	C
Approach Vol, veh/h	990			971	327	
Approach Delay, s/veh	26.6			8.0	33.9	
Approach LOS	C			A	C	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.3	51.1		17.6		62.4
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	41.8		13.8		53.8
Max Q Clear Time (g_c+I1), s	6.2	38.9		10.5		2.0
Green Ext Time (p_c), s	0.1	2.6		0.9		24.8
Intersection Summary						
HCM 6th Ctrl Delay			19.8			
HCM 6th LOS			B			

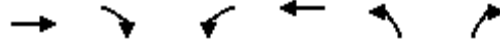
Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build w/ Improvements
SAT Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	791	84	177	687	90	175
Future Volume (vph)	791	84	177	687	90	175
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		100	150		0	150
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Satd. Flow (prot)	1863	1499	1761	1958	1670	1530
Flt Permitted			0.231		0.950	
Satd. Flow (perm)	1863	1499	428	1958	1670	1530
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		30				
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	799	85	179	694	91	177
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	4	1
Permitted Phases	2	2	6		4	4
Detector Phase	2	2	1	6	4	1
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	5.0
Minimum Split (s)	25.2	25.2	12.0	22.2	15.0	12.0
Total Split (s)	52.0	52.0	13.0	65.0	45.0	13.0
Total Split (%)	47.3%	47.3%	11.8%	59.1%	40.9%	11.8%
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	0.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.2	6.2	4.0	5.2	5.2	5.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effect Green (s)	74.4	73.4	88.6	88.5	15.4	25.4
Actuated g/C Ratio	0.68	0.67	0.81	0.80	0.14	0.23
v/c Ratio	0.63	0.08	0.40	0.44	0.39	0.50
Control Delay	14.8	6.0	4.8	5.9	47.1	40.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	6.0	4.8	5.9	47.1	40.1
LOS	B	A	A	A	D	D
Approach Delay	13.9			5.7	42.4	
Approach LOS	B			A	D	
Queue Length 50th (ft)	319	13	22	156	59	105
Queue Length 95th (ft)	513	36	m46	m318	106	163
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2028 Build w/ Improvements
SAT Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)		100	150			150
Base Capacity (vph)	1260	1010	453	1574	604	352
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	0.63	0.08	0.40	0.44	0.15	0.50

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 14.1

Intersection LOS: B

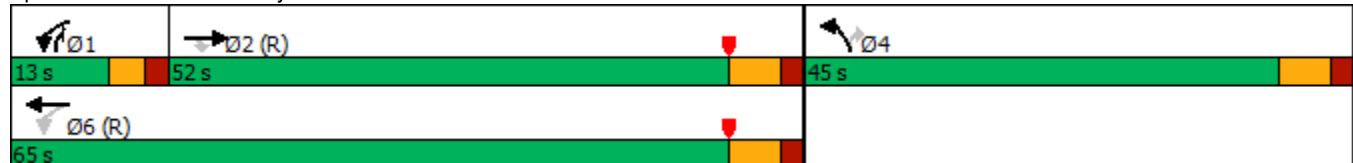
Intersection Capacity Utilization 71.6%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2028 Build w/ Improvements
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	791	84	177	687	90	175
Future Volume (veh/h)	791	84	177	687	90	175
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	799	83	179	694	91	177
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	1162	942	430	1569	276	303
Arrive On Green	0.66	0.65	0.07	1.00	0.15	0.15
Sat Flow, veh/h	1765	1450	1927	2090	1785	1577
Grp Volume(v), veh/h	799	83	179	694	91	177
Grp Sat Flow(s),veh/h/ln	1765	1450	1927	2090	1785	1577
Q Serve(g_s), s	31.1	2.3	3.1	0.1	5.0	11.2
Cycle Q Clear(g_c), s	31.1	2.3	3.1	0.1	5.0	11.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1162	942	430	1569	276	303
V/C Ratio(X)	0.69	0.09	0.42	0.44	0.33	0.58
Avail Cap(c_a), veh/h	1162	942	479	1569	646	630
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	7.2	10.8	0.0	41.4	40.4
Incr Delay (d2), s/veh	3.3	0.2	0.6	0.9	2.5	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	17.4	1.3	2.7	0.7	4.3	15.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.1	7.4	11.5	0.9	43.9	46.7
LnGrp LOS	B	A	B	A	D	D
Approach Vol, veh/h	882			873	268	
Approach Delay, s/veh	14.3			3.1	45.8	
Approach LOS	B			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.2	77.6		22.2		87.8
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	5.1	33.1		13.2		2.1
Green Ext Time (p_c), s	0.1	10.2		2.8		25.1
Intersection Summary						
HCM 6th Ctrl Delay			13.6			
HCM 6th LOS			B			

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	276	55	48	260	212	87	386	46	121	231	189
Future Volume (vph)	305	276	55	48	260	212	87	386	46	121	231	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	3153	1113	1194	3133	1561	1637	1689	0	1500	1509	1388
Flt Permitted	0.415			0.572			0.541			0.221		
Satd. Flow (perm)	649	3153	1088	718	3133	1561	932	1689	0	349	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		7				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	324	294	59	51	277	226	93	460	0	129	246	201
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	28.8	28.8	28.8	13.7	13.7	13.7	27.8	21.7		27.8	21.7	21.7
Actuated g/C Ratio	0.40	0.40	0.40	0.19	0.19	0.19	0.38	0.30		0.38	0.30	0.30
v/c Ratio	0.89	0.24	0.11	0.38	0.47	0.46	0.22	0.91		0.50	0.55	0.35
Control Delay	48.2	16.2	0.4	36.4	30.2	7.0	13.3	50.7		19.6	28.4	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	48.2	16.2	0.4	36.4	30.2	7.0	13.3	50.7		19.6	28.4	4.2
LOS	D	B	A	D	C	A	B	D		B	C	A
Approach Delay		30.1			21.3			44.4			18.0	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	118	48	0	21	62	0	23	205		33	97	0
Queue Length 95th (ft)	#276	76	0	55	98	49	52	#408		69	178	34

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	366	1440	578	178	780	568	433	507		260	449	576
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.89	0.20	0.10	0.29	0.36	0.40	0.21	0.91		0.50	0.55	0.35

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 28.4

Intersection LOS: C

Intersection Capacity Utilization 78.5%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	276	55	48	260	212	87	386	46	121	231	189
Future Volume (veh/h)	305	276	55	48	260	212	87	386	46	121	231	189
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			
Adj Sat Flow, veh/h/ln	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	324	294	46	51	277	0	93	411	47	129	246	171
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	436	1268	471	235	596		414	484	55	300	451	399
Arrive On Green	0.13	0.39	0.39	0.36	0.36	0.00	0.07	0.27	0.25	0.10	0.29	0.29
Sat Flow, veh/h	1641	3248	1206	739	3276	1532	1988	1821	208	1522	1528	1352
Grp Volume(v), veh/h	324	294	46	51	277	0	93	0	458	129	246	171
Grp Sat Flow(s),veh/h/ln	1641	1624	1206	739	1638	1532	1988	0	2029	1522	1528	1352
Q Serve(g_s), s	9.5	4.4	1.7	3.7	4.7	0.0	2.3	0.0	15.4	4.2	9.7	7.3
Cycle Q Clear(g_c), s	9.5	4.4	1.7	3.7	4.7	0.0	2.3	0.0	15.4	4.2	9.7	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	436	1268	471	235	596		414	0	539	300	451	399
V/C Ratio(X)	0.74	0.23	0.10	0.22	0.46		0.22	0.00	0.85	0.43	0.55	0.43
Avail Cap(c_a), veh/h	436	1490	553	285	820		494	0	607	316	457	404
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.8	14.7	13.9	19.9	20.2	0.0	17.0	0.0	25.1	17.6	21.3	20.5
Incr Delay (d2), s/veh	6.8	0.0	0.0	0.2	0.2	0.0	0.3	0.0	10.1	1.0	1.3	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(95%),veh/ln	8.2	2.5	0.8	1.0	2.7	0.0	1.9	0.0	13.5	2.5	6.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	14.7	13.9	20.0	20.4	0.0	17.3	0.0	35.2	18.6	22.6	21.2
LnGrp LOS	C	B	B	C	C		B	A	D	B	C	C
Approach Vol, veh/h	664				328				551			
Approach Delay, s/veh	20.9				20.3				32.2			
Approach LOS	C				C				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	13.2	25.1		33.6	11.1	27.2				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	7.2	6.7	17.4		6.9	4.8	12.2				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.7		0.2	0.1	1.4				

Intersection Summary

HCM 6th Ctrl Delay	23.9
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	327	434	80	176	558	155	120	333	96	239	334	233
Future Volume (vph)	327	434	80	176	558	155	120	333	96	239	334	233
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	3403	1435	1512	3225	1577	1522	1767	0	1604	1640	1442
Flt Permitted	0.218			0.493			0.409			0.127		
Satd. Flow (perm)	364	3403	1435	785	3225	1577	655	1767	0	214	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		11				240
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	447	82	181	575	160	124	442	0	246	344	240
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	26.0	68.0	68.0	42.0	42.0	42.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	21.7%	56.7%	56.7%	35.0%	35.0%	35.0%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	56.5	56.5	56.5	30.6	30.6	30.6	40.9	32.0		51.2	37.2	37.2
Actuated g/C Ratio	0.47	0.47	0.47	0.26	0.26	0.26	0.34	0.27		0.43	0.31	0.31
v/c Ratio	0.89	0.28	0.11	0.91	0.70	0.31	0.43	0.92		0.97	0.68	0.39
Control Delay	48.8	19.2	2.2	82.2	46.2	11.4	29.4	69.2		65.2	35.9	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	48.8	19.2	2.2	82.2	46.2	11.4	29.4	69.2		65.2	35.9	6.6
LOS	D	B	A	F	D	B	C	E		E	D	A
Approach Delay		29.1			47.2			60.4			36.1	
Approach LOS		C			D			E			D	
Queue Length 50th (ft)	163	103	0	144	216	21	61	~340		152	214	26
Queue Length 95th (ft)	#303	130	18	m#243	260	m63	110	#598		m#173	m240	m29
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	380	1772	795	238	980	590	289	479		253	508	612
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.89	0.25	0.10	0.76	0.59	0.27	0.43	0.92		0.97	0.68	0.39

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 41.7

Intersection LOS: D

Intersection Capacity Utilization 93.2%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

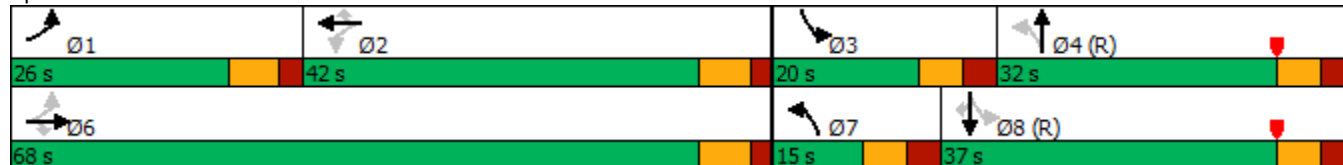
Queue shown is maximum after two cycles.

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230



HCM 6th Signalized Intersection Summary 17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	327	434	80	176	558	155	120	333	96	239	334	233
Future Volume (veh/h)	327	434	80	176	558	155	120	333	96	239	334	233
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	337	447	52	181	575	0	124	343	98	246	344	169
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	382	1414	635	219	642		410	531	152	379	621	526
Arrive On Green	0.17	0.41	0.41	0.38	0.38	0.00	0.07	0.33	0.32	0.16	0.50	0.50
Sat Flow, veh/h	1736	3464	1557	829	3356	1544	1880	1612	461	1616	1655	1402
Grp Volume(v), veh/h	337	447	52	181	575	0	124	0	441	246	344	169
Grp Sat Flow(s),veh/h/ln	1736	1732	1557	829	1678	1544	1880	0	2073	1616	1655	1402
Q Serve(g_s), s	17.8	10.5	2.5	23.0	19.3	0.0	5.1	0.0	21.8	11.8	17.3	8.6
Cycle Q Clear(g_c), s	17.8	10.5	2.5	23.0	19.3	0.0	5.1	0.0	21.8	11.8	17.3	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	382	1414	635	219	642		410	0	683	379	621	526
V/C Ratio(X)	0.88	0.32	0.08	0.83	0.89		0.30	0.00	0.65	0.65	0.55	0.32
Avail Cap(c_a), veh/h	382	1804	811	312	1021		418	0	683	379	621	526
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)	1.00	1.00	1.00	1.00	1.00	0.00	0.85	0.00	0.85	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	24.1	21.7	38.4	35.9	0.0	23.8	0.0	34.4	22.6	23.1	20.9
Incr Delay (d2), s/veh	20.9	0.0	0.0	8.1	4.3	0.0	0.4	0.0	4.0	3.8	3.5	1.6
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(95%),veh/ln	14.3	7.5	1.6	8.4	10.4	0.0	4.2	0.0	17.0	7.8	10.6	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.8	24.2	21.8	46.6	40.2	0.0	24.1	0.0	38.4	26.4	26.6	22.5
LnGrp LOS	D	C	C	D	D		C	A	D	C	C	C
Approach Vol, veh/h	836			756			565			759		
Approach Delay, s/veh	35.1			41.7			35.2			25.6		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	26.0	28.5	20.0	45.5		54.5	14.5	51.0				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	19.5	35.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	20.3	21.8	14.3	23.8		13.0	7.6	19.8				
Green Ext Time (p_c), s	0.0	0.2	0.0	0.3		0.3	0.0	2.0				

Intersection Summary

HCM 6th Ctrl Delay	34.4
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	477	74	190	561	151	92	207	133	141	160	149
Future Volume (vph)	348	477	74	190	561	151	92	207	133	141	160	149
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	3437	1435	1527	3289	1592	1736	1784	0	1558	1624	1499
Flt Permitted	0.226			0.475			0.654			0.261		
Satd. Flow (perm)	374	3437	1435	763	3289	1592	1195	1784	0	428	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		39				247
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1025			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	355	487	76	194	572	154	94	347	0	144	163	152
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	20.0		14.0	20.0	20.0
Total Split (s)	15.5	39.5	39.5	24.0	24.0	24.0	14.0	21.5		14.0	21.5	21.5
Total Split (%)	20.7%	52.7%	52.7%	32.0%	32.0%	32.0%	18.7%	28.7%		18.7%	28.7%	28.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	34.0	34.0	34.0	18.5	18.5	18.5	22.9	15.2		24.3	18.0	18.0
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.31	0.20		0.33	0.24	0.24
v/c Ratio	1.07	0.31	0.10	1.03	0.70	0.26	0.22	0.88		0.56	0.42	0.28
Control Delay	91.2	13.7	0.3	105.8	31.0	1.3	16.4	51.2		24.7	29.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	91.2	13.7	0.3	105.8	31.0	1.3	16.4	51.2		24.7	29.6	1.7
LOS	F	B	A	F	C	A	B	D		C	C	A
Approach Delay		42.5			41.8			43.8			18.9	
Approach LOS		D			D			D			B	
Queue Length 50th (ft)	~125	72	0	~99	127	0	27	140		44	67	0
Queue Length 95th (ft)	#286	105	0	#221	183	4	56	#286		83	125	6
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	331	1566	741	189	815	586	429	401		260	391	548
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.07	0.31	0.10	1.03	0.70	0.26	0.22	0.87		0.55	0.42	0.28

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 74.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 38.5

Intersection LOS: D

Intersection Capacity Utilization 84.2%

ICU Level of Service E

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15.5 s	24 s	14 s	21.5 s
 Ø6	 Ø7	 Ø8	
39.5 s	14 s	21.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2028 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	348	477	74	190	561	151	92	207	133	141	160	149
Future Volume (veh/h)	348	477	74	190	561	151	92	207	133	141	160	149
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	355	487	70	194	572	0	94	211	133	144	163	70
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	396	1490	665	265	691		474	260	164	331	404	357
Arrive On Green	0.14	0.43	0.43	0.41	0.41	0.00	0.07	0.21	0.19	0.11	0.25	0.25
Sat Flow, veh/h	1723	3491	1557	792	3409	1557	2069	1253	790	1576	1641	1450
Grp Volume(v), veh/h	355	487	70	194	572	0	94	0	344	144	163	70
Grp Sat Flow(s),veh/h/ln	1723	1745	1557	792	1705	1557	2069	0	2043	1576	1641	1450
Q Serve(g_s), s	10.0	6.4	1.9	14.0	10.4	0.0	2.4	0.0	11.1	4.7	5.8	2.6
Cycle Q Clear(g_c), s	10.0	6.4	1.9	14.0	10.4	0.0	2.4	0.0	11.1	4.7	5.8	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	396	1490	665	265	691		474	0	424	331	404	357
V/C Ratio(X)	0.90	0.33	0.11	0.73	0.83		0.20	0.00	0.81	0.44	0.40	0.20
Avail Cap(c_a), veh/h	396	1717	766	316	912		561	0	458	336	404	357
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	13.2	11.9	21.8	19.5	0.0	18.8	0.0	26.3	18.6	21.8	20.6
Incr Delay (d2), s/veh	22.3	0.0	0.0	5.2	3.7	0.0	0.2	0.0	9.9	0.9	0.7	0.3
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(95%),veh/ln	10.2	3.8	1.0	4.4	5.8	0.0	2.0	0.0	10.6	2.9	3.8	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.6	13.2	11.9	27.0	23.2	0.0	19.0	0.0	36.2	19.5	22.5	20.9
LnGrp LOS	D	B	B	C	C		B	A	D	B	C	C
Approach Vol, veh/h	912		766				438		377			
Approach Delay, s/veh	24.2		24.2				32.5		21.0			
Approach LOS	C		C				C		C			
Timer - Assigned Phs	1	2	3	4	6		7	8				
Phs Duration (G+Y+Rc), s	15.5	19.5	13.8	20.4	35.0		11.1	23.0				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0	6.5		7.0	7.0				
Max Green Setting (Gmax), s	9.0	17.5	7.0	14.5	33.0		7.0	14.5				
Max Q Clear Time (g_c+I1), s	12.5	12.9	7.2	13.1	8.9		4.9	8.3				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.2	0.3		0.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	23	34	6	44	124	47	356	9	33	221	79
Future Volume (vph)	71	23	34	6	44	124	47	356	9	33	221	79
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1232	0	0	1456	0	0	1578	0	0	1447	0
Flt Permitted		0.798			0.985			0.930			0.936	
Satd. Flow (perm)	0	1010	0	0	1437	0	0	1476	0	0	1361	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		30			129			3			41	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	181	0	0	429	0	0	346	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	22.0	22.0		22.0	22.0		38.0	38.0		38.0	38.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		11.0			11.0			23.4			23.4	
Actuated g/C Ratio		0.27			0.27			0.58			0.58	
v/c Ratio		0.45			0.37			0.50			0.43	
Control Delay		16.8			8.0			10.4			8.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.8			8.0			10.4			8.7	
LOS		B			A			B			A	
Approach Delay		16.8			8.0			10.4			8.7	
Approach LOS		B			A			B			A	
Queue Length 50th (ft)		17			8			61			40	
Queue Length 95th (ft)		71			53			158			114	
Internal Link Dist (ft)		1077			1324			919			946	
Turn Bay Length (ft)												
Base Capacity (vph)		469			715			1235			1145	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.28			0.25			0.35			0.30	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 40.3

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 62.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
38 s	22 s
 Ø6	 Ø8
38 s	22 s

HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	23	34	6	44	124	47	356	9	33	221	79
Future Volume (veh/h)	71	23	34	6	44	124	47	356	9	33	221	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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	74	24	35	6	46	129	49	371	9	34	230	82
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	371	91	89	146	91	240	192	592	14	181	478	159
Arrive On Green	0.18	0.22	0.18	0.18	0.22	0.18	0.37	0.40	0.37	0.37	0.40	0.37
Sat Flow, veh/h	729	412	407	27	413	1091	101	1467	34	81	1183	393
Grp Volume(v), veh/h	133	0	0	181	0	0	429	0	0	346	0	0
Grp Sat Flow(s),veh/h/ln	1548	0	0	1531	0	0	1601	0	0	1656	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	2.9	0.0	0.0	5.8	0.0	0.0	4.2	0.0	0.0
Prop In Lane	0.56		0.26	0.03		0.71	0.11		0.02	0.10		0.24
Lane Grp Cap(c), veh/h	493	0	0	419	0	0	737	0	0	755	0	0
V/C Ratio(X)	0.27	0.00	0.00	0.43	0.00	0.00	0.58	0.00	0.00	0.46	0.00	0.00
Avail Cap(c_a), veh/h	1042	0	0	1059	0	0	2032	0	0	2074	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.2	0.0	0.0	9.5	0.0	0.0	6.5	0.0	0.0	6.1	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.0	0.0	0.7	0.0	0.0	0.4	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(95%),veh/ln	0.9	0.0	0.0	1.3	0.0	0.0	2.4	0.0	0.0	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.4	0.0	0.0	10.2	0.0	0.0	7.2	0.0	0.0	6.5	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		133			181			429			346	
Approach Delay, s/veh		9.4			10.2			7.2			6.5	
Approach LOS		A			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.7		10.8		15.7		10.8				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		32.0		16.0		32.0		16.0				
Max Q Clear Time (g_c+I1), s		7.8		3.8		6.2		4.9				
Green Ext Time (p_c), s		1.9		0.3		1.5		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				7.8								
HCM 6th LOS				A								

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	83	78	4	52	80	33	375	6	111	426	65
Future Volume (vph)	94	83	78	4	52	80	33	375	6	111	426	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1309	0	0	1479	0	0	1586	0	0	1489	0
Flt Permitted		0.847			0.988			0.931			0.846	
Satd. Flow (perm)	0	1129	0	0	1463	0	0	1482	0	0	1271	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		35			83			2			17	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	0	141	0	0	431	0	0	628	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		14.5			14.5			32.5			32.5	
Actuated g/C Ratio		0.25			0.25			0.57			0.57	
v/c Ratio		0.85			0.33			0.51			0.86	
Control Delay		46.2			11.3			10.0			25.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		46.2			11.3			10.0			25.0	
LOS		D			B			B			C	
Approach Delay		46.2			11.3			10.0			25.0	
Approach LOS		D			B			B			C	
Queue Length 50th (ft)		80			16			80			158	
Queue Length 95th (ft)		#203			56			143			#372	
Internal Link Dist (ft)		1066			1154			917			948	
Turn Bay Length (ft)												
Base Capacity (vph)		324			447			914			790	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.82			0.32			0.47			0.79	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 57

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 23.1

Intersection LOS: C

Intersection Capacity Utilization 97.5%

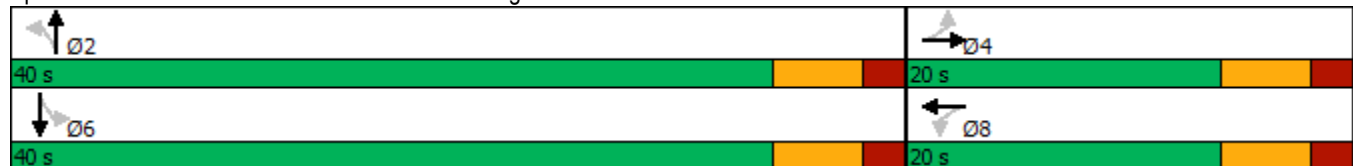
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave



HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	83	78	4	52	80	33	375	6	111	426	65
Future Volume (veh/h)	94	83	78	4	52	80	33	375	6	111	426	65
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	98	86	81	4	54	83	34	391	6	116	444	68
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	241	150	115	100	157	230	131	765	11	214	595	85
Arrive On Green	0.22	0.25	0.22	0.22	0.25	0.22	0.47	0.49	0.47	0.47	0.49	0.47
Sat Flow, veh/h	453	604	465	16	633	928	60	1556	23	210	1210	172
Grp Volume(v), veh/h	265	0	0	141	0	0	431	0	0	628	0	0
Grp Sat Flow(s),veh/h/ln	1522	0	0	1576	0	0	1639	0	0	1592	0	0
Q Serve(g_s), s	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0
Cycle Q Clear(g_c), s	6.1	0.0	0.0	2.9	0.0	0.0	6.9	0.0	0.0	12.7	0.0	0.0
Prop In Lane	0.37		0.31	0.03		0.59	0.08		0.01	0.18		0.11
Lane Grp Cap(c), veh/h	466	0	0	446	0	0	864	0	0	853	0	0
V/C Ratio(X)	0.57	0.00	0.00	0.32	0.00	0.00	0.50	0.00	0.00	0.74	0.00	0.00
Avail Cap(c_a), veh/h	670	0	0	668	0	0	1514	0	0	1482	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.3	0.0	0.0	12.2	0.0	0.0	6.7	0.0	0.0	8.1	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	1.3	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(95%),veh/ln	3.3	0.0	0.0	1.6	0.0	0.0	3.3	0.0	0.0	6.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	0.0	0.0	12.6	0.0	0.0	7.2	0.0	0.0	9.4	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		265			141			431			628	
Approach Delay, s/veh		14.4			12.6			7.2			9.4	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.9		14.5		23.9		14.5				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		34.0		14.0		34.0		14.0				
Max Q Clear Time (g_c+I1), s		8.9		8.1		14.7		4.9				
Green Ext Time (p_c), s		1.9		0.5		3.2		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				10.0								
HCM 6th LOS				A								

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	50	33	16	33	84	20	297	7	58	291	56
Future Volume (vph)	61	50	33	16	33	84	20	297	7	58	291	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1583	0	0	1524	0	0	1685	0	0	1750	0
Flt Permitted		0.808			0.936			0.962			0.909	
Satd. Flow (perm)	0	1306	0	0	1435	0	0	1626	0	0	1602	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			88			3			22	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	139	0	0	337	0	0	421	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	21.0	21.0		21.0	21.0		39.0	39.0		39.0	39.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		10.2			10.2			21.2			21.2	
Actuated g/C Ratio		0.27			0.27			0.57			0.57	
v/c Ratio		0.40			0.31			0.36			0.46	
Control Delay		14.3			7.9			8.5			9.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.3			7.9			8.5			9.2	
LOS		B			A			A			A	
Approach Delay		14.3			7.9			8.5			9.2	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		19			7			40			51	
Queue Length 95th (ft)		68			43			107			136	
Internal Link Dist (ft)		930			1052			920			945	
Turn Bay Length (ft)												
Base Capacity (vph)		595			689			1459			1439	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.25			0.20			0.23			0.29	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 37.4

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 9.5

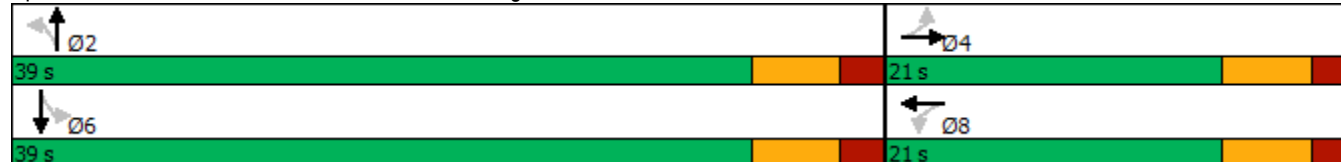
Intersection LOS: A

Intersection Capacity Utilization 63.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 29: Colebrook Rd & Harrisburg Ave



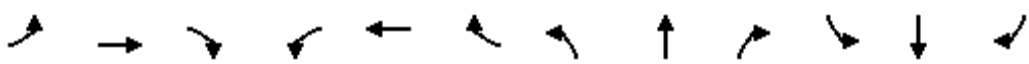
HCM 6th Signalized Intersection Summary
29: Colebrook Rd & Harrisburg Ave

2028 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	50	33	16	33	84	20	297	7	58	291	56
Future Volume (veh/h)	61	50	33	16	33	84	20	297	7	58	291	56
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	1724	1780	1837	1837	1795	1837	1724	1766	1794	1986	1958	1858
Adj Flow Rate, veh/h	64	52	34	17	34	88	21	309	7	60	303	58
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	8	4	0	0	3	0	5	2	0	0	2	9
Cap, veh/h	337	115	70	197	87	200	178	636	14	232	546	97
Arrive On Green	0.15	0.19	0.15	0.15	0.19	0.15	0.35	0.39	0.35	0.35	0.39	0.35
Sat Flow, veh/h	634	591	359	148	448	1028	48	1636	36	155	1404	249
Grp Volume(v), veh/h	150	0	0	139	0	0	337	0	0	421	0	0
Grp Sat Flow(s),veh/h/ln	1584	0	0	1623	0	0	1720	0	0	1808	0	0
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Cycle Q Clear(g_c), s	1.9	0.0	0.0	1.8	0.0	0.0	3.6	0.0	0.0	4.4	0.0	0.0
Prop In Lane	0.43		0.23	0.12		0.63	0.06		0.02	0.14		0.14
Lane Grp Cap(c), veh/h	456	0	0	416	0	0	757	0	0	799	0	0
V/C Ratio(X)	0.33	0.00	0.00	0.33	0.00	0.00	0.45	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	1133	0	0	1144	0	0	2478	0	0	2577	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.8	0.0	0.0	8.9	0.0	0.0	5.6	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.5	0.0	0.0	0.4	0.0	0.0	0.5	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(95%),veh/ln	0.9	0.0	0.0	0.8	0.0	0.0	1.4	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	0.0	0.0	9.3	0.0	0.0	6.0	0.0	0.0	6.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		150			139			337			421	
Approach Delay, s/veh		9.3			9.3			6.0			6.5	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.3		9.7		14.3		9.7				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		33.0		15.0		33.0		15.0				
Max Q Clear Time (g_c+I1), s		5.6		3.9		6.4		3.8				
Green Ext Time (p_c), s		1.4		0.4		1.9		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				7.1								
HCM 6th LOS				A								

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	35	2	876	7	63	712	7
Future Volume (vph)	36	0	17	17	1	35	2	876	7	63	712	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	75		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1631	0	1129	1562	0	1727	1612	1648
Flt Permitted		0.962			0.876		0.339			0.254		
Satd. Flow (perm)	0	1674	1581	0	1452	0	403	1562	0	462	1612	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		36			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	55	0	2	920	0	66	742	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		0.0	-1.0		0.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		6.0	5.0		6.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		8.8	8.8		8.6		57.7	58.3		57.7	58.3	58.3
Actuated g/C Ratio		0.13	0.13		0.12		0.82	0.83		0.82	0.83	0.83
v/c Ratio		0.18	0.08		0.26		0.01	0.71		0.17	0.55	0.01
Control Delay		28.5	2.8		17.0		3.5	10.1		8.6	10.6	0.7
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		28.5	2.8		17.0		3.5	10.1		8.6	10.6	0.7
LOS		C	A		B		A	B		A	B	A
Approach Delay		20.2			17.0			10.1			10.3	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		15	0		7		0	189		16	252	0
Queue Length 95th (ft)		39	5		36		2	#556		m24	m324	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				75			225		100
Base Capacity (vph)		298	320		288		332	1301		381	1342	1379
Starvation Cap Reductn		0	0		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		0.13	0.06		0.19		0.01	0.71		0.17	0.55	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 10.7

Intersection LOS: B

Intersection Capacity Utilization 73.2%

ICU Level of Service D

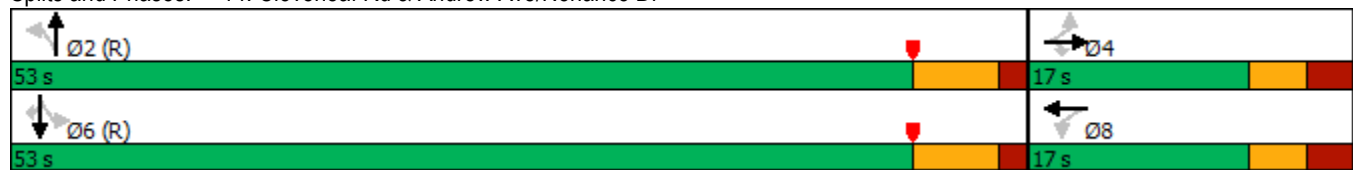
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



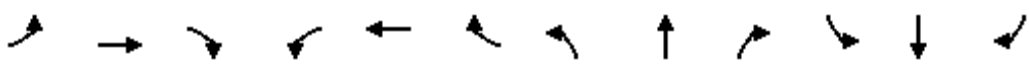
HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	35	2	876	7	63	712	7
Future Volume (veh/h)	36	0	17	17	1	35	2	876	7	63	712	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	36	2	912	7	66	742	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	227	0	124	94	10	69	419	1276	10	406	1373	1299
Arrive On Green	0.06	0.00	0.08	0.06	0.08	0.06	0.77	0.79	0.77	1.00	1.00	1.00
Sat Flow, veh/h	1585	0	1586	333	131	879	410	1623	12	609	1747	1652
Grp Volume(v), veh/h	38	0	18	55	0	0	2	0	919	66	742	7
Grp Sat Flow(s),veh/h/ln	1585	0	1586	1344	0	0	410	0	1635	609	1747	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.5	0.0	0.0	0.1	0.0	19.2	3.1	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.7	3.0	0.0	0.0	0.1	0.0	19.2	22.4	0.0	0.0
Prop In Lane	1.00		1.00	0.33		0.65	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	204	0	124	154	0	0	419	0	1285	406	1373	1299
V/C Ratio(X)	0.19	0.00	0.15	0.36	0.00	0.00	0.00	0.00	0.71	0.16	0.54	0.01
Avail Cap(c_a), veh/h	337	0	283	307	0	0	419	0	1285	406	1373	1299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.39	0.39	0.39
Uniform Delay (d), s/veh	30.9	0.0	30.1	31.6	0.0	0.0	1.8	0.0	3.7	4.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.4	0.0	0.0	0.0	0.0	3.4	0.3	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(95%),veh/ln	1.1	0.0	0.5	1.7	0.0	0.0	0.0	0.0	5.3	0.4	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	30.6	33.0	0.0	0.0	1.9	0.0	7.1	4.3	0.6	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56		55			921			815			
Approach Delay, s/veh	31.1		33.0			7.1			0.9			
Approach LOS	C		C			A			A			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	60.0		10.0		60.0		10.0					
Change Period (Y+Rc), s	6.0		5.5		6.0		5.5					
Max Green Setting (Gmax), s	47.0		11.5		47.0		11.5					
Max Q Clear Time (g_c+I1), s	21.2		3.5		24.4		5.0					
Green Ext Time (p_c), s	21.4		0.1		16.9		0.1					
Intersection Summary												
HCM 6th Ctrl Delay			5.8									
HCM 6th LOS			A									

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	62	0	208	17	882	5	129	1131	35
Future Volume (vph)	15	0	18	62	0	208	17	882	5	129	1131	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	150		0	0		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1611	0	1693	1639	0	1727	1723	1648
Flt Permitted		0.421			0.916		0.100			0.197		
Satd. Flow (perm)	0	733	1581	0	1492	0	178	1639	0	358	1723	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		175			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	284	0	18	933	0	136	1191	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		0.0	-1.0		0.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		6.0	5.0		6.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		9.5	9.5		9.5		40.0	41.0		40.0	41.0	41.0
Actuated g/C Ratio		0.16	0.16		0.16		0.67	0.68		0.67	0.68	0.68
v/c Ratio		0.14	0.06		0.74		0.15	0.83		0.57	1.01	0.03
Control Delay		24.1	1.6		23.5		6.8	15.5		5.3	20.4	0.1
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		24.1	1.6		23.5		6.8	15.5		5.3	20.4	0.1
LOS		C	A		C		A	B		A	C	A
Approach Delay		11.9			23.5			15.4			18.3	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		5	0		36		3	272		4	~512	0
Queue Length 95th (ft)		20	4		#133		m7	m367		m5	m43	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				150					100
Base Capacity (vph)		128	322		405		118	1121		238	1177	1140
Starvation Cap Reductn		0	0		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		0.13	0.06		0.70		0.15	0.83		0.57	1.01	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 17.7

Intersection LOS: B

Intersection Capacity Utilization 109.6%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

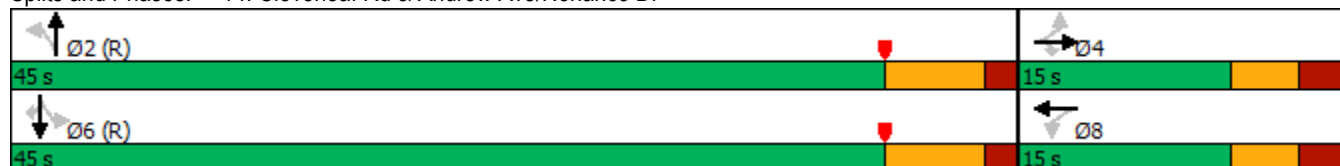
Queue shown is maximum after two cycles.

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	62	0	208	17	882	5	129	1131	35
Future Volume (veh/h)	15	0	18	62	0	208	17	882	5	129	1131	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	65	0	204	18	928	5	136	1191	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	267	0	278	127	14	207	401	1131	6	374	1231	1101
Arrive On Green	0.16	0.00	0.17	0.16	0.00	0.16	0.86	0.89	0.86	1.00	1.00	1.00
Sat Flow, veh/h	840	0	1586	300	77	1184	432	1697	9	601	1846	1652
Grp Volume(v), veh/h	16	0	11	269	0	0	18	0	933	136	1191	36
Grp Sat Flow(s),veh/h/ln	840	0	1586	1562	0	0	432	0	1706	601	1846	1652
Q Serve(g_s), s	0.0	0.0	0.3	7.7	0.0	0.0	0.4	0.0	13.7	7.3	0.0	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.3	9.5	0.0	0.0	0.4	0.0	13.7	20.9	0.0	0.0
Prop In Lane	1.00		1.00	0.24		0.76	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	253	0	278	322	0	0	401	0	1137	374	1231	1101
V/C Ratio(X)	0.06	0.00	0.04	0.84	0.00	0.00	0.04	0.00	0.82	0.36	0.97	0.03
Avail Cap(c_a), veh/h	253	0	278	322	0	0	401	0	1137	374	1231	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	21.2	0.0	20.6	25.2	0.0	0.0	1.4	0.0	1.9	3.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	17.2	0.0	0.0	0.2	0.0	6.7	0.2	3.2	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(95%),veh/ln	0.4	0.0	0.2	9.1	0.0	0.0	0.1	0.0	5.4	0.3	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	20.6	42.4	0.0	0.0	1.7	0.0	8.6	3.9	3.2	0.0
LnGrp LOS	C	A	C	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h	27			269			951			1363		
Approach Delay, s/veh	21.1			42.4			8.5			3.2		
Approach LOS	C			D			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			15.0			45.0			15.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	15.7			3.0			22.9			11.5		
Green Ext Time (p_c), s	19.9			0.0			15.7			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	9.3											
HCM 6th LOS	A											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	12	24	0	149	16	840	7	163	889	7
Future Volume (vph)	5	1	12	24	0	149	16	840	7	163	889	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	75		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1596	0	1693	1671	0	1727	1723	1648
Flt Permitted		0.708			0.950		0.208			0.232		
Satd. Flow (perm)	0	1232	1581	0	1527	0	371	1671	0	422	1723	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		157			1				45
Link Speed (mph)		25			25			40				40
Link Distance (ft)		750			1000			600				1240
Travel Time (s)		20.5			27.3			10.2				21.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	13	0	182	0	17	891	0	172	936	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		0.0	-1.0		0.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		6.0	5.0		6.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.4	8.4		8.4		41.1	42.1		41.1	42.1	42.1
Actuated g/C Ratio		0.14	0.14		0.14		0.68	0.70		0.68	0.70	0.70
v/c Ratio		0.03	0.05		0.52		0.07	0.76		0.60	0.78	0.01
Control Delay		21.2	0.3		11.9		4.7	12.6		11.9	10.1	0.0
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		21.2	0.3		11.9		4.7	12.6		11.9	10.1	0.0
LOS		C	A		B		A	B		B	B	A
Approach Delay		6.9			11.9			12.4			10.4	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)		2	0		8		2	148		2	10	0
Queue Length 95th (ft)		10	0		54		8	#469		m26	m414	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				75			225		100
Base Capacity (vph)		236	347		419		253	1171		288	1207	1168
Starvation Cap Reductn		0	0		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		0.03	0.04		0.43		0.07	0.76		0.60	0.78	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 11.3

Intersection LOS: B

Intersection Capacity Utilization 90.1%

ICU Level of Service E

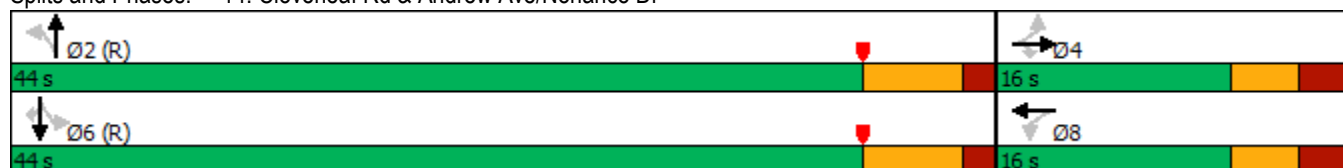
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2028 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	12	24	0	149	16	840	7	163	889	7
Future Volume (veh/h)	5	1	12	24	0	149	16	840	7	163	889	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	6	25	0	153	17	884	7	172	936	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	258	43	245	90	13	210	499	1182	9	332	1269	1135
Arrive On Green	0.14	0.15	0.15	0.14	0.00	0.14	0.67	0.69	0.67	1.00	1.00	1.00
Sat Flow, veh/h	956	278	1586	139	84	1362	565	1719	14	626	1846	1652
Grp Volume(v), veh/h	6	0	6	178	0	0	17	0	891	172	936	7
Grp Sat Flow(s),veh/h/ln	1234	0	1586	1584	0	0	565	0	1733	626	1846	1652
Q Serve(g_s), s	0.0	0.0	0.2	3.5	0.0	0.0	0.6	0.0	19.9	13.8	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	6.5	0.0	0.0	0.6	0.0	19.9	33.7	0.0	0.0
Prop In Lane	0.83		1.00	0.14		0.86	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	280	0	245	287	0	0	499	0	1191	332	1269	1135
V/C Ratio(X)	0.02	0.00	0.02	0.62	0.00	0.00	0.03	0.00	0.75	0.52	0.74	0.01
Avail Cap(c_a), veh/h	327	0	304	345	0	0	499	0	1191	332	1269	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.35	0.35	0.35
Uniform Delay (d), s/veh	21.9	0.0	21.5	24.6	0.0	0.0	3.4	0.0	6.0	8.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.4	0.0	0.0	0.1	0.0	4.3	2.0	1.4	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(95%),veh/ln	0.1	0.0	0.1	4.7	0.0	0.0	0.1	0.0	8.5	2.0	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	21.6	27.1	0.0	0.0	3.5	0.0	10.4	10.3	1.4	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	B	B	A	A
Approach Vol, veh/h	12			178			908			1115		
Approach Delay, s/veh	21.7			27.1			10.2			2.8		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	46.2			13.8			46.2			13.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	21.9			2.2			35.7			8.5		
Green Ext Time (p_c), s	13.9			0.0			2.2			0.1		
Intersection Summary												
HCM 6th Ctrl Delay				7.9								
HCM 6th LOS				A								

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	430	20	131	8	12	76	54	877	8	10	659	191
Future Volume (vph)	430	20	131	8	12	76	54	877	8	10	659	191
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1560	0	1391	1564	0	1500	1616	0	1628	1613	1486
Flt Permitted	0.694			0.651			0.202			0.110		
Satd. Flow (perm)	1172	1560	0	952	1564	0	319	1616	0	188	1613	1486
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		146			84			1				212
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	478	168	0	9	97	0	60	983	0	11	732	212
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	28.0	28.0		28.0	28.0		42.0	42.0		42.0	42.0	42.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	60.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)	23.0	23.0		23.0	23.0		36.5	36.5		36.5	36.5	35.5
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.52	0.52		0.52	0.52	0.51
v/c Ratio	1.24	0.28		0.03	0.17		0.36	1.17		0.11	0.87	0.25
Control Delay	154.6	5.9		16.4	6.4		13.7	103.6		11.9	28.6	2.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	154.6	5.9		16.4	6.4		13.7	103.6		11.9	28.6	2.3
LOS	F	A		B	A		B	F		B	C	A
Approach Delay		116.0			7.2			98.4			22.5	
Approach LOS		F			A			F			C	
Queue Length 50th (ft)	~262	6		3	4		8	~523		2	256	0
Queue Length 95th (ft)	#431	45		12	33		m15	#733		11	#482	29

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	385	610		312	570		166	843		98	841	858
Starvation Cap Reductn	0	0		0	0		0	0		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	1.24	0.28		0.03	0.17		0.36	1.17		0.11	0.87	0.25

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.24

Intersection Signal Delay: 72.7

Intersection LOS: E

Intersection Capacity Utilization 89.8%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

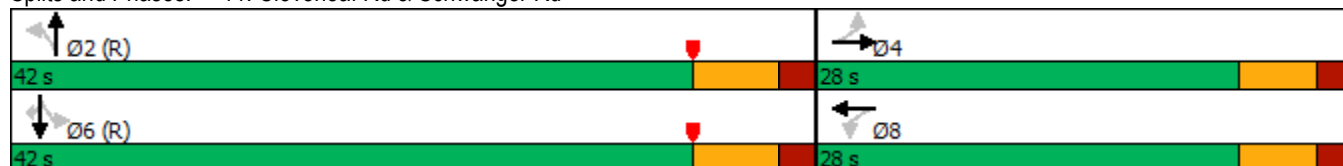
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	20	131	8	12	76	54	877	8	10	659	191
Future Volume (veh/h)	430	20	131	8	12	76	54	877	8	10	659	191
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	478	22	146	9	13	84	60	974	9	11	732	212
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	484	77	509	365	65	419	214	920	9	103	942	807
Arrive On Green	0.33	0.33	0.31	0.33	0.33	0.31	1.00	1.00	1.00	0.52	0.52	0.51
Sat Flow, veh/h	1358	234	1550	1019	197	1274	571	1765	16	597	1807	1591
Grp Volume(v), veh/h	478	0	168	9	0	97	60	0	983	11	732	212
Grp Sat Flow(s),veh/h/ln	1358	0	1784	1019	0	1471	571	0	1781	597	1807	1591
Q Serve(g_s), s	19.6	0.0	5.0	0.5	0.0	3.4	5.8	0.0	36.5	0.0	22.8	5.3
Cycle Q Clear(g_c), s	23.0	0.0	5.0	5.4	0.0	3.4	28.6	0.0	36.5	36.5	22.8	5.3
Prop In Lane	1.00		0.87	1.00		0.87	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	484	0	586	365	0	483	214	0	929	103	942	807
V/C Ratio(X)	0.99	0.00	0.29	0.02	0.00	0.20	0.28	0.00	1.06	0.11	0.78	0.26
Avail Cap(c_a), veh/h	484	0	586	365	0	483	214	0	929	103	942	807
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.64	0.00	0.64	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	0.0	17.8	19.5	0.0	17.2	8.9	0.0	0.0	35.0	13.5	9.8
Incr Delay (d2), s/veh	37.8	0.0	0.3	0.0	0.0	0.2	2.1	0.0	40.8	2.1	6.3	0.8
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(95%),veh/ln	18.8	0.0	3.5	0.2	0.0	1.9	1.0	0.0	15.4	0.4	13.9	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	0.0	18.0	19.5	0.0	17.4	11.0	0.0	40.8	37.1	19.7	10.6
LnGrp LOS	E	A	B	B	A	B	B	A	F	D	B	B
Approach Vol, veh/h	646			106			1043			955		
Approach Delay, s/veh	52.8			17.6			39.1			17.9		
Approach LOS	D			B			D			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	42.0			28.0			42.0			28.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	35.5			22.0			35.5			22.0		
Max Q Clear Time (g_c+I1), s	38.5			25.0			24.8			7.4		
Green Ext Time (p_c), s	0.0			0.0			9.1			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	34.1											
HCM 6th LOS	C											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	323	34	142	9	41	36	132	905	13	50	1144	447
Future Volume (vph)	323	34	142	9	41	36	132	905	13	50	1144	447
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1649	0	1416	1704	0	1620	1696	0	1628	1740	1545
Flt Permitted	0.704			0.614			0.107			0.140		
Satd. Flow (perm)	1200	1649	0	915	1704	0	182	1696	0	240	1740	1545
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			38			2				471
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	340	185	0	9	81	0	139	967	0	53	1204	471
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	43.0
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	71.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	36.5
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	0.61
v/c Ratio	1.42	0.47		0.05	0.22		1.23	0.91		0.35	1.11	0.42
Control Delay	235.8	16.5		20.3	14.2		161.9	23.1		13.5	77.6	1.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	235.8	16.5		20.3	14.2		161.9	23.1		13.5	77.6	1.9
LOS	F	B		C	B		F	C		B	E	A
Approach Delay		158.5			14.9			40.6			55.0	
Approach LOS		F			B			D			E	
Queue Length 50th (ft)	~171	31		3	13		~117	386		8	~514	0
Queue Length 95th (ft)	#310	82		13	44		m#160	#527		33	#730	28
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	240	397		183	371		113	1060		150	1087	1124
Starvation Cap Reductn	0	0		0	0		0	0		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	1.42	0.47		0.05	0.22		1.23	0.91		0.35	1.11	0.42

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.42

Intersection Signal Delay: 65.1

Intersection LOS: E

Intersection Capacity Utilization 112.4%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	323	34	142	9	41	36	132	905	13	50	1144	447
Future Volume (veh/h)	323	34	142	9	41	36	132	905	13	50	1144	447
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	340	36	125	9	43	24	139	953	13	53	1204	460
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	355	81	281	247	219	122	120	1141	16	251	1200	997
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.63	0.63	0.61	0.63	0.63	0.61
Sat Flow, veh/h	1407	405	1407	1045	1097	612	305	1826	25	606	1921	1640
Grp Volume(v), veh/h	340	0	161	9	0	67	139	0	966	53	1204	460
Grp Sat Flow(s),veh/h/ln	1407	0	1812	1045	0	1710	305	0	1850	606	1921	1640
Q Serve(g_s), s	10.0	0.0	4.7	0.5	0.0	2.0	0.0	0.0	24.6	4.5	37.5	9.2
Cycle Q Clear(g_c), s	12.0	0.0	4.7	5.2	0.0	2.0	37.5	0.0	24.6	29.1	37.5	9.2
Prop In Lane	1.00		0.78	1.00		0.36	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	355	0	362	247	0	342	120	0	1157	251	1200	997
V/C Ratio(X)	0.96	0.00	0.44	0.04	0.00	0.20	1.16	0.00	0.84	0.21	1.00	0.46
Avail Cap(c_a), veh/h	355	0	362	247	0	342	120	0	1157	251	1200	997
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.44	0.00	0.44	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	21.4	23.4	0.0	20.1	30.0	0.0	8.8	20.2	11.3	6.4
Incr Delay (d2), s/veh	36.5	0.0	0.9	0.1	0.0	0.3	104.2	0.0	3.3	1.9	26.7	1.5
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(95%),veh/ln	12.9	0.0	3.5	0.2	0.0	1.3	8.3	0.0	9.8	1.3	25.3	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	0.0	22.3	23.4	0.0	20.4	134.2	0.0	12.2	22.2	38.0	7.9
LnGrp LOS	E	A	C	C	A	C	F	A	B	C	F	A
Approach Vol, veh/h	501			76			1105			1717		
Approach Delay, s/veh	50.0			20.8			27.5			29.4		
Approach LOS	D			C			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	26.6			14.0			39.5			7.2		
Green Ext Time (p_c), s	9.1			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	31.6											
HCM 6th LOS	C											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	24	114	11	22	33	85	899	8	20	910	183
Future Volume (vph)	154	24	114	11	22	33	85	899	8	20	910	183
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1643	0	1572	1636	0	1620	1713	0	1550	1757	1561
Flt Permitted	0.719			0.665			0.134			0.136		
Satd. Flow (perm)	1226	1643	0	1100	1636	0	228	1713	0	222	1757	1561
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		120			35			1				193
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	145	0	12	58	0	89	954	0	21	958	193
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)	12.8	12.8		12.8	12.8		36.7	36.7		36.7	36.7	35.7
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.61	0.61		0.61	0.61	0.60
v/c Ratio	0.62	0.33		0.05	0.15		0.64	0.91		0.16	0.89	0.19
Control Delay	31.8	8.1		17.9	11.0		29.8	23.4		9.4	24.9	1.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	31.8	8.1		17.9	11.0		29.8	23.4		9.4	24.9	1.7
LOS	C	A		B	B		C	C		A	C	A
Approach Delay		20.6			12.2			23.9			20.8	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	52	7		3	7		23	341		3	272	0
Queue Length 95th (ft)	104	44		14	30		m45	#593		14	#554	22
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	306	500		275	435		139	1048		135	1074	1006
Starvation Cap Reductn	0	0		0	0		0	0		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	0.53	0.29		0.04	0.13		0.64	0.91		0.16	0.89	0.19

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 21.8

Intersection LOS: C

Intersection Capacity Utilization 89.6%

ICU Level of Service E

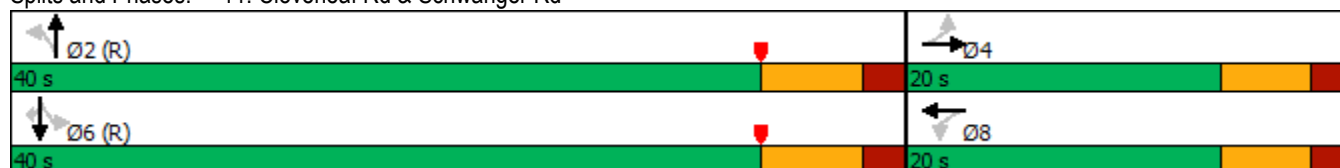
Analysis Period (min) 15

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2028 Build w/ Improvements

SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	24	114	11	22	33	85	899	8	20	910	183
Future Volume (veh/h)	154	24	114	11	22	33	85	899	8	20	910	183
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	162	25	93	12	23	21	89	946	7	21	958	159
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	353	71	263	271	161	147	269	1187	9	237	1240	1031
Arrive On Green	0.18	0.18	0.17	0.18	0.18	0.17	0.43	0.43	0.42	0.64	0.64	0.62
Sat Flow, veh/h	1436	383	1426	1192	876	800	516	1853	14	591	1935	1652
Grp Volume(v), veh/h	162	0	118	12	0	44	89	0	953	21	958	159
Grp Sat Flow(s),veh/h/ln	1436	0	1809	1192	0	1676	516	0	1867	591	1935	1652
Q Serve(g_s), s	6.4	0.0	3.5	0.5	0.0	1.3	9.5	0.0	26.6	1.8	21.1	2.4
Cycle Q Clear(g_c), s	7.7	0.0	3.5	4.0	0.0	1.3	30.6	0.0	26.6	28.3	21.1	2.4
Prop In Lane	1.00		0.79	1.00		0.48	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	353	0	333	271	0	309	269	0	1196	237	1240	1031
V/C Ratio(X)	0.46	0.00	0.35	0.04	0.00	0.14	0.33	0.00	0.80	0.09	0.77	0.15
Avail Cap(c_a), veh/h	447	0	452	349	0	419	269	0	1196	237	1240	1031
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.56	0.00	0.56	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	21.7	23.1	0.0	20.7	24.5	0.0	13.7	20.0	7.7	4.7
Incr Delay (d2), s/veh	0.9	0.0	0.6	0.1	0.0	0.2	1.8	0.0	3.2	0.7	4.7	0.3
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(95%),veh/ln	3.7	0.0	2.5	0.3	0.0	0.9	2.3	0.0	15.8	0.5	10.9	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	22.3	23.2	0.0	20.9	26.4	0.0	16.9	20.8	12.4	5.0
LnGrp LOS	C	A	C	C	A	C	C	A	B	C	B	A
Approach Vol, veh/h	280			56			1042			1138		
Approach Delay, s/veh	23.7			21.4			17.7			11.5		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.9			16.1			43.9			16.1		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	28.6			9.7			23.1			6.0		
Green Ext Time (p_c), s	4.6			0.4			9.7			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	15.7											
HCM 6th LOS	B											

APPENDIX L17

2033 NO BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 No Build
AM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	434	82	98	418	150	150
Future Volume (vph)	434	82	98	418	150	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1683	0	1662	1766	1534	0
Flt Permitted			0.223		0.976	
Satd. Flow (perm)	1683	0	390	1766	1534	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	16					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	573	0	109	464	334	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	31.4		42.2	41.0	18.6	
Actuated g/C Ratio	0.45		0.60	0.59	0.27	
v/c Ratio	0.75		0.29	0.45	0.82	
Control Delay	25.1		6.1	7.1	43.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	25.1		6.1	7.1	43.0	
LOS	C		A	A	D	
Approach Delay	25.1			6.9	43.0	
Approach LOS	C			A	D	
Queue Length 50th (ft)	205		14	66	134	
Queue Length 95th (ft)	#382		m26	93	#265	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	764		380	1034	411	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.75		0.29	0.45	0.81	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 22.1

Intersection LOS: C

Intersection Capacity Utilization 65.7%

ICU Level of Service C

Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230

↖ Ø1	→ Ø2 (R)	↖ Ø4
12 s	34 s	24 s
↖ Ø6 (R)		
46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 No Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	434	82	98	418	150	150
Future Volume (veh/h)	434	82	98	418	150	150
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	482	85	109	464	167	167
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	641	113	402	1164	201	201
Arrive On Green	0.47	0.46	0.15	1.00	0.25	0.23
Sat Flow, veh/h	1364	241	1846	1927	811	811
Grp Volume(v), veh/h	0	567	109	464	335	0
Grp Sat Flow(s),veh/h/ln	0	1604	1846	1927	1627	0
Q Serve(g_s), s	0.0	20.3	1.8	0.0	13.7	0.0
Cycle Q Clear(g_c), s	0.0	20.3	1.8	0.0	13.7	0.0
Prop In Lane		0.15	1.00		0.50	0.50
Lane Grp Cap(c), veh/h	0	754	402	1164	402	0
V/C Ratio(X)	0.00	0.75	0.27	0.40	0.83	0.00
Avail Cap(c_a), veh/h	0	754	471	1164	437	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	15.3	9.8	0.0	25.2	0.0
Incr Delay (d2), s/veh	0.0	6.8	0.4	1.0	16.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	12.4	1.0	0.6	11.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	22.1	10.2	1.0	41.7	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	567			573	335	
Approach Delay, s/veh	22.1			2.8	41.7	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.4	38.1		22.5		47.5
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.8	22.3		15.7		2.0
Green Ext Time (p_c), s	0.1	3.7		0.6		12.4
Intersection Summary						
HCM 6th Ctrl Delay			19.0			
HCM 6th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	596	1	0	561	49	0	0	2	59	0	89
Future Volume (vph)	45	596	1	0	561	49	0	0	2	59	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1614	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1614	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	671	0	0	685	0	0	2	0	66	100	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.1%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	596	1	0	561	49	0	0	2	59	0	89
Future Vol, veh/h	45	596	1	0	561	49	0	0	2	59	0	89
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	51	670	1	0	630	55	0	0	2	66	0	100

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	685	0	0	671	0	0	1482	1458	672	1433	1431	659
Stage 1	-	-	-	-	-	-	773	773	-	658	658	-
Stage 2	-	-	-	-	-	-	709	685	-	775	773	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	732	-	-	562	-	-	133	154	408	155	172	460
Stage 1	-	-	-	-	-	-	479	449	-	570	518	-
Stage 2	-	-	-	-	-	-	517	487	-	499	468	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	732	-	-	562	-	-	98	143	408	146	160	460
Mov Cap-2 Maneuver	-	-	-	-	-	-	98	143	-	146	160	-
Stage 1	-	-	-	-	-	-	445	418	-	530	518	-
Stage 2	-	-	-	-	-	-	404	487	-	461	435	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	13.9	28.4
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	408	732	-	-	562	-	-	146	460
HCM Lane V/C Ratio	0.006	0.069	-	-	-	-	-	0.454	0.217
HCM Control Delay (s)	13.9	10.3	-	-	0	-	-	48.7	15
HCM Lane LOS	B	B	-	-	A	-	-	E	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	2.1	0.8

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	519	46	65	495	6	107	2	75	4	3	2
Future Volume (vph)	3	519	46	65	495	6	107	2	75	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.458			0.308			0.754			0.702		
Satd. Flow (perm)	796	1667	1552	500	1558	1608	1302	1516	0	1302	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45		83			2	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	577	51	72	550	7	119	85	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	42.2	42.2	42.2	52.2	52.1	52.1	10.9	10.9		10.7	10.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.75	0.74	0.74	0.16	0.16		0.15	0.15	
v/c Ratio	0.01	0.57	0.05	0.15	0.47	0.01	0.59	0.28		0.02	0.02	
Control Delay	7.0	9.3	0.1	1.7	3.3	0.0	39.6	9.7		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	7.0	9.3	0.1	1.7	3.3	0.0	39.6	9.7		24.5	21.0	
LOS	A	A	A	A	A	A	D	A		C	C	
Approach Delay		8.5			3.1			27.1			22.6	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	1	90	0	8	68	0	47	1		1	1	
Queue Length 95th (ft)	m1	m124	m0	2	12	m0	97	35		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	479	1004	987	499	1158	1207	225	330		225	320	
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	0.01	0.57	0.05	0.14	0.47	0.01	0.53	0.26		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 8.9

Intersection LOS: A

Intersection Capacity Utilization 66.7%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	519	46	65	495	6	107	2	75	4	3	2
Future Volume (veh/h)	3	519	46	65	495	6	107	2	75	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	577	35	72	550	6	119	2	45	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	671	1178	1042	639	1161	1112	287	9	203	260	148	99
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.13	0.13	0.11	0.13	0.13	0.11
Sat Flow, veh/h	940	1947	1722	1640	1609	1542	1461	72	1615	1465	1176	784
Grp Volume(v), veh/h	3	577	35	72	550	6	119	0	47	4	0	5
Grp Sat Flow(s),veh/h/ln	940	1947	1722	1640	1609	1542	1461	0	1687	1465	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	5.4	0.0	1.8	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.0	0.0	0.0	5.4	0.0	1.8	1.4	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	671	1178	1042	639	1161	1112	287	0	212	260	0	246
V/C Ratio(X)	0.00	0.49	0.03	0.11	0.47	0.01	0.42	0.00	0.22	0.02	0.00	0.02
Avail Cap(c_a), veh/h	671	1178	1042	753	1161	1112	355	0	292	329	0	339
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)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.3	0.0	0.0	29.1	0.0	28.0	28.0	0.0	27.0
Incr Delay (d2), s/veh	0.0	1.5	0.1	0.1	1.3	0.0	1.0	0.0	0.5	0.0	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(95%),veh/ln	0.0	0.9	0.0	0.4	0.7	0.0	3.5	0.0	1.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.5	0.1	3.4	1.3	0.0	30.1	0.0	28.5	28.0	0.0	27.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	615		628			166			9			
Approach Delay, s/veh	1.4		1.5			29.6			27.4			
Approach LOS	A		A			C			C			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.2	48.1	13.7		56.3		13.7					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.5	2.5	3.9		2.5		7.9					
Green Ext Time (p_c), s	0.0	0.7	0.0		0.6		0.1					

Intersection Summary

HCM 6th Ctrl Delay	4.9
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	443	14	5	532	13	10	0	15	6	0	9
Future Volume (vph)	27	443	14	5	532	13	10	0	15	6	0	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1659	0	1744	1654	1445	0	1731	0	1719	1501	0
Flt Permitted	0.373			0.484				0.863				
Satd. Flow (perm)	658	1659	0	889	1654	1415	0	1522	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				126		139			391	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	491	0	5	572	14	0	27	0	6	10	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.04	0.33		0.01	0.41	0.01		0.10		0.03	0.02	
Control Delay	0.9	2.4		3.8	5.0	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.9	2.4		3.8	5.0	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.3			4.9			0.7			10.8	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	67		m1	124	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	664	1492		743	1383	1204		324		242	540	
Starvation Cap Reductn	0	0		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	0.04	0.33		0.01	0.41	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 3.7

Intersection LOS: A

Intersection Capacity Utilization 46.1%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2033 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	443	14	5	532	13	10	0	15	6	0	9
Future Volume (veh/h)	27	443	14	5	532	13	10	0	15	6	0	9
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	0.98		0.99	0.99		0.99
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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	29	476	15	5	572	14	11	0	15	6	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	703	1282	40	783	1292	1120	91	0	24	163	0	61
Arrive On Green	0.07	1.00	1.00	1.00	1.00	1.00	0.03	0.00	0.03	0.04	0.00	0.03
Sat Flow, veh/h	1629	1568	49	943	1793	1554	452	0	616	1360	0	1539
Grp Volume(v), veh/h	29	0	491	5	572	14	26	0	0	6	0	1
Grp Sat Flow(s),veh/h/ln	1629	0	1618	943	1793	1554	1068	0	0	1360	0	1539
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.42		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	703	0	1323	783	1292	1120	100	0	0	163	0	61
V/C Ratio(X)	0.04	0.00	0.37	0.01	0.44	0.01	0.26	0.00	0.00	0.04	0.00	0.02
Avail Cap(c_a), veh/h	801	0	1323	783	1292	1120	241	0	0	292	0	207
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)	0.80	0.00	0.80	0.91	0.91	0.91	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	33.9	0.0	0.0	32.4	0.0	32.8
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.0	1.0	0.0	1.4	0.0	0.0	0.1	0.0	0.1
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(95%),veh/ln	0.0	0.0	0.4	0.0	0.6	0.0	0.9	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.6	0.0	1.0	0.0	35.2	0.0	0.0	32.5	0.0	32.9
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	C
Approach Vol, veh/h	520			591			26			7		
Approach Delay, s/veh	0.7			1.0			35.2			32.5		
Approach LOS	A			A			D			C		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.8	55.8		7.4		62.6		7.4				
Change Period (Y+Rc), s	5.5	6.4		5.6		6.4		5.6				
Max Green Setting (Gmax), s	5.5	38.6		8.4		49.6		8.4				
Max Q Clear Time (g_c+I1), s	2.8	2.5		2.7		2.5		3.7				
Green Ext Time (p_c), s	0.0	0.7		0.0		0.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				1.8								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	407	5	11	426	35	63	32	37	59	27	52
Future Volume (vph)	40	407	5	11	426	35	63	32	37	59	27	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1668	0	1246	1586	0	1248	1509	0	0	1835	0
Flt Permitted	0.453			0.487			0.643				0.828	
Satd. Flow (perm)	803	1668	0	639	1586	0	844	1509	0	0	1551	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			10			40			44	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	443	0	12	496	0	68	74	0	0	148	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	51.6	51.6		51.6	51.6		11.8	11.8			11.8	
Actuated g/C Ratio	0.74	0.74		0.74	0.74		0.17	0.17			0.17	
v/c Ratio	0.07	0.36		0.03	0.42		0.48	0.26			0.50	
Control Delay	1.1	1.5		5.0	6.7		36.3	15.1			23.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.5		5.0	6.7		36.3	15.1			23.4	
LOS	A	A		A	A		D	B			C	
Approach Delay		1.5			6.7			25.3			23.4	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	1	8		1	76		27	13			41	
Queue Length 95th (ft)	3	18		8	174		59	41			83	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	591	1229		470	1171		241	459			474	
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	0.07	0.36		0.03	0.42		0.28	0.16			0.31	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 8.7

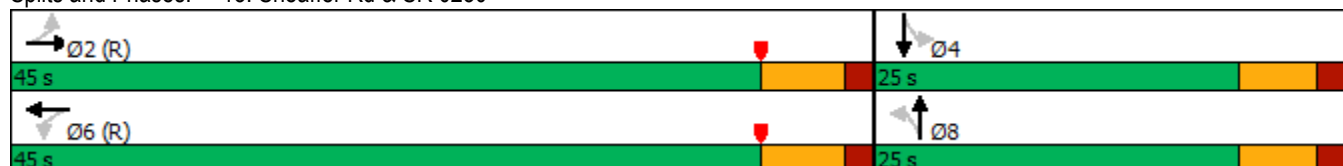
Intersection LOS: A

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2033 No Build
AM Peak Hour

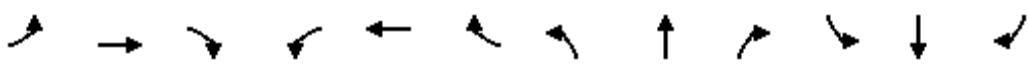
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	407	5	11	426	35	63	32	37	59	27	52
Future Volume (veh/h)	40	407	5	11	426	35	63	32	37	59	27	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	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			
Adj Sat Flow, veh/h/ln	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	43	438	4	12	458	37	68	34	18	63	29	38
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	627	1206	11	649	1210	98	234	139	73	156	61	58
Arrive On Green	1.00	1.00	1.00	0.73	0.73	0.71	0.13	0.13	0.12	0.12	0.13	0.12
Sat Flow, veh/h	844	1662	15	752	1668	135	986	1041	551	595	459	435
Grp Volume(v), veh/h	43	0	442	12	0	495	68	0	52	130	0	0
Grp Sat Flow(s),veh/h/ln	844	0	1677	752	0	1802	986	0	1592	1490	0	0
Q Serve(g_s), s	0.6	0.0	0.0	0.3	0.0	7.3	0.0	0.0	2.1	4.1	0.0	0.0
Cycle Q Clear(g_c), s	7.9	0.0	0.0	0.3	0.0	7.3	4.5	0.0	2.1	6.1	0.0	0.0
Prop In Lane	1.00		0.01	1.00		0.07	1.00		0.35	0.48		0.29
Lane Grp Cap(c), veh/h	627	0	1217	649	0	1307	234	0	212	253	0	0
V/C Ratio(X)	0.07	0.00	0.36	0.02	0.00	0.38	0.29	0.00	0.25	0.51	0.00	0.00
Avail Cap(c_a), veh/h	627	0	1217	649	0	1307	385	0	455	502	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)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.6	0.0	0.0	2.7	0.0	3.7	28.2	0.0	27.4	29.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.8	0.1	0.0	0.8	0.7	0.0	0.6	1.6	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	3.0	1.9	0.0	1.4	3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	0.0	0.8	2.7	0.0	4.5	28.9	0.0	27.9	31.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	485				507				120			
Approach Delay, s/veh	0.8				4.4				28.5			
Approach LOS	A				A				C			
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	55.7			14.3			55.7			14.3		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			8.1			9.3			6.5		
Green Ext Time (p_c), s	12.9			0.3			13.7			0.3		
Intersection Summary												
HCM 6th Ctrl Delay			8.1									
HCM 6th LOS			A									
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	356	0	92	580	158	0	0	202	59
Future Volume (vph)	0	0	0	356	0	92	580	158	0	0	202	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.456					
Satd. Flow (perm)	0	0	0	0	1546	1145	741	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	371	96	604	165	0	0	210	61
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.1	16.1	32.7	32.7			15.7	15.7
Actuated g/C Ratio					0.28	0.28	0.56	0.56			0.27	0.27
v/c Ratio					0.87	0.22	1.04	0.21			0.51	0.12
Control Delay					44.4	2.2	64.0	7.3			23.2	0.5
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					44.4	2.2	64.0	7.3			23.2	0.5
LOS					D	A	E	A			C	A
Approach Delay					35.8			51.8			18.1	
Approach LOS					D			D			B	
Queue Length 50th (ft)					127	0	~151	26			63	0
Queue Length 95th (ft)					#266	9	#416	52			119	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 No Build

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					438	441	580	831			445	554
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					0.85	0.22	1.04	0.20			0.47	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 40.8

Intersection LOS: D

Intersection Capacity Utilization 95.3%

ICU Level of Service F

Analysis Period (min) 15

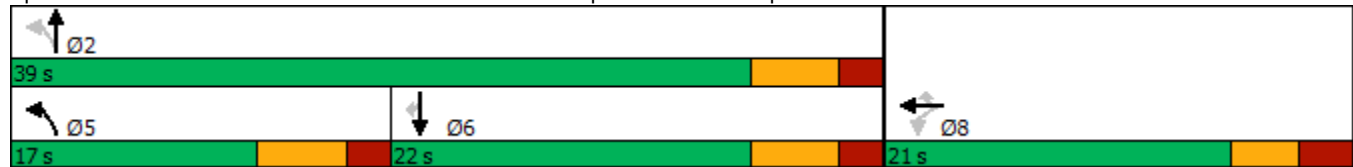
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	356	0	92	580	158	0	0	202	59
Future Volume (veh/h)	0	0	0	356	0	92	580	158	0	0	202	59
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				371	0	0	604	165	0	0	210	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				466	0		639	832	0	0	404	
Arrive On Green				0.24	0.00	0.00	0.22	0.56	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				371	0	0	604	165	0	0	210	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				10.4	0.0	0.0	12.0	2.9	0.0	0.0	5.9	0.0
Cycle Q Clear(g_c), s				10.4	0.0	0.0	12.0	2.9	0.0	0.0	5.9	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				466	0		639	832	0	0	404	
V/C Ratio(X)				0.80	0.00		0.95	0.20	0.00	0.00	0.52	
Avail Cap(c_a), veh/h				551	0		639	943	0	0	528	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.9	0.0	0.0	13.3	5.8	0.0	0.0	17.5	0.0
Incr Delay (d2), s/veh				6.8	0.0	0.0	23.1	0.4	0.0	0.0	3.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				8.5	0.0	0.0	12.6	1.2	0.0	0.0	4.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.8	0.0	0.0	36.4	6.2	0.0	0.0	21.2	0.0
LnGrp LOS				C	A		D	A	A	A	C	
Approach Vol, veh/h					371			769			210	
Approach Delay, s/veh					25.8			29.9			21.2	
Approach LOS					C			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		18.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		4.9			14.0	7.9		12.4				
Green Ext Time (p_c), s		3.6			0.0	2.1		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				27.4								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	2	263	0	0	0	0	705	633	112	437	0
Future Volume (vph)	33	2	263	0	0	0	0	705	633	112	437	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	37	280	0	0	0	0	1423	0	119	465	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 95.3% ICU Level of Service F

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2033 No Build
AM Peak Hour

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	33	2	263	0	0	0	0	705	633	112	437	0
Future Vol, veh/h	33	2	263	0	0	0	0	705	633	112	437	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	35	2	280	0	0	0	0	750	673	119	465	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1453	1453	465	-	0	0	750	0	0
Stage 1	703	703	-	-	-	-	-	-	-
Stage 2	750	750	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	136	168	634	0	-	-	685	-	0
Stage 1	588	498	-	0	-	-	-	-	0
Stage 2	561	478	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	112	0	634	-	-	-	685	-	-
Mov Cap-2 Maneuver	112	0	-	-	-	-	-	-	-
Stage 1	588	0	-	-	-	-	-	-	-
Stage 2	463	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.5	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	112	634	685	-
HCM Lane V/C Ratio	-	-	0.332	0.441	0.174	-
HCM Control Delay (s)	-	-	52.4	15.1	11.4	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	1.3	2.3	0.6	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 No Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	26	0	1319	692	5
Future Volume (vph)	6	26	0	1319	692	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1620	0	0	1734	1653	0
Flt Permitted	0.990					
Satd. Flow (perm)	1620	0	0	1734	1653	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	0	0	1466	775	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	79.4%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 No Build
AM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	26	0	1319	692	5
Future Vol, veh/h	6	26	0	1319	692	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	29	0	1466	769	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2238	772	775	0	-	0
Stage 1	772	-	-	-	-	-
Stage 2	1466	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	50	421	704	-	-	-
Stage 1	511	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	50	421	704	-	-	-
Mov Cap-2 Maneuver	50	-	-	-	-	-
Stage 1	511	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	30.6	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	704	-	176	-	-	
HCM Lane V/C Ratio	-	-	0.202	-	-	
HCM Control Delay (s)	0	-	30.6	-	-	
HCM Lane LOS	A	-	D	-	-	
HCM 95th %tile Q(veh)	0	-	0.7	-	-	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	440	20	114	9	13	78	42	802	9	11	525	195
Future Volume (vph)	440	20	114	9	13	78	42	802	9	11	525	195
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1565	0	1391	1565	0	1500	1614	0	1628	1567	0
Flt Permitted	0.692			0.662			0.190			0.121		
Satd. Flow (perm)	1168	1565	0	968	1565	0	300	1614	0	207	1567	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		127			87			1			44	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	489	149	0	10	101	0	47	901	0	12	800	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.47	0.28		0.04	0.20		0.28	0.99		0.10	0.89	
Control Delay	251.5	7.1		18.7	7.3		10.4	39.6		9.7	27.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	251.5	7.1		18.7	7.3		10.4	39.6		9.7	27.0	
LOS	F	A		B	A		B	D		A	C	
Approach Delay		194.4			8.3			38.2			26.7	
Approach LOS		F			A			D			C	
Queue Length 50th (ft)	~296	7		3	4		6	358		2	259	
Queue Length 95th (ft)	#466	46		13	37		m12	#616		11	#516	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	333	537		276	509		169	911		116	903	
Starvation Cap Reductn	0	0		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	1.47	0.28		0.04	0.20		0.28	0.99		0.10	0.89	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.47

Intersection Signal Delay: 72.9

Intersection LOS: E

Intersection Capacity Utilization 86.3%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

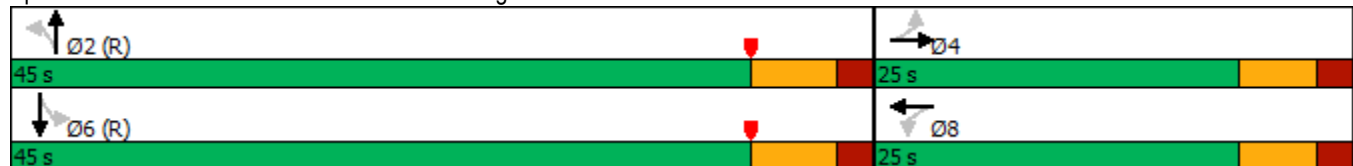
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary 11: Cloverleaf Rd & Schwanger Rd

2033 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	20	114	9	13	78	42	802	9	11	525	195
Future Volume (veh/h)	440	20	114	9	13	78	42	802	9	11	525	195
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	489	22	127	10	14	87	47	891	10	12	583	217
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	417	75	435	331	58	362	224	993	11	466	708	264
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1352	264	1524	1037	204	1268	653	1760	20	644	1255	467
Grp Volume(v), veh/h	489	0	149	10	0	101	47	0	901	12	0	800
Grp Sat Flow(s),veh/h/ln	1352	0	1788	1037	0	1472	653	0	1780	644	0	1723
Q Serve(g_s), s	16.3	0.0	4.6	0.5	0.0	3.7	3.9	0.0	0.0	0.6	0.0	26.5
Cycle Q Clear(g_c), s	20.0	0.0	4.6	5.1	0.0	3.7	30.4	0.0	0.0	0.6	0.0	26.5
Prop In Lane	1.00		0.85	1.00		0.86	1.00		0.01	1.00		0.27
Lane Grp Cap(c), veh/h	417	0	511	331	0	421	224	0	1005	466	0	972
V/C Ratio(X)	1.17	0.00	0.29	0.03	0.00	0.24	0.21	0.00	0.90	0.03	0.00	0.82
Avail Cap(c_a), veh/h	417	0	511	331	0	421	224	0	1005	466	0	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.70	0.00	0.70	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.9	0.0	19.8	21.5	0.0	19.5	10.2	0.0	0.0	6.8	0.0	12.5
Incr Delay (d2), s/veh	100.3	0.0	0.3	0.0	0.0	0.3	1.5	0.0	9.1	0.1	0.0	7.8
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(95%),veh/ln	27.9	0.0	3.3	0.2	0.0	2.2	0.9	0.0	4.6	0.1	0.0	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	129.2	0.0	20.1	21.5	0.0	19.8	11.7	0.0	9.1	6.9	0.0	20.4
LnGrp LOS	F	A	C	C	A	B	B	A	A	A	A	C
Approach Vol, veh/h	638			111			948			812		
Approach Delay, s/veh	103.7			20.0			9.2			20.2		
Approach LOS	F			B			A			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	2.0			22.0			28.5			7.1		
Green Ext Time (p_c), s	28.9			0.0			8.5			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	37.3											
HCM 6th LOS	D											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	10	2	815	7	26	599	7
Future Volume (vph)	36	0	17	17	1	10	2	815	7	26	599	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1681	0	0	1561	0	0	1615	1648
Flt Permitted		0.738			0.788			0.999			0.954	
Satd. Flow (perm)	0	1284	1581	0	1365	0	0	1559	0	0	1543	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		10			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	29	0	0	858	0	0	651	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.6			58.4			58.4	58.4
Actuated g/C Ratio		0.12	0.12		0.12			0.83			0.83	0.83
v/c Ratio		0.24	0.08		0.17			0.66			0.51	0.01
Control Delay		30.6	2.8		22.1			8.4			8.4	0.4
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		30.6	2.8		22.1			8.4			8.4	0.4
LOS		C	A		C			A			A	A
Approach Delay		21.6			22.1			8.4			8.3	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		15	0		7			160			189	0
Queue Length 95th (ft)		40	5		29			371			m258	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		229	320		251			1300			1286	1380
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		0.17	0.06		0.12			0.66			0.51	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 71.3%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

											
Ø2 (R)									Ø4		
53 s									17 s		
											
Ø6 (R)									Ø8		
53 s									17 s		

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	10	2	815	7	26	599	7
Future Volume (veh/h)	36	0	17	17	1	10	2	815	7	26	599	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	10	2	849	7	27	624	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	209	0	105	119	9	23	52	1293	11	78	1322	1319
Arrive On Green	0.05	0.00	0.07	0.05	0.07	0.05	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1598	0	1586	535	134	352	1	1620	13	31	1656	1652
Grp Volume(v), veh/h	38	0	18	29	0	0	858	0	0	651	0	7
Grp Sat Flow(s),veh/h/ln	1598	0	1586	1020	0	0	1634	0	0	1688	0	1652
Q Serve(g_s), s	0.0	0.0	0.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.8	2.5	0.0	0.0	15.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.62		0.34	0.00		0.01	0.04		1.00
Lane Grp Cap(c), veh/h	186	0	105	136	0	0	1333	0	0	1376	0	1319
V/C Ratio(X)	0.20	0.00	0.17	0.21	0.00	0.00	0.64	0.00	0.00	0.47	0.00	0.01
Avail Cap(c_a), veh/h	338	0	283	302	0	0	1333	0	0	1376	0	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.36	0.00	0.36
Uniform Delay (d), s/veh	31.7	0.0	30.9	32.4	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	0.8	0.0	0.0	2.4	0.0	0.0	0.4	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(95%),veh/ln	1.2	0.0	0.5	0.9	0.0	0.0	4.4	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	31.6	33.1	0.0	0.0	5.4	0.0	0.0	0.4	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56			29			858			658		
Approach Delay, s/veh	32.0			33.1			5.4			0.4		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	60.9			9.1			60.9			9.1		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	47.0			11.5			47.0			11.5		
Max Q Clear Time (g_c+I1), s	17.9			3.5			2.0			4.5		
Green Ext Time (p_c), s	22.5			0.1			23.3			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	4.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	231	50	3	194	212	79	385	12	120	252	217
Future Volume (vph)	277	231	50	3	194	212	79	385	12	120	252	217
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1716	0	1500	1509	1388
Flt Permitted	0.391			0.606			0.500			0.252		
Satd. Flow (perm)	611	1660	1088	760	1649	1561	862	1716	0	398	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		2				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	295	246	53	3	206	226	84	423	0	128	268	231
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	30.0	30.0	30.0	14.7	14.7	14.7	26.7	20.7		26.9	20.8	20.8
Actuated g/C Ratio	0.41	0.41	0.41	0.20	0.20	0.20	0.37	0.28		0.37	0.28	0.28
v/c Ratio	0.81	0.36	0.10	0.02	0.62	0.45	0.21	0.87		0.48	0.62	0.41
Control Delay	38.1	18.2	0.4	25.0	37.0	6.6	13.9	46.5		19.5	31.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	38.1	18.2	0.4	25.0	37.0	6.6	13.9	46.5		19.5	31.8	6.0
LOS	D	B	A	C	D	A	B	D		B	C	A
Approach Delay		26.5			21.1			41.1			19.8	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	105	82	0	1	92	0	21	185		33	108	0
Queue Length 95th (ft)	#232	139	0	8	159	48	50	#376		72	201	51

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	366	762	580	190	413	570	402	514		269	452	578
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.81	0.32	0.09	0.02	0.50	0.40	0.21	0.82		0.48	0.59	0.40

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 73

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 26.9

Intersection LOS: C

Intersection Capacity Utilization 75.3%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	277	231	50	3	194	212	79	385	12	120	252	217
Future Volume (veh/h)	277	231	50	3	194	212	79	385	12	120	252	217
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	295	246	40	3	206	0	84	410	11	128	268	201
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	407	684	482	247	321		372	499	13	309	433	383
Arrive On Green	0.14	0.40	0.40	0.19	0.19	0.00	0.07	0.25	0.23	0.10	0.28	0.28
Sat Flow, veh/h	1641	1709	1206	777	1724	1532	1988	2004	54	1522	1528	1352
Grp Volume(v), veh/h	295	246	40	3	206	0	84	0	421	128	268	201
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	777	1724	1532	1988	0	2057	1522	1528	1352
Q Serve(g_s), s	9.5	7.1	1.4	0.2	7.8	0.0	2.1	0.0	13.6	4.2	10.7	8.8
Cycle Q Clear(g_c), s	9.5	7.1	1.4	0.2	7.8	0.0	2.1	0.0	13.6	4.2	10.7	8.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	407	684	482	247	321		372	0	512	309	433	383
V/C Ratio(X)	0.73	0.36	0.08	0.01	0.64		0.23	0.00	0.82	0.41	0.62	0.53
Avail Cap(c_a), veh/h	407	803	567	302	442		464	0	630	328	468	414
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	14.8	13.1	23.3	26.4	0.0	17.6	0.0	24.9	17.6	21.9	21.2
Incr Delay (d2), s/veh	6.3	0.1	0.0	0.0	0.8	0.0	0.3	0.0	7.1	0.9	2.2	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(95%),veh/ln	7.1	4.2	0.6	0.1	5.3	0.0	1.7	0.0	11.8	2.5	6.7	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	14.9	13.1	23.3	27.2	0.0	17.9	0.0	32.0	18.5	24.1	22.3
LnGrp LOS	C	B	B	C	C		B	A	C	B	C	C
Approach Vol, veh/h	581			209			505			597		
Approach Delay, s/veh	20.1			27.1			29.7			22.3		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	13.1	23.5		33.6	10.8	25.9				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	10.3	6.7	15.6		9.6	4.6	13.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9		0.1	0.0	1.5				

Intersection Summary

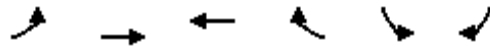
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2033 No Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	329	409	25	27	3
Future Volume (vph)	3	329	409	25	27	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1723	0	1557	0
Flt Permitted	0.950				0.957	
Satd. Flow (perm)	1318	1693	1723	0	1557	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	362	476	0	33	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 33.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	329	409	25	27	3
Future Vol, veh/h	3	329	409	25	27	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	362	449	27	30	3

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	476	0	0	831	463
Stage 1	-	-	-	463	-
Stage 2	-	-	-	368	-
Critical Hdwy	4.4	-	-	6.84	6.7
Critical Hdwy Stg 1	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	5.84	-
Follow-up Hdwy	3.3	-	-	3	3.4
Pot Cap-1 Maneuver	752	-	-	343	552
Stage 1	-	-	-	682	-
Stage 2	-	-	-	767	-
Platoon blocked, %	-	-	-		
Mov Cap-1 Maneuver	752	-	-	342	552
Mov Cap-2 Maneuver	-	-	-	484	-
Stage 1	-	-	-	679	-
Stage 2	-	-	-	767	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	752	-	-	-	490
HCM Lane V/C Ratio	0.004	-	-	-	0.067
HCM Control Delay (s)	9.8	-	-	-	12.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2033 No Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	23	35	6	45	116	48	327	10	27	200	76
Future Volume (vph)	65	23	35	6	45	116	48	327	10	27	200	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1307	0	0	1540	0	0	1665	0	0	1523	0
Flt Permitted		0.974			0.998			0.994			0.996	
Satd. Flow (perm)	0	1307	0	0	1540	0	0	1665	0	0	1523	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	128	0	0	174	0	0	401	0	0	315	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 56.7%	ICU Level of Service B											
Analysis Period (min) 15												

Intersection	
Intersection Delay, s/veh	15.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	65	23	35	6	45	116	48	327	10	27	200	76
Future Vol, veh/h	65	23	35	6	45	116	48	327	10	27	200	76
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	68	24	36	6	47	121	50	341	10	28	208	79
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.6	11.3	18.3	15.5
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	53%	4%	9%
Vol Thru, %	85%	19%	27%	66%
Vol Right, %	3%	28%	69%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	385	123	167	303
LT Vol	48	65	6	27
Through Vol	327	23	45	200
RT Vol	10	35	116	76
Lane Flow Rate	401	128	174	316
Geometry Grp	1	1	1	1
Degree of Util (X)	0.636	0.252	0.283	0.523
Departure Headway (Hd)	5.713	7.086	5.854	5.968
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	630	504	609	600
Service Time	3.778	5.18	3.941	4.039
HCM Lane V/C Ratio	0.637	0.254	0.286	0.527
HCM Control Delay	18.3	12.6	11.3	15.5
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	4.5	1	1.2	3

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (vph)	730	90	211	541	129	146
Future Volume (vph)	730	90	211	541	129	146
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1801	0	1744	1958	1578	0
Flt Permitted			0.085		0.977	
Satd. Flow (perm)	1801	0	156	1958	1578	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	12					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	901	0	232	595	302	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	48.0		12.0	60.0	20.0	
Total Split (%)	60.0%		15.0%	75.0%	25.0%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	42.8		56.0	54.8	14.8	
Actuated g/C Ratio	0.54		0.70	0.68	0.18	
v/c Ratio	0.93		0.87	0.44	1.04	
Control Delay	35.1		40.8	6.4	98.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	35.1		40.8	6.4	98.1	
LOS	D		D	A	F	
Approach Delay	35.1			16.1	98.1	
Approach LOS	D			B	F	
Queue Length 50th (ft)	385		55	114	~165	
Queue Length 95th (ft)	#660		m#114	m141	#316	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	969		268	1341	291	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.93		0.87	0.44	1.04	

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 36.7
 Intersection LOS: D
 Intersection Capacity Utilization 87.7%
 ICU Level of Service E
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 No Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	730	90	211	541	129	146
Future Volume (veh/h)	730	90	211	541	129	146
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	802	90	232	595	142	160
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	839	94	291	1431	144	162
Arrive On Green	0.55	0.54	0.17	1.00	0.19	0.17
Sat Flow, veh/h	1532	172	1914	2090	779	878
Grp Volume(v), veh/h	0	892	232	595	303	0
Grp Sat Flow(s),veh/h/ln	0	1704	1914	2090	1663	0
Q Serve(g_s), s	0.0	39.7	3.9	0.0	14.5	0.0
Cycle Q Clear(g_c), s	0.0	39.7	3.9	0.0	14.5	0.0
Prop In Lane		0.10	1.00		0.47	0.53
Lane Grp Cap(c), veh/h	0	933	291	1431	308	0
V/C Ratio(X)	0.00	0.96	0.80	0.42	0.98	0.00
Avail Cap(c_a), veh/h	0	933	315	1431	308	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	17.2	16.4	0.0	32.8	0.0
Incr Delay (d2), s/veh	0.0	20.5	12.5	0.9	47.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	25.4	5.5	0.6	14.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	37.7	28.9	0.9	80.2	0.0
LnGrp LOS	A	D	C	A	F	A
Approach Vol, veh/h	892			827	303	
Approach Delay, s/veh	37.7			8.7	80.2	
Approach LOS	D			A	F	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.0	49.0		20.0		60.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	41.8		13.8		53.8
Max Q Clear Time (g_c+I1), s	5.9	41.7		16.5		2.0
Green Ext Time (p_c), s	0.1	0.0		0.0		19.4
Intersection Summary						
HCM 6th Ctrl Delay			32.2			
HCM 6th LOS			C			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	856	0	0	1005	107	1	0	2	42	0	84
Future Volume (vph)	85	856	0	0	1005	107	1	0	2	42	0	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1741	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1741	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	920	0	0	1196	0	0	3	0	45	90	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 80.2%

ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	8.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	856	0	0	1005	107	1	0	2	42	0	84
Future Vol, veh/h	85	856	0	0	1005	107	1	0	2	42	0	84
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	91	920	0	0	1081	115	1	0	2	45	0	90

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1196	0	0	920	0	0	2287	2298	920	2242	2241	1140
Stage 1	-	-	-	-	-	-	1102	1102	-	1139	1139	-
Stage 2	-	-	-	-	-	-	1185	1196	-	1103	1102	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	555	-	-	421	-	-	38	51	363	46	62	281
Stage 1	-	-	-	-	-	-	320	328	-	326	337	-
Stage 2	-	-	-	-	-	-	289	299	-	340	348	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	555	-	-	421	-	-	23	43	363	~ 40	52	281
Mov Cap-2 Maneuver	-	-	-	-	-	-	23	43	-	~ 40	52	-
Stage 1	-	-	-	-	-	-	268	274	-	273	337	-
Stage 2	-	-	-	-	-	-	196	299	-	283	291	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0	67.3	129.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	61	555	-	-	421	-	-	40	281
HCM Lane V/C Ratio	0.053	0.165	-	-	-	-	-	1.129	0.321
HCM Control Delay (s)	67.3	12.8	-	-	0	-	-	\$ 339.8	23.8
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.2	0.6	-	-	0	-	-	4.5	1.3

Notes												
~: Volume exceeds capacity			\$: Delay exceeds 300s			+: Computation Not Defined			*: All major volume in platoon			

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	660	38	159	810	18	282	3	122	25	9	17
Future Volume (vph)	15	660	38	159	810	18	282	3	122	25	9	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1574	0	1761	1751	0
Flt Permitted	0.277			0.162			0.740			0.674		
Satd. Flow (perm)	482	1766	1550	268	1697	1608	1314	1574	0	1250	1751	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40			127			18
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	688	40	166	844	19	294	130	0	26	27	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.4	37.4	37.4	51.5	50.2	50.2	19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.64	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.07	0.83	0.05	0.54	0.79	0.02	0.94	0.28		0.09	0.06	
Control Delay	11.9	19.7	0.2	14.6	8.9	0.1	70.4	7.0		24.8	14.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.9	19.7	0.2	14.6	8.9	0.1	70.4	7.0		24.8	14.2	
LOS	B	B	A	B	A	A	E	A		C	B	
Approach Delay		18.5			9.6			51.0			19.4	
Approach LOS		B			A			D			B	
Queue Length 50th (ft)	3	138	0	6	31	0	145	1		10	4	
Queue Length 95th (ft)	m4	m212	m0	m46	67	m0	#294	42		30	23	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	225	825	785	311	1064	1023	313	472		298	431	
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	0.07	0.83	0.05	0.53	0.79	0.02	0.94	0.28		0.09	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 20.6

Intersection LOS: C

Intersection Capacity Utilization 94.4%

ICU Level of Service F

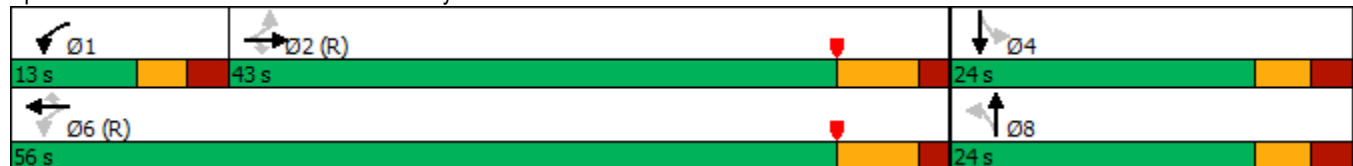
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	660	38	159	810	18	282	3	122	25	9	17
Future Volume (veh/h)	15	660	38	159	810	18	282	3	122	25	9	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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	16	688	25	166	844	16	294	3	87	26	9	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	433	983	844	546	1089	968	435	13	389	374	169	281
Arrive On Green	0.97	0.97	0.97	0.17	1.00	1.00	0.24	0.24	0.23	0.24	0.24	0.23
Sat Flow, veh/h	708	2032	1745	1666	1736	1542	1467	56	1628	1409	707	1179
Grp Volume(v), veh/h	16	688	25	166	844	16	294	0	90	26	0	24
Grp Sat Flow(s),veh/h/ln	708	2032	1745	1666	1736	1542	1467	0	1685	1409	0	1886
Q Serve(g_s), s	0.1	2.7	0.0	3.6	0.0	0.0	15.3	0.0	3.5	1.2	0.0	0.8
Cycle Q Clear(g_c), s	0.1	2.7	0.0	3.6	0.0	0.0	15.6	0.0	3.5	4.2	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.63
Lane Grp Cap(c), veh/h	433	983	844	546	1089	968	435	0	402	374	0	450
V/C Ratio(X)	0.04	0.70	0.03	0.30	0.77	0.02	0.68	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	433	983	844	577	1089	968	435	0	402	374	0	450
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)	1.00	1.00	1.00	0.67	0.67	0.67	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.7	0.7	0.7	6.6	0.0	0.0	29.3	0.0	24.9	26.0	0.0	23.7
Incr Delay (d2), s/veh	0.2	4.1	0.1	0.2	3.7	0.0	4.1	0.0	0.3	0.1	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(95%),veh/ln	0.0	2.7	0.1	1.7	2.0	0.0	9.7	0.0	2.5	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	4.8	0.7	6.8	3.7	0.0	33.4	0.0	25.2	26.1	0.0	23.8
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	729			1026			384			50		
Approach Delay, s/veh	4.6			4.1			31.5			25.0		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.5	44.5		24.0		56.0		24.0				
Change Period (Y+Rc), s	5.5	6.8		* 5.9		6.8		* 5.9				
Max Green Setting (Gmax), s	7.5	36.2		* 18		49.2		* 18				
Max Q Clear Time (g_c+I1), s	6.1	5.2		6.7		2.5		18.1				
Green Ext Time (p_c), s	0.1	0.8		0.1		1.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	479	1	11	816	77	10	2	1	44	3	117
Future Volume (vph)	89	479	1	11	816	77	10	2	1	44	3	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1829	0	1719	1506	0
Flt Permitted	0.193			0.478				0.677		0.748		
Satd. Flow (perm)	340	1729	0	798	1818	1561	0	1282	0	1353	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			123	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	505	0	12	859	81	0	14	0	46	126	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.8	64.0		55.2	55.2	55.2		9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.25	0.37		0.02	0.69	0.07		0.09		0.29	0.44	
Control Delay	3.7	6.3		4.7	12.3	0.6		30.1		36.3	12.1	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	3.7	6.3		4.7	12.4	0.6		30.1		36.3	12.1	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		5.9			11.3			30.1			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	10	142		1	342	1		6		21	1	
Queue Length 95th (ft)	m17	m216		m2	#408	m1		22		51	47	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	379	1383		550	1254	1111		215		226	354	
Starvation Cap Reductn	0	0		0	46	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	0.25	0.37		0.02	0.71	0.07		0.07		0.20	0.36	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 10.3

Intersection LOS: B

Intersection Capacity Utilization 70.6%

ICU Level of Service C

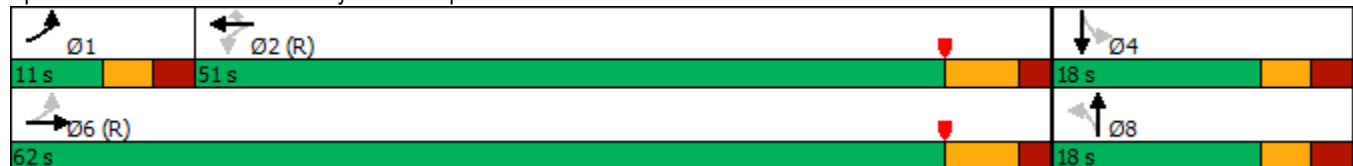
Analysis Period (min) 15

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.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2033 No Build
PM Peak Hour

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	89	479	1	11	816	77	10	2	1	44	3	117								
Future Volume (veh/h)	89	479	1	11	816	77	10	2	1	44	3	117								
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	0.99		1.00	0.99		0.99								
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837								
Adj Flow Rate, veh/h	94	504	1	12	859	72	11	2	0	46	3	67								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95								
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0								
Cap, veh/h	553	1334	3	682	1327	1132	116	16	0	215	5	119								
Arrive On Green	0.11	1.00	1.00	1.00	1.00	1.00	0.07	0.08	0.00	0.08	0.08	0.07								
Sat Flow, veh/h	1629	1679	3	864	1935	1652	414	200	0	1377	66	1479								
Grp Volume(v), veh/h	94	0	505	12	859	72	13	0	0	46	0	70								
Grp Sat Flow(s),veh/h/ln	1629	0	1682	864	1935	1652	614	0	0	1377	0	1545								
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	3.5								
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	2.0	0.0	3.5								
Prop In Lane	1.00		0.00	1.00		1.00	0.85		0.00	1.00		0.96								
Lane Grp Cap(c), veh/h	553	0	1336	682	1327	1132	125	0	0	215	0	124								
V/C Ratio(X)	0.17	0.00	0.38	0.02	0.65	0.06	0.10	0.00	0.00	0.21	0.00	0.56								
Avail Cap(c_a), veh/h	599	0	1336	682	1327	1132	245	0	0	335	0	259								
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(l)	0.49	0.00	0.49	0.66	0.66	0.66	1.00	0.00	0.00	1.00	0.00	1.00								
Uniform Delay (d), s/veh	2.2	0.0	0.0	0.0	0.0	0.0	35.4	0.0	0.0	34.7	0.0	35.9								
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	1.6	0.1	0.4	0.0	0.0	0.5	0.0	4.0								
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(95%),veh/ln	0.3	0.0	0.3	0.0	1.1	0.0	0.5	0.0	0.0	1.6	0.0	2.6								
Unsig. Movement Delay, s/veh																				
LnGrp Delay(d),s/veh	2.2	0.0	0.4	0.0	1.6	0.1	35.8	0.0	0.0	35.2	0.0	39.9								
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D								
Approach Vol, veh/h	599			943			13			116										
Approach Delay, s/veh	0.7			1.5			35.8			38.0										
Approach LOS	A			A			D			D										
Timer - Assigned Phs	1	2	4		6		8													
Phs Duration (G+Y+Rc), s	8.7	60.2	11.0		69.0		11.0													
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6													
Max Green Setting (Gmax), s	5.5	44.6	12.4		55.6		12.4													
Max Q Clear Time (g_c+I1), s	3.6	2.5	5.5		2.5		5.8													
Green Ext Time (p_c), s	0.0	1.2	0.2		0.6		0.0													
Intersection Summary																				
HCM 6th Ctrl Delay	4.0																			
HCM 6th LOS	A																			

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	420	24	43	693	64	100	48	31	54	53	100
Future Volume (vph)	68	420	24	43	693	64	100	48	31	54	53	100
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1708	0	1573	1668	0	1572	1620	0	0	1818	0
Flt Permitted	0.266			0.460			0.484				0.885	
Satd. Flow (perm)	462	1708	0	761	1668	0	800	1620	0	0	1630	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			9			33			63	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	467	0	45	796	0	105	84	0	0	218	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	55.0	55.0		55.0	55.0		15.1	15.1			15.1	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.19	0.19			0.19	
v/c Ratio	0.23	0.40		0.09	0.69		0.70	0.25			0.61	
Control Delay	2.4	1.7		6.1	13.1		52.7	18.5			27.3	
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0			0.0	
Total Delay	2.4	1.7		6.1	13.2		52.7	18.5			27.3	
LOS	A	A		A	B		D	B			C	
Approach Delay		1.8			12.8			37.5			27.3	
Approach LOS		A			B			D			C	
Queue Length 50th (ft)	2	8		6	198		50	22			70	
Queue Length 95th (ft)	3	9		23	444		93	53			124	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	317	1177		523	1150		270	568			591	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	34		0	0			1	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.23	0.40		0.09	0.71		0.39	0.15			0.37	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 13.9

Intersection LOS: B

Intersection Capacity Utilization 86.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230

 Ø2 (R)	 Ø4
48 s	32 s
 Ø6 (R)	 Ø8
48 s	32 s

HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2033 No Build
PM Peak Hour

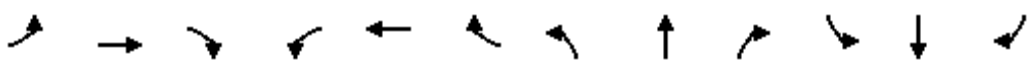
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	420	24	43	693	64	100	48	31	54	53	100
Future Volume (veh/h)	68	420	24	43	693	64	100	48	31	54	53	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	72	442	24	45	729	65	105	51	15	57	56	84
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	408	1148	62	752	1228	110	242	204	60	117	92	113
Arrive On Green	1.00	1.00	1.00	0.72	0.72	0.70	0.16	0.16	0.15	0.15	0.16	0.15
Sat Flow, veh/h	629	1605	87	926	1717	153	1166	1267	373	368	574	701
Grp Volume(v), veh/h	72	0	466	45	0	794	105	0	66	197	0	0
Grp Sat Flow(s),veh/h/ln	629	0	1692	926	0	1870	1166	0	1639	1643	0	0
Q Serve(g_s), s	3.2	0.0	0.0	1.2	0.0	16.8	0.0	0.0	2.8	6.5	0.0	0.0
Cycle Q Clear(g_c), s	20.0	0.0	0.0	1.2	0.0	16.8	9.3	0.0	2.8	9.3	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.08	1.00		0.23	0.29		0.43
Lane Grp Cap(c), veh/h	408	0	1211	752	0	1338	242	0	263	302	0	0
V/C Ratio(X)	0.18	0.00	0.38	0.06	0.00	0.59	0.43	0.00	0.25	0.65	0.00	0.00
Avail Cap(c_a), veh/h	408	0	1211	752	0	1338	448	0	553	597	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(l)	0.94	0.00	0.94	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.9	0.0	0.0	3.4	0.0	5.7	32.1	0.0	29.5	32.4	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.9	0.2	0.0	1.9	1.2	0.0	0.5	2.4	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(95%),veh/ln	0.5	0.0	0.5	0.3	0.0	8.5	3.5	0.0	2.0	6.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.8	0.0	0.9	3.6	0.0	7.6	33.3	0.0	30.0	34.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	538			839			171			197		
Approach Delay, s/veh	1.3			7.4			32.0			34.8		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	62.1			17.9			62.1			17.9		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 42			26.0			* 42			26.0		
Max Q Clear Time (g_c+I1), s	2.0			11.3			18.8			11.3		
Green Ext Time (p_c), s	13.8			0.5			17.9			0.5		
Intersection Summary												
HCM 6th Ctrl Delay			11.0									
HCM 6th LOS			B									
Notes												

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗	↗		↗	↗
Traffic Volume (vph)	0	0	0	648	0	128	324	166	0	0	257	49
Future Volume (vph)	0	0	0	648	0	128	324	166	0	0	257	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.355					
Satd. Flow (perm)	0	0	0	0	1653	1414	594	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	682	135	341	175	0	0	271	52
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.5	25.5	29.2	29.2			16.2	16.2
Actuated g/C Ratio					0.40	0.40	0.45	0.45			0.25	0.25
v/c Ratio					1.04	0.21	0.87	0.25			0.65	0.10
Control Delay					69.0	3.1	38.5	12.0			29.7	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					69.0	3.1	38.5	12.0			29.7	0.4
LOS					E	A	D	B			C	A
Approach Delay					58.1			29.5			25.0	
Approach LOS					E			C			C	
Queue Length 50th (ft)					~303	0	88	40			95	0
Queue Length 95th (ft)					#490	25	#214	76			167	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 No Build

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					656	652	394	706			438	538
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					1.04	0.21	0.87	0.25			0.62	0.10

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 64.2

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 42.7

Intersection LOS: D

Intersection Capacity Utilization 140.4%

ICU Level of Service H

Analysis Period (min) 15

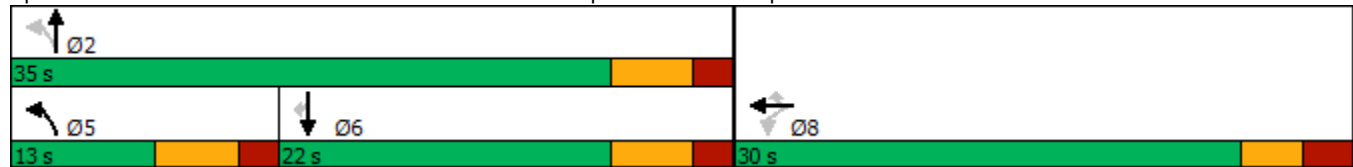
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↷	↶	↷			↷	↶
Traffic Volume (veh/h)	0	0	0	648	0	128	324	166	0	0	257	49
Future Volume (veh/h)	0	0	0	648	0	128	324	166	0	0	257	49
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				682	0	0	341	175	0	0	271	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				739	0		415	682	0	0	393	
Arrive On Green				0.40	0.00	0.00	0.13	0.43	0.00	0.00	0.22	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				682	0	0	341	175	0	0	271	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				22.3	0.0	0.0	8.0	4.3	0.0	0.0	8.6	0.0
Cycle Q Clear(g_c), s				22.3	0.0	0.0	8.0	4.3	0.0	0.0	8.6	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				739	0		415	682	0	0	393	
V/C Ratio(X)				0.92	0.00		0.82	0.26	0.00	0.00	0.69	
Avail Cap(c_a), veh/h				742	0		415	773	0	0	495	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.6	0.0	0.0	17.8	11.2	0.0	0.0	22.0	0.0
Incr Delay (d2), s/veh				17.1	0.0	0.0	12.4	0.7	0.0	0.0	7.8	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
%ile BackOfQ(95%),veh/ln				17.5	0.0	0.0	8.0	2.5	0.0	0.0	7.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				34.7	0.0	0.0	30.2	11.9	0.0	0.0	29.8	0.0
LnGrp LOS				C	A		C	B	A	A	C	
Approach Vol, veh/h					682			516			271	
Approach Delay, s/veh					34.7			24.0			29.8	
Approach LOS					C			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.5			13.0	18.5		29.9				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		24.5				
Max Q Clear Time (g_c+I1), s		6.3			10.0	10.6		24.3				
Green Ext Time (p_c), s		3.4			0.0	1.9		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				30.0								
HCM 6th LOS				C								

Notes

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

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	3	564	0	0	0	0	450	501	103	810	0
Future Volume (vph)	45	3	564	0	0	0	0	450	501	103	810	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1563	1569	0	0	0	0	1666	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1563	1569	0	0	0	0	1666	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	49	581	0	0	0	0	980	0	106	835	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 140.4%

ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2033 No Build
PM Peak Hour

Intersection												
Int Delay, s/veh	52.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	45	3	564	0	0	0	0	450	501	103	810	0
Future Vol, veh/h	45	3	564	0	0	0	0	450	501	103	810	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	46	3	581	0	0	0	0	464	516	106	835	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1511	1511	835	-	0	0	464	0	0
Stage 1	1047	1047	-	-	-	-	-	-	-
Stage 2	464	464	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	123	156 ~ 413		0	-	-	841	-	0
Stage 1	405	366	-	0	-	-	-	-	0
Stage 2	722	613	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	108	0 ~ 413		-	-	-	841	-	-
Mov Cap-2 Maneuver	108	0	-	-	-	-	-	-	-
Stage 1	405	0	-	-	-	-	-	-	-
Stage 2	631	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	211.1	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	108	413	841	-
HCM Lane V/C Ratio	-	-	0.458	1.408	0.126	-
HCM Control Delay (s)	-	-	63.9	223.6	9.9	-
HCM Lane LOS	-	-	F	F	A	-
HCM 95th %tile Q(veh)	-	-	2	28.7	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 No Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	10	9	934	1347	11
Future Volume (vph)	3	10	9	934	1347	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1628	0	0	1801	1781	0
Flt Permitted	0.989					
Satd. Flow (perm)	1628	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	972	1400	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	81.6%			ICU Level of Service D		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 No Build
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	10	9	934	1347	11
Future Vol, veh/h	3	10	9	934	1347	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	10	9	963	1389	11

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2376	1395	1400	0	-	0
Stage 1	1395	-	-	-	-	-
Stage 2	981	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	40	181	446	-	-	-
Stage 1	250	-	-	-	-	-
Stage 2	403	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	38	181	446	-	-	-
Mov Cap-2 Maneuver	38	-	-	-	-	-
Stage 1	239	-	-	-	-	-
Stage 2	403	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	446	-	97	-	-
HCM Lane V/C Ratio	0.021	-	0.138	-	-
HCM Control Delay (s)	13.2	0	48	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	329	35	106	10	43	37	92	583	14	51	854	455
Future Volume (vph)	329	35	106	10	43	37	92	583	14	51	854	455
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1666	0	1416	1704	0	1620	1693	0	1628	1655	0
Flt Permitted	0.702			0.662			0.107			0.351		
Satd. Flow (perm)	1197	1666	0	987	1704	0	182	1693	0	601	1655	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		112			39			4			85	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	346	149	0	11	84	0	97	629	0	54	1378	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	1.45	0.35		0.06	0.23		0.86	0.59		0.14	1.29	
Control Delay	248.7	10.2		20.4	14.4		70.4	12.9		5.8	155.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	248.7	10.2		20.4	14.4		70.4	12.9		5.8	155.7	
LOS	F	B		C	B		E	B		A	F	
Approach Delay		176.9			15.1			20.6			150.0	
Approach LOS		F			B			C			F	
Queue Length 50th (ft)	~176	11		3	14		39	266		7	~653	
Queue Length 95th (ft)	#316	53		15	45		#154	285		20	#885	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	239	422		197	372		113	1059		375	1066	
Starvation Cap Reductn	0	0		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	1.45	0.35		0.06	0.23		0.86	0.59		0.14	1.29	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.45

Intersection Signal Delay: 116.0

Intersection LOS: F

Intersection Capacity Utilization 115.4%

ICU Level of Service H

Analysis Period (min) 15

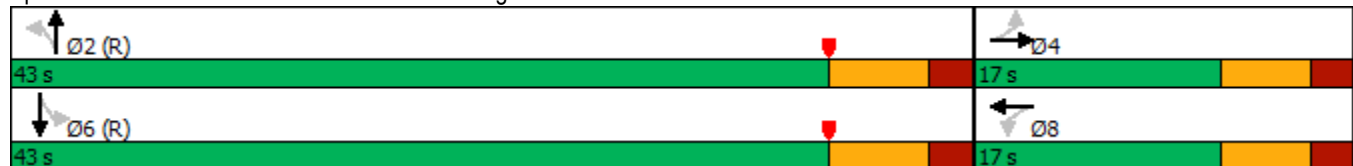
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2033 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	35	106	10	43	37	92	583	14	51	854	455
Future Volume (veh/h)	329	35	106	10	43	37	92	583	14	51	854	455
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	346	37	88	11	45	25	97	614	14	54	899	468
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	352	109	258	272	220	122	120	1129	26	387	744	387
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.21	0.21	0.20	0.63	0.63	0.61
Sat Flow, veh/h	1403	543	1291	1080	1099	611	406	1806	41	831	1190	619
Grp Volume(v), veh/h	346	0	125	11	0	70	97	0	628	54	0	1367
Grp Sat Flow(s),veh/h/ln	1403	0	1833	1080	0	1710	406	0	1847	831	0	1809
Q Serve(g_s), s	9.9	0.0	3.5	0.5	0.0	2.1	0.0	0.0	18.2	2.8	0.0	37.5
Cycle Q Clear(g_c), s	12.0	0.0	3.5	4.1	0.0	2.1	37.5	0.0	18.2	21.1	0.0	37.5
Prop In Lane	1.00		0.70	1.00		0.36	1.00		0.02	1.00		0.34
Lane Grp Cap(c), veh/h	352	0	367	272	0	342	120	0	1155	387	0	1131
V/C Ratio(X)	0.98	0.00	0.34	0.04	0.00	0.20	0.81	0.00	0.54	0.14	0.00	1.21
Avail Cap(c_a), veh/h	352	0	367	272	0	342	120	0	1155	387	0	1131
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.00	0.79	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	20.9	22.4	0.0	20.2	42.6	0.0	16.2	14.8	0.0	11.4
Incr Delay (d2), s/veh	42.9	0.0	0.5	0.1	0.0	0.3	35.4	0.0	1.5	0.8	0.0	102.5
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(95%),veh/ln	13.8	0.0	2.6	0.2	0.0	1.4	4.8	0.0	13.4	1.0	0.0	59.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	0.0	21.5	22.4	0.0	20.5	78.0	0.0	17.6	15.5	0.0	113.9
LnGrp LOS	E	A	C	C	A	C	E	A	B	B	A	F
Approach Vol, veh/h	471		81			725			1421			
Approach Delay, s/veh	56.8		20.7			25.7			110.2			
Approach LOS	E		C			C			F			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	43.0		17.0		43.0		17.0					
Change Period (Y+Rc), s	6.5		6.0		6.5		6.0					
Max Green Setting (Gmax), s	36.5		11.0		36.5		11.0					
Max Q Clear Time (g_c+I1), s	20.2		14.0		39.5		6.1					
Green Ext Time (p_c), s	10.8		0.0		0.0		0.1					
Intersection Summary												
HCM 6th Ctrl Delay	75.5											
HCM 6th LOS	E											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	64	0	41	17	635	5	11	923	35
Future Volume (vph)	15	0	18	64	0	41	17	635	5	11	923	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1670	0	0	1640	0	0	1722	1648
Flt Permitted		0.758			0.805			0.970			0.991	
Satd. Flow (perm)	0	1319	1581	0	1386	0	0	1592	0	0	1708	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	110	0	0	691	0	0	984	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.7	8.7		8.7			45.0			45.0	45.0
Actuated g/C Ratio		0.14	0.14		0.14			0.75			0.75	0.75
v/c Ratio		0.08	0.07		0.44			0.58			0.77	0.03
Control Delay		22.1	1.7		19.1			7.9			5.3	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		22.1	1.7		19.1			7.9			5.3	0.1
LOS		C	A		B			A			A	A
Approach Delay		11.0			19.1			7.9			5.1	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5	0		18			265			31	0
Queue Length 95th (ft)		19	4		57			214			m37	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		230	322		287			1194			1281	1247
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		0.07	0.06		0.38			0.58			0.77	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 7.1

Intersection LOS: A

Intersection Capacity Utilization 77.5%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

 Ø2 (R)	 Ø4
45 s	15 s
 Ø6 (R)	 Ø8
45 s	15 s

HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	64	0	41	17	635	5	11	923	35
Future Volume (veh/h)	15	0	18	64	0	41	17	635	5	11	923	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	67	0	28	18	668	5	12	972	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	291	0	170	201	4	43	73	1205	9	65	1345	1214
Arrive On Green	0.09	0.00	0.11	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1597	0	1586	927	36	403	16	1640	12	6	1830	1652
Grp Volume(v), veh/h	16	0	11	95	0	0	691	0	0	984	0	36
Grp Sat Flow(s),veh/h/ln	1597	0	1586	1366	0	0	1668	0	0	1837	0	1652
Q Serve(g_s), s	0.0	0.0	0.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.71		0.29	0.03		0.01	0.01		1.00
Lane Grp Cap(c), veh/h	264	0	170	226	0	0	1259	0	0	1380	0	1214
V/C Ratio(X)	0.06	0.00	0.06	0.42	0.00	0.00	0.55	0.00	0.00	0.71	0.00	0.03
Avail Cap(c_a), veh/h	355	0	278	325	0	0	1259	0	0	1380	0	1214
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	24.6	0.0	24.1	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.2	0.0	0.0	1.7	0.0	0.0	0.3	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(95%),veh/ln	0.4	0.0	0.3	2.5	0.0	0.0	1.1	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	24.3	27.7	0.0	0.0	1.7	0.0	0.0	0.3	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	27			95			691			1020		
Approach Delay, s/veh	24.5			27.7			1.7			0.3		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	49.1			10.9			49.1			10.9		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	2.0			2.5			2.0			6.2		
Green Ext Time (p_c), s	21.9			0.0			31.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay				2.6								
HCM 6th LOS				A								

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	318	69	23	347	150	110	315	18	236	384	303
Future Volume (vph)	227	318	69	23	347	150	110	315	18	236	384	303
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1812	0	1604	1640	1442
Flt Permitted	0.199			0.562			0.372			0.304		
Satd. Flow (perm)	333	1791	1435	895	1697	1577	596	1812	0	513	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		2				312
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1028				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	234	328	71	24	358	155	113	344	0	243	396	312
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	51.9	51.9	51.9	29.7	29.7	29.7	45.4	36.6		55.8	41.8	41.8
Actuated g/C Ratio	0.43	0.43	0.43	0.25	0.25	0.25	0.38	0.30		0.46	0.35	0.35
v/c Ratio	0.74	0.42	0.10	0.11	0.85	0.30	0.39	0.62		0.67	0.69	0.44
Control Delay	35.9	24.4	1.5	32.9	61.6	6.0	25.6	43.5		25.0	35.1	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	35.9	24.4	1.5	32.9	61.6	6.0	25.6	43.5		25.0	35.1	7.0
LOS	D	C	A	C	E	A	C	D		C	D	A
Approach Delay		26.1			44.2			39.1			23.3	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	116	171	0	14	265	0	50	230		106	222	39
Queue Length 95th (ft)	155	213	12	34	345	45	100	#414		m157	m#477	m74
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	327	932	795	294	558	625	295	554		365	571	705
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.72	0.35	0.09	0.08	0.64	0.25	0.38	0.62		0.67	0.69	0.44

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 31.1

Intersection LOS: C

Intersection Capacity Utilization 84.2%

ICU Level of Service E

Analysis Period (min) 15

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4 (R)
23 s	45 s	20 s	32 s
 Ø6	 Ø7	 Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	227	318	69	23	347	150	110	315	18	236	384	303
Future Volume (veh/h)	227	318	69	23	347	150	110	315	18	236	384	303
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	234	328	41	24	358	0	113	325	18	243	396	241
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	312	730	624	272	400		366	682	38	450	641	543
Arrive On Green	0.13	0.40	0.40	0.23	0.23	0.00	0.07	0.34	0.33	0.16	0.52	0.52
Sat Flow, veh/h	1736	1823	1557	934	1766	1544	1880	2024	112	1616	1655	1402
Grp Volume(v), veh/h	234	328	41	24	358	0	113	0	343	243	396	241
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	934	1766	1544	1880	0	2136	1616	1655	1402
Q Serve(g_s), s	11.7	15.8	1.9	2.4	23.6	0.0	4.6	0.0	15.2	11.3	20.4	13.0
Cycle Q Clear(g_c), s	11.7	15.8	1.9	2.4	23.6	0.0	4.6	0.0	15.2	11.3	20.4	13.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	312	730	624	272	400		366	0	720	450	641	543
V/C Ratio(X)	0.75	0.45	0.07	0.09	0.89		0.31	0.00	0.48	0.54	0.62	0.44
Avail Cap(c_a), veh/h	343	950	811	367	581		382	0	720	450	641	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.5	26.3	22.1	36.8	45.0	0.0	23.7	0.0	31.4	20.3	22.8	21.0
Incr Delay (d2), s/veh	8.1	0.2	0.0	0.1	9.4	0.0	0.5	0.0	2.3	1.3	4.4	2.6
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(95%),veh/ln	9.2	10.8	1.3	1.0	16.5	0.0	3.8	0.0	13.2	7.2	12.1	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	26.5	22.2	36.9	54.4	0.0	24.2	0.0	33.7	21.6	27.2	23.6
LnGrp LOS	D	C	C	D	D		C	A	C	C	C	C
Approach Vol, veh/h	603			382			456			880		
Approach Delay, s/veh	30.9			53.3			31.3			24.6		
Approach LOS	C			D			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	20.9	32.7	20.0	46.4		53.6	13.9	52.5				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	14.2	26.1	13.8	17.2		18.3	7.1	22.9				
Green Ext Time (p_c), s	0.2	0.1	0.0	1.0		0.1	0.0	2.1				

Intersection Summary

HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2033 No Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	523	466	59	40	1
Future Volume (vph)	6	523	466	59	40	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1765	0	1668	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1765	0	1668	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	545	546	0	43	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 38.1% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	523	466	59	40	1
Future Vol, veh/h	6	523	466	59	40	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	545	485	61	42	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	546	0	-	0	1073	516
Stage 1	-	-	-	-	516	-
Stage 2	-	-	-	-	557	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	802	-	-	-	239	575
Stage 1	-	-	-	-	643	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	802	-	-	-	237	575
Mov Cap-2 Maneuver	-	-	-	-	393	-
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	611	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		15.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	802	-	-	-	396	
HCM Lane V/C Ratio	0.008	-	-	-	0.108	
HCM Control Delay (s)	9.5	-	-	-	15.2	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2033 No Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	85	80	4	53	58	34	304	6	89	350	49
Future Volume (vph)	81	85	80	4	53	58	34	304	6	89	350	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1397	0	0	1575	0	0	1670	0	0	1576	0
Flt Permitted		0.984			0.998			0.995			0.991	
Satd. Flow (perm)	0	1397	0	0	1575	0	0	1670	0	0	1576	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	256	0	0	119	0	0	358	0	0	509	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	70.8%											
Analysis Period (min)	15											
ICU Level of Service C												

Intersection	
Intersection Delay, s/veh	34.2
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	81	85	80	4	53	58	34	304	6	89	350	49
Future Vol, veh/h	81	85	80	4	53	58	34	304	6	89	350	49
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	84	89	83	4	55	60	35	317	6	93	365	51
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	20.3	13.1	23.4	53.7
HCM LOS	C	B	C	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	33%	3%	18%
Vol Thru, %	88%	35%	46%	72%
Vol Right, %	2%	33%	50%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	344	246	115	488
LT Vol	34	81	4	89
Through Vol	304	85	53	350
RT Vol	6	80	58	49
Lane Flow Rate	358	256	120	508
Geometry Grp	1	1	1	1
Degree of Util (X)	0.68	0.555	0.251	0.95
Departure Headway (Hd)	6.83	7.802	7.543	6.729
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	527	459	479	534
Service Time	4.924	5.9	5.543	4.812
HCM Lane V/C Ratio	0.679	0.558	0.251	0.951
HCM Control Delay	23.4	20.3	13.1	53.7
HCM Lane LOS	C	C	B	F
HCM 95th-tile Q	5.1	3.3	1	12.2

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (vph)	644	87	137	548	93	131
Future Volume (vph)	644	87	137	548	93	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1835	0	1761	1958	1577	0
Flt Permitted			0.197		0.980	
Satd. Flow (perm)	1835	0	365	1958	1577	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	8					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	739	0	138	554	226	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	62.0		75.9	74.7	24.9	
Actuated g/C Ratio	0.56		0.69	0.68	0.23	
v/c Ratio	0.71		0.38	0.42	0.63	
Control Delay	23.7		8.1	9.1	45.8	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	23.7		8.1	9.1	45.8	
LOS	C		A	A	D	
Approach Delay	23.7			8.9	45.8	
Approach LOS	C			A	D	
Queue Length 50th (ft)	360		32	174	145	
Queue Length 95th (ft)	600		m51	m265	208	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	1037		365	1329	570	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.71		0.38	0.42	0.40	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 20.5

Intersection LOS: C

Intersection Capacity Utilization 75.3%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230

↙ Ø1	→ Ø2 (R)	↖ Ø4
13 s	52 s	45 s
↖ Ø6 (R)		
65 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 No Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	
Traffic Volume (veh/h)	644	87	137	548	93	131
Future Volume (veh/h)	644	87	137	548	93	131
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	651	86	138	554	94	132
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	972	128	455	1519	123	173
Arrive On Green	0.64	0.63	0.05	0.73	0.18	0.17
Sat Flow, veh/h	1527	202	1927	2090	690	969
Grp Volume(v), veh/h	0	737	138	554	227	0
Grp Sat Flow(s),veh/h/ln	0	1728	1927	2090	1666	0
Q Serve(g_s), s	0.0	29.8	2.5	10.8	14.3	0.0
Cycle Q Clear(g_c), s	0.0	29.8	2.5	10.8	14.3	0.0
Prop In Lane		0.12	1.00		0.41	0.58
Lane Grp Cap(c), veh/h	0	1100	455	1519	297	0
V/C Ratio(X)	0.00	0.67	0.30	0.36	0.76	0.00
Avail Cap(c_a), veh/h	0	1100	509	1519	603	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.7	10.6	5.6	43.3	0.0
Incr Delay (d2), s/veh	0.0	3.2	0.4	0.7	13.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	16.8	1.8	7.6	11.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	15.9	11.0	6.3	56.9	0.0
LnGrp LOS	A	B	B	A	E	A
Approach Vol, veh/h	737			692	227	
Approach Delay, s/veh	15.9			7.2	56.9	
Approach LOS	B			A	E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.9	75.2		24.8		85.2
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	4.5	31.8		16.3		12.8
Green Ext Time (p_c), s	0.1	10.3		2.4		16.7
Intersection Summary						
HCM 6th Ctrl Delay			17.9			
HCM 6th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	837	0	1	857	106	0	0	1	50	0	37
Future Volume (vph)	17	837	0	1	857	106	0	0	1	50	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	872	0	1	1003	0	0	1	0	52	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 67.6% ICU Level of Service C

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	837	0	1	857	106	0	0	1	50	0	37
Future Vol, veh/h	17	837	0	1	857	106	0	0	1	50	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	872	0	1	893	110	0	0	1	52	0	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1003	0	0	872	0	0	1878	1913	872	1859	1858	948
Stage 1	-	-	-	-	-	-	908	908	-	950	950	-
Stage 2	-	-	-	-	-	-	970	1005	-	909	908	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	632	-	-	446	-	-	72	85	386	82	101	359
Stage 1	-	-	-	-	-	-	406	395	-	407	400	-
Stage 2	-	-	-	-	-	-	377	360	-	427	415	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	632	-	-	446	-	-	63	82	386	80	98	359
Mov Cap-2 Maneuver	-	-	-	-	-	-	63	82	-	80	98	-
Stage 1	-	-	-	-	-	-	395	384	-	396	399	-
Stage 2	-	-	-	-	-	-	336	359	-	414	403	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	14.4	70.5
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	386	632	-	-	446	-	-	80	359
HCM Lane V/C Ratio	0.003	0.028	-	-	0.002	-	-	0.651	0.107
HCM Control Delay (s)	14.4	10.9	-	-	13.1	-	-	110.6	16.2
HCM Lane LOS	B	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	3	0.4

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	591	51	160	688	16	268	3	168	36	4	15
Future Volume (vph)	22	591	51	160	688	16	268	3	168	36	4	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1572	0	1761	1740	0
Flt Permitted	0.369			0.253			0.744			0.530		
Satd. Flow (perm)	641	1783	1584	419	1697	1573	1327	1572	0	983	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			177			16
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	622	54	168	724	17	282	180	0	38	20	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	58.6	58.6	58.6	75.2	73.9	73.9	25.4	25.4		25.4	25.4	
Actuated g/C Ratio	0.53	0.53	0.53	0.68	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.07	0.66	0.06	0.42	0.64	0.02	0.92	0.36		0.17	0.05	
Control Delay	15.1	18.8	2.7	8.9	9.9	1.3	77.3	7.6		35.7	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	15.1	18.8	2.7	8.9	9.9	1.3	77.3	7.6		35.7	16.9	
LOS	B	B	A	A	A	A	E	A		D	B	
Approach Delay		17.4			9.6			50.1			29.2	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	6	177	0	27	159	0	194	2		21	2	
Queue Length 95th (ft)	m15	314	m6	59	246	m1	#351	57		51	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	341	949	882	470	1140	1066	314	507		233	425	
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	0.07	0.66	0.06	0.36	0.64	0.02	0.90	0.36		0.16	0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 21.5

Intersection LOS: C

Intersection Capacity Utilization 87.6%

ICU Level of Service E

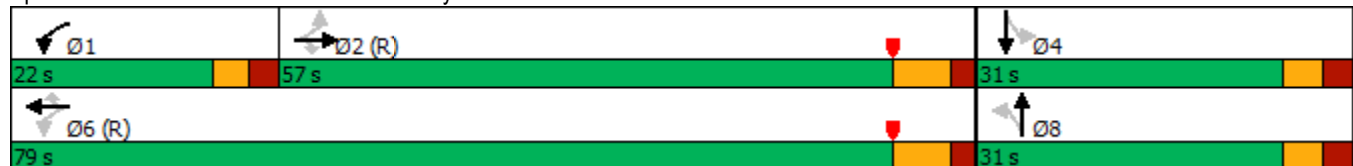
Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2033 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	591	51	160	688	16	268	3	168	36	4	15
Future Volume (veh/h)	22	591	51	160	688	16	268	3	168	36	4	15
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	622	32	168	724	12	282	3	112	38	4	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	518	1165	993	602	1187	1053	390	10	361	295	126	284
Arrive On Green	1.00	1.00	1.00	0.15	1.00	1.00	0.22	0.22	0.21	0.22	0.22	0.21
Sat Flow, veh/h	794	2047	1743	1666	1736	1540	1488	44	1646	1382	576	1296
Grp Volume(v), veh/h	23	622	32	168	724	12	282	0	115	38	0	13
Grp Sat Flow(s),veh/h/ln	794	2047	1743	1666	1736	1540	1488	0	1690	1382	0	1871
Q Serve(g_s), s	0.0	0.0	0.0	4.3	0.0	0.0	20.1	0.0	6.3	2.6	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.3	0.0	0.0	20.2	0.0	6.3	8.4	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.69
Lane Grp Cap(c), veh/h	518	1165	993	602	1187	1053	390	0	370	295	0	410
V/C Ratio(X)	0.04	0.53	0.03	0.28	0.61	0.01	0.72	0.00	0.31	0.13	0.00	0.03
Avail Cap(c_a), veh/h	518	1165	993	745	1187	1053	417	0	401	320	0	444
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)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.4	0.0	0.0	41.5	0.0	36.4	39.3	0.0	34.1
Incr Delay (d2), s/veh	0.2	1.8	0.1	0.2	1.9	0.0	5.7	0.0	0.5	0.2	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(95%),veh/ln	0.0	1.0	0.0	2.2	1.1	0.0	12.6	0.0	4.9	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	1.8	0.1	6.6	1.9	0.0	47.2	0.0	36.9	39.5	0.0	34.1
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	677			904			397			51		
Approach Delay, s/veh	1.6			2.7			44.2			38.1		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	12.6	68.4	29.0		81.0		29.0					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25		72.2		* 25					
Max Q Clear Time (g_c+I1), s	6.8	2.5	10.9		2.5		22.7					
Green Ext Time (p_c), s	0.3	0.7	0.1		0.9		0.4					

Intersection Summary

HCM 6th Ctrl Delay 11.4
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	535	13	4	670	69	10	3	11	64	41	134
Future Volume (vph)	112	535	13	4	670	69	10	3	11	64	41	134
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1740	0	1744	1818	1561	0	1763	0	1719	1574	0
Flt Permitted	0.281			0.442				0.570		0.740		
Satd. Flow (perm)	496	1740	0	812	1818	1561	0	1026	0	1339	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		12			136	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	589	0	4	720	74	0	26	0	69	188	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.6	87.7		75.0	75.0	75.0		12.3		12.3	12.3	
Actuated g/C Ratio	0.81	0.80		0.68	0.68	0.68		0.11		0.11	0.11	
v/c Ratio	0.25	0.42		0.01	0.58	0.07		0.21		0.46	0.63	
Control Delay	4.3	5.3		6.5	13.5	1.8		31.6		54.5	24.4	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0		0.0	0.0	
Total Delay	4.3	5.3		6.5	13.7	1.8		31.6		54.5	24.4	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		5.1			12.6			31.6			32.5	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	18	106		1	300	2		9		46	34	
Queue Length 95th (ft)	m32	193		m3	489	9		35		88	102	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	501	1387		553	1239	1089		227		284	441	
Starvation Cap Reductn	0	0		0	105	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	0.24	0.42		0.01	0.63	0.07		0.11		0.24	0.43	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 12.7

Intersection LOS: B

Intersection Capacity Utilization 67.0%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary
10: Driveway/Market Sq Dr & SR 0230

2033 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	535	13	4	670	69	10	3	11	64	41	134
Future Volume (veh/h)	112	535	13	4	670	69	10	3	11	64	41	134
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	120	575	12	4	720	61	11	3	8	69	44	73
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	600	1339	28	686	1391	1187	67	26	25	194	62	103
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09
Sat Flow, veh/h	1629	1656	35	864	1935	1652	176	263	251	1374	619	1027
Grp Volume(v), veh/h	120	0	587	4	720	61	22	0	0	69	0	117
Grp Sat Flow(s),veh/h/ln	1629	0	1690	864	1935	1652	690	0	0	1374	0	1646
Q Serve(g_s), s	1.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.6
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0	5.9	0.0	7.6
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.36	1.00		0.62
Lane Grp Cap(c), veh/h	600	0	1367	686	1391	1187	112	0	0	194	0	165
V/C Ratio(X)	0.20	0.00	0.43	0.01	0.52	0.05	0.20	0.00	0.00	0.36	0.00	0.71
Avail Cap(c_a), veh/h	661	0	1367	686	1391	1187	273	0	0	348	0	350
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)	0.74	0.00	0.74	0.88	0.88	0.88	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.5	0.0	0.0	0.0	0.0	0.0	45.6	0.0	0.0	47.2	0.0	48.2
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	1.2	0.1	0.8	0.0	0.0	1.1	0.0	5.5
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(95%),veh/ln	0.7	0.0	0.5	0.0	0.8	0.0	1.1	0.0	0.0	3.4	0.0	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.6	0.0	0.7	0.0	1.2	0.1	46.5	0.0	0.0	48.3	0.0	53.7
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	707			785			22			186		
Approach Delay, s/veh	1.1			1.1			46.5			51.7		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.9	84.5	15.7		94.3		15.7					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.4	2.5	9.6		2.5		9.7					
Green Ext Time (p_c), s	0.1	1.0	0.5		0.7		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				7.2								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	512	25	21	547	14	69	25	18	16	21	78
Future Volume (vph)	57	512	25	21	547	14	69	25	18	16	21	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1744	0	1620	1698	0	1541	1661	0	0	1823	0
Flt Permitted	0.407			0.421			0.525				0.951	
Satd. Flow (perm)	707	1744	0	718	1698	0	852	1661	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			19			82	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	565	0	22	591	0	73	45	0	0	121	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.3	86.3		86.3	86.3		13.8	13.8			13.8	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.13	0.13			0.13	
v/c Ratio	0.11	0.41		0.04	0.44		0.68	0.20			0.42	
Control Delay	5.5	6.8		3.8	5.7		75.2	28.8			20.3	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0			0.0	
Total Delay	5.5	7.0		3.8	5.7		75.2	28.8			20.3	
LOS	A	A		A	A		E	C			C	
Approach Delay		6.8			5.7			57.5			20.3	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	12	156		3	111		50	17			25	
Queue Length 95th (ft)	32	214		11	218		96	48			76	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	554	1368		563	1331		317	631			702	
Starvation Cap Reductn	0	176		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	31		0	0			1	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.11	0.47		0.04	0.45		0.23	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 11.5

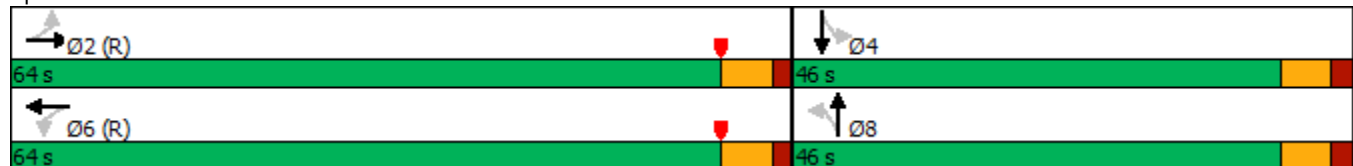
Intersection LOS: B

Intersection Capacity Utilization 69.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2033 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	512	25	21	547	14	69	25	18	16	21	78
Future Volume (veh/h)	57	512	25	21	547	14	69	25	18	16	21	78
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	60	539	21	22	576	14	73	26	7	17	22	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	638	1377	54	786	1542	37	174	107	29	62	53	67
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	761	1659	65	868	1858	45	1239	1328	358	275	661	840
Grp Volume(v), veh/h	60	0	560	22	0	590	73	0	33	74	0	0
Grp Sat Flow(s),veh/h/ln	761	0	1724	868	0	1904	1239	0	1685	1777	0	0
Q Serve(g_s), s	0.9	0.0	0.0	0.5	0.0	8.4	1.2	0.0	2.0	1.9	0.0	0.0
Cycle Q Clear(g_c), s	9.3	0.0	0.0	0.5	0.0	8.4	5.5	0.0	2.0	4.4	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	1.00		0.21	0.23		0.47
Lane Grp Cap(c), veh/h	638	0	1431	786	0	1580	174	0	135	167	0	0
V/C Ratio(X)	0.09	0.00	0.39	0.03	0.00	0.37	0.42	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	638	0	1431	786	0	1580	536	0	628	674	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(l)	0.91	0.00	0.91	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.0	0.0	1.6	0.0	2.3	49.0	0.0	47.6	48.8	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.7	0.1	0.0	0.7	1.6	0.0	0.9	1.9	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(95%),veh/ln	0.1	0.0	0.5	0.1	0.0	3.4	3.6	0.0	1.6	3.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.7	0.0	0.7	1.7	0.0	3.0	50.6	0.0	48.5	50.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	620				612				106			
Approach Delay, s/veh	0.7				2.9				49.9			
Approach LOS	A				A				D			
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.2			13.8			96.2			13.8		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.4			10.4			7.5		
Green Ext Time (p_c), s	20.7			0.2			21.5			0.4		

Intersection Summary

HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A

Notes

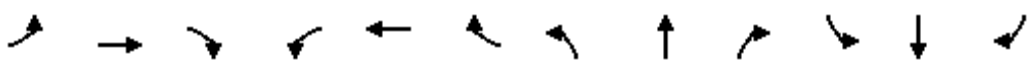
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 No Build

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	355	1	62	216	119	0	0	134	29
Future Volume (vph)	0	0	0	355	1	62	216	119	0	0	134	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1642	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.953		0.496					
Satd. Flow (perm)	0	0	0	0	1642	1442	822	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	371	65	225	124	0	0	140	30
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.9	16.9	27.6	27.6			14.5	14.5
Actuated g/C Ratio					0.31	0.31	0.51	0.51			0.27	0.27
v/c Ratio					0.72	0.12	0.42	0.15			0.30	0.06
Control Delay					25.7	0.4	11.1	8.5			18.8	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					25.7	0.4	11.1	8.5			18.8	0.2
LOS					C	A	B	A			B	A
Approach Delay					21.9			10.2			15.5	
Approach LOS					C			B			B	
Queue Length 50th (ft)					100	0	39	20			37	0
Queue Length 95th (ft)					195	0	82	47			79	0
Internal Link Dist (ft)		920			920			470			916	

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					627	652	531	917			551	606
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					0.59	0.10	0.42	0.14			0.25	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 54.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 16.5

Intersection LOS: B

Intersection Capacity Utilization 56.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	355	1	62	216	119	0	0	134	29
Future Volume (veh/h)	0	0	0	355	1	62	216	119	0	0	134	29
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				370	1	0	225	124	0	0	140	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				492	1		646	902	0	0	498	
Arrive On Green				0.26	0.28	0.00	0.16	0.53	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1781	5	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				371	0	0	225	124	0	0	140	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				9.3	0.0	0.0	4.1	1.8	0.0	0.0	2.9	0.0
Cycle Q Clear(g_c), s				9.3	0.0	0.0	4.1	1.8	0.0	0.0	2.9	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				494	0		646	902	0	0	498	
V/C Ratio(X)				0.75	0.00		0.35	0.14	0.00	0.00	0.28	
Avail Cap(c_a), veh/h				753	0		657	1054	0	0	651	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.5	0.0	0.0	8.3	5.8	0.0	0.0	14.1	0.0
Incr Delay (d2), s/veh				2.3	0.0	0.0	0.3	0.3	0.0	0.0	1.1	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
%ile BackOfQ(95%),veh/ln				6.8	0.0	0.0	1.9	0.8	0.0	0.0	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.9	0.0	0.0	8.6	6.1	0.0	0.0	15.2	0.0
LnGrp LOS				B	A		A	A	A	A	B	
Approach Vol, veh/h					371			349			140	
Approach Delay, s/veh					18.9			7.7			15.2	
Approach LOS					B			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		30.7			12.7	18.0		17.9				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		3.8			6.1	4.9		11.3				
Green Ext Time (p_c), s		2.4			0.1	1.6		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				13.8								
HCM 6th LOS				B								

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	219	0	0	0	0	301	363	91	399	0
Future Volume (vph)	25	0	219	0	0	0	0	301	363	91	399	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1669	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	235	0	0	0	0	714	0	98	429	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 56.4%

ICU Level of Service B

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2033 No Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	25	0	219	0	0	0	0	301	363	91	399	0
Future Vol, veh/h	25	0	219	0	0	0	0	301	363	91	399	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	27	0	235	0	0	0	0	324	390	98	429	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	949	949	429	-	0	0	324	0	0
Stage 1	625	625	-	-	-	-	-	-	-
Stage 2	324	324	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	298	307	686	0	-	-	964	-	0
Stage 1	638	533	-	0	-	-	-	-	0
Stage 2	854	690	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	268	0	686	-	-	-	964	-	-
Mov Cap-2 Maneuver	268	0	-	-	-	-	-	-	-
Stage 1	638	0	-	-	-	-	-	-	-
Stage 2	767	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	268	686	964	-
HCM Lane V/C Ratio	-	-	0.1	0.343	0.102	-
HCM Control Delay (s)	-	-	19.9	13	9.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	1.5	0.3	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 No Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	12	14	637	634	3
Future Volume (vph)	6	12	14	637	634	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1557	0	0	1800	1796	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1557	0	0	1800	1796	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	0	693	677	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	54.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 No Build
SAT Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	12	14	637	634	3
Future Vol, veh/h	6	12	14	637	634	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	13	15	678	674	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1384	676	677	0	-	0
Stage 1	676	-	-	-	-	-
Stage 2	708	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	156	478	754	-	-	-
Stage 1	526	-	-	-	-	-
Stage 2	507	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	151	478	754	-	-	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	507	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.9	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	754	-	278	-	-
HCM Lane V/C Ratio	0.02	-	0.069	-	-
HCM Control Delay (s)	9.9	0	18.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	25	56	12	22	34	31	470	9	20	447	189
Future Volume (vph)	159	25	56	12	22	34	31	470	9	20	447	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1685	0	1572	1634	0	1620	1710	0	1550	1683	0
Flt Permitted	0.719			0.702			0.330			0.441		
Satd. Flow (perm)	1226	1685	0	1162	1634	0	563	1710	0	720	1683	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			36			3			60	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	85	0	13	59	0	33	504	0	21	670	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.9	12.9		12.6	12.6		40.4	40.4		40.4	40.4	
Actuated g/C Ratio	0.22	0.22		0.21	0.21		0.67	0.67		0.67	0.67	
v/c Ratio	0.63	0.21		0.05	0.16		0.09	0.44		0.04	0.58	
Control Delay	32.3	9.7		17.9	10.9		5.5	8.2		6.0	9.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	32.3	9.7		17.9	10.9		5.5	8.2		6.0	9.6	
LOS	C	A		B	B		A	A		A	A	
Approach Delay		24.7			12.2			8.1			9.5	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)	53	7		4	6		4	93		3	129	
Queue Length 95th (ft)	107	36		15	30		m15	212		11	240	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	465		290	435		378	1151		484	1152	
Starvation Cap Reductn	0	0		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	0.55	0.18		0.04	0.14		0.09	0.44		0.04	0.58	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 11.6

Intersection LOS: B

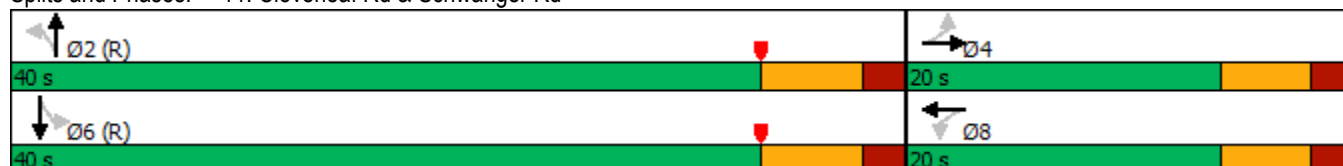
Intersection Capacity Utilization 61.7%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary
11: Cloverleaf Rd & Schwanger Rd

2033 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	25	56	12	22	34	31	470	9	20	447	189
Future Volume (veh/h)	159	25	56	12	22	34	31	470	9	20	447	189
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	167	26	32	13	23	22	33	495	8	21	471	165
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	354	156	193	321	159	152	483	1172	19	485	875	307
Arrive On Green	0.19	0.19	0.17	0.19	0.19	0.17	0.21	0.21	0.21	0.64	0.64	0.62
Sat Flow, veh/h	1435	842	1037	1258	855	818	809	1834	30	899	1369	480
Grp Volume(v), veh/h	167	0	58	13	0	45	33	0	503	21	0	636
Grp Sat Flow(s),veh/h/ln	1435	0	1879	1258	0	1673	809	0	1864	899	0	1848
Q Serve(g_s), s	6.6	0.0	1.6	0.5	0.0	1.4	2.1	0.0	14.0	0.9	0.0	11.4
Cycle Q Clear(g_c), s	8.0	0.0	1.6	2.1	0.0	1.4	13.6	0.0	14.0	14.9	0.0	11.4
Prop In Lane	1.00		0.55	1.00		0.49	1.00		0.02	1.00		0.26
Lane Grp Cap(c), veh/h	354	0	349	321	0	311	483	0	1191	485	0	1182
V/C Ratio(X)	0.47	0.00	0.17	0.04	0.00	0.14	0.07	0.00	0.42	0.04	0.00	0.54
Avail Cap(c_a), veh/h	446	0	470	402	0	418	483	0	1191	485	0	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.93	0.00	0.93	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	20.8	21.4	0.0	20.7	18.8	0.0	14.1	10.9	0.0	6.0
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.1	0.0	0.2	0.3	0.0	1.0	0.2	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(95%),veh/ln	3.9	0.0	1.2	0.3	0.0	0.9	0.9	0.0	11.2	0.3	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	21.0	21.5	0.0	20.9	19.1	0.0	15.1	11.0	0.0	7.8
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	A
Approach Vol, veh/h	225			58			536			657		
Approach Delay, s/veh	23.8			21.0			15.3			7.9		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.9			16.1			43.9			16.1		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	16.0			10.0			13.4			4.1		
Green Ext Time (p_c), s	9.5			0.3			13.3			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	13.5											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	13	25	0	7	16	500	7	12	520	7
Future Volume (vph)	5	1	13	25	0	7	16	500	7	12	520	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1698	0	0	1668	0	0	1722	1648
Flt Permitted					0.993			0.981			0.987	
Satd. Flow (perm)	0	1740	1581	0	1753	0	0	1639	0	0	1701	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		55			2				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	14	0	33	0	0	550	0	0	560	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		7.0	7.0		7.0			53.2			53.2	53.2
Actuated g/C Ratio		0.12	0.12		0.12			0.89			0.89	0.89
v/c Ratio		0.03	0.06		0.13			0.38			0.37	0.00
Control Delay		23.5	0.5		5.5			3.0			1.5	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		23.5	0.5		5.5			3.0			1.5	0.0
LOS		C	A		A			A			A	A
Approach Delay		7.4			5.5			3.0			1.5	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		2	0		0			0			0	0
Queue Length 95th (ft)		11	0		13			115			13	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		333	347		380			1452			1507	1465
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		0.02	0.04		0.09			0.38			0.37	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 2.4

Intersection LOS: A

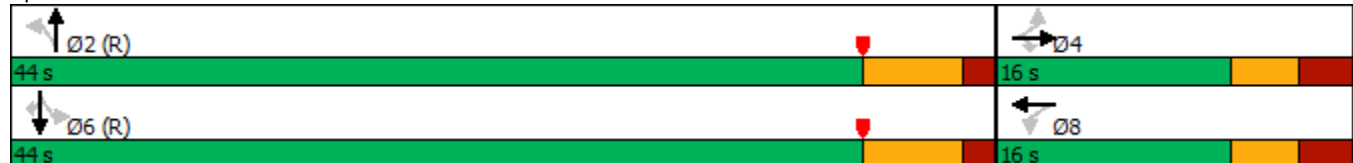
Intersection Capacity Utilization 58.4%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	13	25	0	7	16	500	7	12	520	7
Future Volume (veh/h)	5	1	13	25	0	7	16	500	7	12	520	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	7	26	0	3	17	526	7	13	547	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	173	13	72	165	0	6	77	1329	17	71	1449	1315
Arrive On Green	0.03	0.05	0.05	0.03	0.00	0.03	0.78	0.80	0.78	1.00	1.00	1.00
Sat Flow, veh/h	1393	279	1586	1130	0	130	19	1669	22	12	1819	1652
Grp Volume(v), veh/h	6	0	7	29	0	0	550	0	0	560	0	7
Grp Sat Flow(s),veh/h/ln	1672	0	1586	1260	0	0	1709	0	0	1832	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.3	1.4	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.83		1.00	0.90		0.10	0.03		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	158	0	72	150	0	0	1394	0	0	1489	0	1315
V/C Ratio(X)	0.04	0.00	0.10	0.19	0.00	0.00	0.39	0.00	0.00	0.38	0.00	0.01
Avail Cap(c_a), veh/h	365	0	304	359	0	0	1394	0	0	1489	0	1315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.80	0.00	0.80
Uniform Delay (d), s/veh	27.8	0.0	27.5	28.6	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.6	0.0	0.0	0.8	0.0	0.0	0.6	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(95%),veh/ln	0.2	0.0	0.2	0.8	0.0	0.0	1.1	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.9	0.0	28.0	29.2	0.0	0.0	2.7	0.0	0.0	0.6	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	13		29				550				567	
Approach Delay, s/veh	28.0		29.2				2.7				0.6	
Approach LOS	C		C				A				A	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	52.8		7.2		52.8		7.2					
Change Period (Y+Rc), s	6.0		5.5		6.0		5.5					
Max Green Setting (Gmax), s	38.0		10.5		38.0		10.5					
Max Q Clear Time (g_c+I1), s	7.8		2.3		2.0		3.4					
Green Ext Time (p_c), s	14.9		0.0		16.8		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	2.6											
HCM 6th LOS	A											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	303	58	28	326	142	74	172	15	132	182	189
Future Volume (vph)	213	303	58	28	326	142	74	172	15	132	182	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1845	0	1558	1624	1499
Flt Permitted	0.273			0.572			0.633			0.611		
Satd. Flow (perm)	452	1809	1435	919	1731	1592	1156	1845	0	1002	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		5				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	217	309	59	29	333	145	76	191	0	135	186	193
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	30.7	30.7	30.7	16.7	16.7	16.7	19.3	13.4		19.5	13.5	13.5
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.29	0.20		0.29	0.20	0.20
v/c Ratio	0.62	0.37	0.08	0.13	0.76	0.25	0.19	0.51		0.38	0.56	0.39
Control Delay	23.7	15.2	0.2	23.3	38.5	1.0	14.9	29.5		17.6	32.5	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	23.7	15.2	0.2	23.3	38.5	1.0	14.9	29.5		17.6	32.5	4.0
LOS	C	B	A	C	D	A	B	C		B	C	A
Approach Delay		16.8			26.9			25.3			17.9	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	59	88	0	10	135	0	21	74		38	75	0
Queue Length 95th (ft)	#135	158	0	31	#270	0	45	133		74	136	26
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	348	900	795	264	498	639	409	506		362	442	587
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.62	0.34	0.07	0.11	0.67	0.23	0.19	0.38		0.37	0.42	0.33

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 66.4

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 21.1

Intersection LOS: C

Intersection Capacity Utilization 68.0%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 No Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	303	58	28	326	142	74	172	15	132	182	189
Future Volume (veh/h)	213	303	58	28	326	142	74	172	15	132	182	189
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	217	309	53	29	333	0	76	176	12	135	186	111
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	405	837	710	340	419		365	282	19	371	307	271
Arrive On Green	0.13	0.46	0.46	0.23	0.23	0.00	0.07	0.14	0.12	0.12	0.19	0.19
Sat Flow, veh/h	1723	1837	1557	948	1794	1557	2069	2023	138	1576	1641	1450
Grp Volume(v), veh/h	217	309	53	29	333	0	76	0	188	135	186	111
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	948	1794	1557	2069	0	2161	1576	1641	1450
Q Serve(g_s), s	5.2	6.7	1.2	1.5	10.6	0.0	1.8	0.0	5.0	4.2	6.3	4.1
Cycle Q Clear(g_c), s	5.2	6.7	1.2	1.5	10.6	0.0	1.8	0.0	5.0	4.2	6.3	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	405	837	710	340	419		365	0	302	371	307	271
V/C Ratio(X)	0.54	0.37	0.07	0.09	0.80		0.21	0.00	0.62	0.36	0.61	0.41
Avail Cap(c_a), veh/h	405	969	821	408	547		496	0	623	396	473	418
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	10.8	9.3	18.4	21.9	0.0	19.8	0.0	24.6	18.6	22.6	21.7
Incr Delay (d2), s/veh	1.4	0.1	0.0	0.0	4.5	0.0	0.3	0.0	2.1	0.6	1.9	1.0
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(95%),veh/ln	3.1	3.8	0.6	0.5	7.8	0.0	1.6	0.0	4.7	2.6	4.2	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.4	10.9	9.3	18.4	26.4	0.0	20.1	0.0	26.7	19.2	24.5	22.7
LnGrp LOS	B	B	A	B	C		C	A	C	B	C	C
Approach Vol, veh/h	579				362			264			432	
Approach Delay, s/veh	12.5				25.7			24.8			22.4	
Approach LOS	B				C			C			C	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	19.7	13.1	14.5		33.2	10.2	17.4				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	7.7	13.1	6.7	7.0		9.2	4.3	8.8				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.5		0.1	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	20.0
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2033 No Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	51	34	16	34	49	20	184	7	26	187	35
Future Volume (vph)	40	51	34	16	34	49	20	184	7	26	187	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1680	0	0	1633	0	0	1772	0	0	1850	0
Flt Permitted		0.984			0.992			0.995			0.995	
Satd. Flow (perm)	0	1680	0	0	1633	0	0	1772	0	0	1850	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	130	0	0	103	0	0	220	0	0	258	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	37.5%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

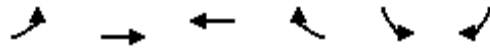
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	51	34	16	34	49	20	184	7	26	187	35
Future Vol, veh/h	40	51	34	16	34	49	20	184	7	26	187	35
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	42	53	35	17	35	51	21	192	7	27	195	36
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.5	8.9	10	10.2
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	32%	16%	10%
Vol Thru, %	87%	41%	34%	75%
Vol Right, %	3%	27%	49%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	211	125	99	248
LT Vol	20	40	16	26
Through Vol	184	51	34	187
RT Vol	7	34	49	35
Lane Flow Rate	220	130	103	258
Geometry Grp	1	1	1	1
Degree of Util (X)	0.298	0.188	0.142	0.337
Departure Headway (Hd)	4.882	5.202	4.949	4.697
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	730	684	717	760
Service Time	2.951	3.284	3.034	2.763
HCM Lane V/C Ratio	0.301	0.19	0.144	0.339
HCM Control Delay	10	9.5	8.9	10.2
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	1.2	0.7	0.5	1.5

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2033 No Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	408	444	35	33	3
Future Volume (vph)	3	408	444	35	33	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1793	0	1660	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1754	1828	1793	0	1660	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	425	499	0	37	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	408	444	35	33	3
Future Vol, veh/h	3	408	444	35	33	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	425	463	36	34	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	499	0	-	0	912	481
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	431	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	831	-	-	-	306	603
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	831	-	-	-	305	603
Mov Cap-2 Maneuver	-	-	-	-	454	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	713	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.4		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	831	-	-	-	464	
HCM Lane V/C Ratio	0.004	-	-	-	0.081	
HCM Control Delay (s)	9.3	-	-	-	13.4	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

APPENDIX L18

2033 BUILD CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↘	
Traffic Volume (vph)	487	82	107	453	150	164
Future Volume (vph)	487	82	107	453	150	164
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1687	0	1662	1766	1532	0
Flt Permitted			0.172		0.977	
Satd. Flow (perm)	1687	0	301	1766	1532	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	15					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	632	0	119	503	349	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	34.0		12.0	46.0	24.0	
Total Split (%)	48.6%		17.1%	65.7%	34.3%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	31.2		42.0	40.8	18.8	
Actuated g/C Ratio	0.45		0.60	0.58	0.27	
v/c Ratio	0.83		0.36	0.49	0.85	
Control Delay	30.4		7.8	7.6	46.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	30.4		7.8	7.6	46.0	
LOS	C		A	A	D	
Approach Delay	30.4			7.6	46.0	
Approach LOS	C			A	D	
Queue Length 50th (ft)	240		15	70	142	
Queue Length 95th (ft)	#444		34	104	#281	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	759		336	1029	411	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.83		0.35	0.49	0.85	

Intersection Summary

Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 25.0	Intersection LOS: C
Intersection Capacity Utilization 70.1%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: Maytown Rd & SR 0230

 Ø1 12 s	 Ø2 (R) 34 s	 Ø4 24 s
 Ø6 (R) 46 s		

HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 Build
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	487	82	107	453	150	164
Future Volume (veh/h)	487	82	107	453	150	164
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	541	85	119	503	167	182
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	641	101	345	1150	197	215
Arrive On Green	0.46	0.45	0.16	1.00	0.25	0.24
Sat Flow, veh/h	1390	218	1846	1927	774	844
Grp Volume(v), veh/h	0	626	119	503	350	0
Grp Sat Flow(s),veh/h/ln	0	1608	1846	1927	1623	0
Q Serve(g_s), s	0.0	24.1	2.0	0.0	14.4	0.0
Cycle Q Clear(g_c), s	0.0	24.1	2.0	0.0	14.4	0.0
Prop In Lane		0.14	1.00		0.48	0.52
Lane Grp Cap(c), veh/h	0	741	345	1150	413	0
V/C Ratio(X)	0.00	0.84	0.34	0.44	0.85	0.00
Avail Cap(c_a), veh/h	0	741	411	1150	436	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	16.7	11.5	0.0	25.0	0.0
Incr Delay (d2), s/veh	0.0	11.3	0.6	1.2	17.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	15.1	1.2	0.7	11.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	28.0	12.1	1.2	42.6	0.0
LnGrp LOS	A	C	B	A	D	A
Approach Vol, veh/h	626			622	350	
Approach Delay, s/veh	28.0			3.3	42.6	
Approach LOS	C			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.5	37.5		23.0		47.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	4.0	26.1		16.4		2.0
Green Ext Time (p_c), s	0.1	1.3		0.5		13.7
Intersection Summary						
HCM 6th Ctrl Delay			21.6			
HCM 6th LOS			C			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	663	1	0	605	54	0	0	2	66	0	89
Future Volume (vph)	45	663	1	0	605	54	0	0	2	66	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1742	0	1843	1614	0	0	1070	0	1771	1389	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1640	1742	0	1843	1614	0	0	1070	0	1771	1389	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1		1	1		1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	7%	0%	0%	9%	10%	0%	0%	50%	0%	0%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	746	0	0	741	0	0	2	0	74	100	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.5%

ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	663	1	0	605	54	0	0	2	66	0	89
Future Vol, veh/h	45	663	1	0	605	54	0	0	2	66	0	89
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	8	7	0	0	9	10	0	0	50	0	0	18
Mvmt Flow	51	745	1	0	680	61	0	0	2	74	0	100

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	741	0	0	746	0	0	1610	1589	747	1561	1559	712
Stage 1	-	-	-	-	-	-	848	848	-	711	711	-
Stage 2	-	-	-	-	-	-	762	741	-	850	848	-
Critical Hdwy	3.9	-	-	5.5	-	-	6.7	6.1	6.5	6.5	5.9	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3.1	-	-	3	-	-	3	4	3.6	3	4	3.462
Pot Cap-1 Maneuver	704	-	-	515	-	-	109	130	368	128	147	430
Stage 1	-	-	-	-	-	-	437	418	-	537	495	-
Stage 2	-	-	-	-	-	-	485	462	-	457	438	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	704	-	-	515	-	-	79	121	368	120	136	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	121	-	120	136	-
Stage 1	-	-	-	-	-	-	406	388	-	498	495	-
Stage 2	-	-	-	-	-	-	372	462	-	421	406	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	14.8	40.9
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	368	704	-	-	515	-	-	120	430
HCM Lane V/C Ratio	0.006	0.072	-	-	-	-	-	0.618	0.233
HCM Control Delay (s)	14.8	10.5	-	-	0	-	-	74.5	15.9
HCM Lane LOS	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	3.1	0.9

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	593	46	65	544	6	107	2	75	4	3	2
Future Volume (vph)	3	593	46	65	544	6	107	2	75	4	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1667	1552	1541	1558	1608	1645	1516	0	1761	1842	0
Flt Permitted	0.436			0.253			0.754			0.702		
Satd. Flow (perm)	758	1667	1552	410	1558	1608	1302	1516	0	1302	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			45			83			2
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	8%	2%	2%	10%	0%	3%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	659	51	72	604	7	119	85	0	4	5	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	40.0	40.0	40.0	13.0	53.0	53.0	17.0	17.0		17.0	17.0	
Total Split (%)	57.1%	57.1%	57.1%	18.6%	75.7%	75.7%	24.3%	24.3%		24.3%	24.3%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	42.2	42.2	42.2	52.2	52.1	52.1	10.9	10.9		10.7	10.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.75	0.74	0.74	0.16	0.16		0.15	0.15	
v/c Ratio	0.01	0.66	0.05	0.17	0.52	0.01	0.59	0.28		0.02	0.02	
Control Delay	6.7	11.2	0.1	1.8	3.5	0.0	39.6	9.7		24.5	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	11.2	0.1	1.8	3.5	0.0	39.6	9.7		24.5	21.0	
LOS	A	B	A	A	A	A	D	A		C	C	
Approach Delay		10.4			3.3			27.1			22.6	
Approach LOS		B			A			C			C	
Queue Length 50th (ft)	1	102	0	7	71	0	47	1		1	1	
Queue Length 95th (ft)	m1	m129	m0	1	12	m0	97	35		9	10	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	457	1004	987	443	1158	1207	225	330		225	320	
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	0.01	0.66	0.05	0.16	0.52	0.01	0.53	0.26		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 29 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 9.6

Intersection LOS: A

Intersection Capacity Utilization 69.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	593	46	65	544	6	107	2	75	4	3	2
Future Volume (veh/h)	3	593	46	65	544	6	107	2	75	4	3	2
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	2061	1947	2032	1722	1609	1820	1944	1986	1929	2024	2104	2024
Adj Flow Rate, veh/h	3	659	35	72	604	6	119	2	45	4	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	8	2	2	10	0	3	0	4	0	0	0
Cap, veh/h	644	1178	1042	606	1161	1112	287	9	203	260	148	99
Arrive On Green	1.00	1.00	1.00	0.10	1.00	1.00	0.13	0.13	0.11	0.13	0.13	0.11
Sat Flow, veh/h	894	1947	1722	1640	1609	1542	1461	72	1615	1465	1176	784
Grp Volume(v), veh/h	3	659	35	72	604	6	119	0	47	4	0	5
Grp Sat Flow(s),veh/h/ln	894	1947	1722	1640	1609	1542	1461	0	1687	1465	0	1959
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	5.4	0.0	1.8	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.0	0.0	0.0	5.4	0.0	1.8	1.4	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	644	1178	1042	606	1161	1112	287	0	212	260	0	246
V/C Ratio(X)	0.00	0.56	0.03	0.12	0.52	0.01	0.42	0.00	0.22	0.02	0.00	0.02
Avail Cap(c_a), veh/h	644	1178	1042	720	1161	1112	355	0	292	329	0	339
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)	1.00	1.00	1.00	0.89	0.89	0.89	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.3	0.0	0.0	29.1	0.0	28.0	28.0	0.0	27.0
Incr Delay (d2), s/veh	0.0	1.9	0.1	0.1	1.5	0.0	1.0	0.0	0.5	0.0	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(95%),veh/ln	0.0	1.1	0.0	0.4	0.9	0.0	3.5	0.0	1.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.9	0.1	3.4	1.5	0.0	30.1	0.0	28.5	28.0	0.0	27.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	697		682			166			9			
Approach Delay, s/veh	1.8		1.7			29.6			27.4			
Approach LOS	A		A			C			C			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	8.2	48.1	13.7		56.3		13.7					
Change Period (Y+Rc), s	5.5	6.8	* 5.9		6.8		* 5.9					
Max Green Setting (Gmax), s	7.5	33.2	* 11		46.2		* 11					
Max Q Clear Time (g_c+I1), s	3.5	2.5	3.9		2.5		7.9					
Green Ext Time (p_c), s	0.0	0.9	0.0		0.7		0.1					

Intersection Summary

HCM 6th Ctrl Delay 4.9
HCM 6th LOS A

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	517	14	5	581	13	10	0	15	6	0	9
Future Volume (vph)	27	517	14	5	581	13	10	0	15	6	0	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1660	0	1744	1654	1445	0	1731	0	1719	1501	0
Flt Permitted	0.343			0.450				0.863				
Satd. Flow (perm)	605	1660	0	826	1654	1415	0	1522	0	1809	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				126		139			361	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	0%	0%	11%	8%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	571	0	5	625	14	0	27	0	6	10	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	56.0		45.0	45.0	45.0	14.0	14.0		14.0	14.0	
Total Split (%)	15.7%	80.0%		64.3%	64.3%	64.3%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	60.6	62.9		58.5	58.5	58.5		7.0		7.1	7.1	
Actuated g/C Ratio	0.87	0.90		0.84	0.84	0.84		0.10		0.10	0.10	
v/c Ratio	0.05	0.38		0.01	0.45	0.01		0.10		0.03	0.02	
Control Delay	0.8	3.0		3.6	5.1	0.0		0.7		28.5	0.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	0.8	3.0		3.6	5.1	0.0		0.7		28.5	0.1	
LOS	A	A		A	A	A		A		C	A	
Approach Delay		2.9			5.0			0.7			10.8	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	0	0		0	0	0		0		2	0	
Queue Length 95th (ft)	m1	125		m1	127	m0		0		13	0	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	623	1493		691	1383	1204		324		242	514	
Starvation Cap Reductn	0	0		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	0.05	0.38		0.01	0.45	0.01		0.08		0.02	0.02	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 7 (10%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 4.0

Intersection LOS: A

Intersection Capacity Utilization 48.8%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230

 Ø1	 Ø2 (R)	 Ø4
11 s	45 s	14 s
 Ø6 (R)		 Ø8
56 s		14 s

HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2033 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	517	14	5	581	13	10	0	15	6	0	9
Future Volume (veh/h)	27	517	14	5	581	13	10	0	15	6	0	9
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	0.98		0.99	0.99		0.99
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	1711	1626	1711	1949	1793	1835	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	29	556	15	5	625	14	11	0	15	6	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	6	0	0	11	8	0	0	0	0	0	0
Cap, veh/h	677	1289	35	734	1292	1120	91	0	24	163	0	61
Arrive On Green	0.07	1.00	1.00	1.00	1.00	1.00	0.03	0.00	0.03	0.04	0.00	0.03
Sat Flow, veh/h	1629	1576	43	876	1793	1554	452	0	616	1360	0	1539
Grp Volume(v), veh/h	29	0	571	5	625	14	26	0	0	6	0	1
Grp Sat Flow(s),veh/h/ln	1629	0	1619	876	1793	1554	1068	0	0	1360	0	1539
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.42		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	677	0	1324	734	1292	1120	100	0	0	163	0	61
V/C Ratio(X)	0.04	0.00	0.43	0.01	0.48	0.01	0.26	0.00	0.00	0.04	0.00	0.02
Avail Cap(c_a), veh/h	774	0	1324	734	1292	1120	241	0	0	292	0	207
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(l)	0.71	0.00	0.71	0.88	0.88	0.88	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	33.9	0.0	0.0	32.4	0.0	32.8
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.0	1.1	0.0	1.4	0.0	0.0	0.1	0.0	0.1
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(95%),veh/ln	0.0	0.0	0.5	0.0	0.7	0.0	0.9	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	0.7	0.0	1.1	0.0	35.2	0.0	0.0	32.5	0.0	32.9
LnGrp LOS	A	A	A	A	A	A	D	A	A	C	A	C
Approach Vol, veh/h	600				644				26			
Approach Delay, s/veh	0.8				1.1				35.2			
Approach LOS	A				A				D			
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	6.8	55.8	7.4		62.6		7.4					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	5.5	38.6	8.4		49.6		8.4					
Max Q Clear Time (g_c+I1), s	2.8	2.5	2.7		2.5		3.7					
Green Ext Time (p_c), s	0.0	0.8	0.0		0.7		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	1.8											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	481	5	11	475	35	63	32	37	59	27	52
Future Volume (vph)	40	481	5	11	475	35	63	32	37	59	27	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1684	1672	0	1246	1588	0	1248	1509	0	0	1835	0
Flt Permitted	0.420			0.437			0.643				0.828	
Satd. Flow (perm)	745	1672	0	573	1588	0	844	1509	0	0	1551	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			9			40			44	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	5%	100%	30%	6%	10%	26%	4%	9%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	522	0	12	549	0	68	74	0	0	148	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	45.0	45.0		45.0	45.0		25.0	25.0		25.0	25.0	
Total Split (%)	64.3%	64.3%		64.3%	64.3%		35.7%	35.7%		35.7%	35.7%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	51.6	51.6		51.6	51.6		11.8	11.8			11.8	
Actuated g/C Ratio	0.74	0.74		0.74	0.74		0.17	0.17			0.17	
v/c Ratio	0.08	0.42		0.03	0.47		0.48	0.26			0.50	
Control Delay	1.1	1.6		5.1	7.3		36.3	15.1			23.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	1.1	1.6		5.1	7.3		36.3	15.1			23.4	
LOS	A	A		A	A		D	B			C	
Approach Delay		1.6			7.3			25.3			23.4	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	1	8		1	89		27	13			41	
Queue Length 95th (ft)	3	19		8	204		59	41			83	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	549	1232		422	1172		241	459			474	
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	0.08	0.42		0.03	0.47		0.28	0.16			0.31	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 8.5

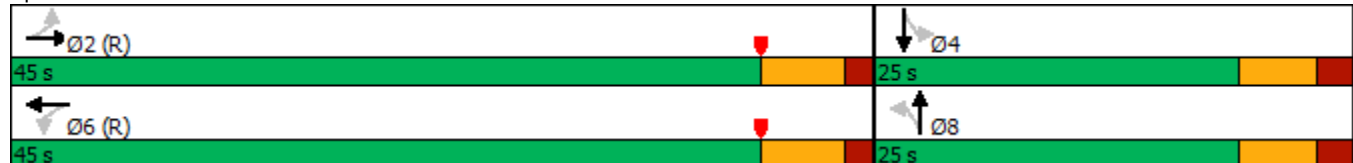
Intersection LOS: A

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary

13: Sheaffer Rd & SR 0230

2033 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	481	5	11	475	35	63	32	37	59	27	52
Future Volume (veh/h)	40	481	5	11	475	35	63	32	37	59	27	52
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	1750	1680	346	1485	1826	1770	1385	1694	1623	1949	2027	1864
Adj Flow Rate, veh/h	43	517	4	12	511	37	68	34	18	63	29	38
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	5	100	30	6	10	26	4	9	0	0	6
Cap, veh/h	589	1207	9	610	1221	88	234	139	73	156	61	58
Arrive On Green	1.00	1.00	1.00	0.73	0.73	0.71	0.13	0.13	0.12	0.12	0.13	0.12
Sat Flow, veh/h	804	1664	13	699	1683	122	986	1041	551	595	459	435
Grp Volume(v), veh/h	43	0	521	12	0	548	68	0	52	130	0	0
Grp Sat Flow(s),veh/h/ln	804	0	1677	699	0	1805	986	0	1592	1490	0	0
Q Serve(g_s), s	0.7	0.0	0.0	0.3	0.0	8.4	0.0	0.0	2.1	4.1	0.0	0.0
Cycle Q Clear(g_c), s	9.1	0.0	0.0	0.3	0.0	8.4	4.5	0.0	2.1	6.1	0.0	0.0
Prop In Lane	1.00		0.01	1.00		0.07	1.00		0.35	0.48		0.29
Lane Grp Cap(c), veh/h	589	0	1217	610	0	1309	234	0	212	253	0	0
V/C Ratio(X)	0.07	0.00	0.43	0.02	0.00	0.42	0.29	0.00	0.25	0.51	0.00	0.00
Avail Cap(c_a), veh/h	589	0	1217	610	0	1309	385	0	455	502	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(l)	0.93	0.00	0.93	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.8	0.0	0.0	2.7	0.0	3.8	28.2	0.0	27.4	29.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.0	0.1	0.0	1.0	0.7	0.0	0.6	1.6	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(95%),veh/ln	0.1	0.0	0.6	0.1	0.0	3.5	1.9	0.0	1.4	3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.0	0.0	1.0	2.7	0.0	4.8	28.9	0.0	27.9	31.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	A
Approach Vol, veh/h	564			560			120			130		
Approach Delay, s/veh	1.0			4.7			28.5			31.1		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	55.7			14.3			55.7			14.3		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 39			19.0			* 39			19.0		
Max Q Clear Time (g_c+I1), s	2.0			8.1			10.4			6.5		
Green Ext Time (p_c), s	15.9			0.3			14.9			0.3		

Intersection Summary

HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

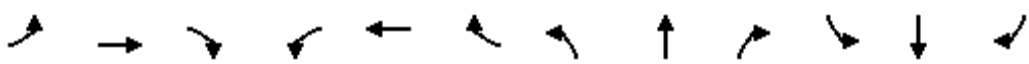
Notes

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

Lanes, Volumes, Timings

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↗	↗			↗	↗
Traffic Volume (vph)	0	0	0	430	0	92	615	172	0	0	224	59
Future Volume (vph)	0	0	0	430	0	92	615	172	0	0	224	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1546	1145	1544	1424	0	0	1528	1523
Flt Permitted					0.950		0.425					
Satd. Flow (perm)	0	0	0	0	1546	1145	691	1424	0	0	1528	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	8%	0%	26%	6%	21%	2%	2%	15%	15%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	448	96	641	179	0	0	233	61
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				21.0	21.0	21.0	17.0	39.0			22.0	22.0
Total Split (%)				35.0%	35.0%	35.0%	28.3%	65.0%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					16.5	16.5	32.9	32.9			15.8	15.8
Actuated g/C Ratio					0.28	0.28	0.56	0.56			0.27	0.27
v/c Ratio					1.03	0.22	1.15	0.23			0.57	0.12
Control Delay					78.4	2.1	101.6	7.4			24.7	0.5
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					78.4	2.1	101.6	7.4			24.7	0.5
LOS					E	A	F	A			C	A
Approach Delay					64.9			81.0			19.7	
Approach LOS					E			F			B	
Queue Length 50th (ft)					~183	0	~196	29			71	0
Queue Length 95th (ft)					#337	9	#457	56			132	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 Build
 AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					433	439	559	822			441	550
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					1.03	0.22	1.15	0.22			0.53	0.11

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 64.9

Intersection LOS: E

Intersection Capacity Utilization 137.5%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	430	0	92	615	172	0	0	224	59
Future Volume (veh/h)	0	0	0	430	0	92	615	172	0	0	224	59
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1761	1875	1505	1693	1483	0	0	1661	1728
Adj Flow Rate, veh/h				448	0	0	641	179	0	0	233	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				8	0	26	6	21	0	0	15	15
Cap, veh/h				522	0		587	797	0	0	387	
Arrive On Green				0.27	0.00	0.00	0.21	0.54	0.00	0.00	0.23	0.00
Sat Flow, veh/h				1785	0	1275	1613	1483	0	0	1661	1464
Grp Volume(v), veh/h				448	0	0	641	179	0	0	233	0
Grp Sat Flow(s),veh/h/ln				1785	0	1275	1613	1483	0	0	1661	1464
Q Serve(g_s), s				13.3	0.0	0.0	12.0	3.5	0.0	0.0	7.0	0.0
Cycle Q Clear(g_c), s				13.3	0.0	0.0	12.0	3.5	0.0	0.0	7.0	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				522	0		587	797	0	0	387	
V/C Ratio(X)				0.86	0.00		1.09	0.22	0.00	0.00	0.60	
Avail Cap(c_a), veh/h				528	0		587	903	0	0	506	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.1	0.0	0.0	15.0	6.8	0.0	0.0	19.1	0.0
Incr Delay (d2), s/veh				13.2	0.0	0.0	64.4	0.5	0.0	0.0	5.4	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
%ile BackOfQ(95%),veh/ln				11.4	0.0	0.0	22.2	1.6	0.0	0.0	5.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.3	0.0	0.0	79.4	7.3	0.0	0.0	24.5	0.0
LnGrp LOS				C	A		F	A	A	A	C	
Approach Vol, veh/h					448			820			233	
Approach Delay, s/veh					32.3			63.6			24.5	
Approach LOS					C			E			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.0			17.0	18.0		20.8				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		33.0			11.0	16.0		15.5				
Max Q Clear Time (g_c+I1), s		5.5			14.0	9.0		15.3				
Green Ext Time (p_c), s		3.9			0.0	2.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				48.2								
HCM 6th LOS				D								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	2	316	0	0	0	0	754	682	112	533	0
Future Volume (vph)	33	2	316	0	0	0	0	754	682	112	533	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1600	1454	0	0	0	0	1628	0	1588	1686	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	16%	0%	9%	2%	2%	2%	2%	9%	4%	11%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	37	336	0	0	0	0	1528	0	119	567	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 137.5% ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2033 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	33	2	316	0	0	0	0	754	682	112	533	0
Future Vol, veh/h	33	2	316	0	0	0	0	754	682	112	533	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	0	9	2	2	2	2	9	4	11	10	2
Mvmt Flow	35	2	336	0	0	0	0	802	726	119	567	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1607	1607	567	-	0	0	802	0	0
Stage 1	805	805	-	-	-	-	-	-	-
Stage 2	802	802	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.99	-	-	-	4	-	-
Critical Hdwy Stg 1	4.96	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.96	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.2	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	108	139	558	0	-	-	660	-	0
Stage 1	531	455	-	0	-	-	-	-	0
Stage 2	533	456	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	89	0	558	-	-	-	660	-	-
Mov Cap-2 Maneuver	89	0	-	-	-	-	-	-	-
Stage 1	531	0	-	-	-	-	-	-	-
Stage 2	437	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.8	0	2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	89	558	660	-
HCM Lane V/C Ratio	-	-	0.418	0.602	0.181	-
HCM Control Delay (s)	-	-	71.9	20.7	11.7	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	1.7	4	0.7	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	26	0	1417	841	5
Future Volume (vph)	6	26	0	1417	841	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1620	0	0	1734	1652	0
Flt Permitted	0.990					
Satd. Flow (perm)	1620	0	0	1734	1652	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	10%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	0	0	1574	940	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	84.6%			ICU Level of Service E		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	26	0	1417	841	5
Future Vol, veh/h	6	26	0	1417	841	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	7	10	0
Mvmt Flow	7	29	0	1574	934	6

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2511	937	940	0	-	0
Stage 1	937	-	-	-	-	-
Stage 2	1574	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	33	337	625	-	-	-
Stage 1	424	-	-	-	-	-
Stage 2	203	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	33	337	625	-	-	-
Mov Cap-2 Maneuver	33	-	-	-	-	-
Stage 1	424	-	-	-	-	-
Stage 2	203	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	45.3	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	625	-	124	-	-
HCM Lane V/C Ratio	-	-	0.287	-	-
HCM Control Delay (s)	0	-	45.3	-	-
HCM Lane LOS	A	-	E	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	440	20	133	9	13	78	55	900	9	11	674	195
Future Volume (vph)	440	20	133	9	13	78	55	900	9	11	674	195
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1558	0	1391	1565	0	1500	1616	0	1628	1575	0
Flt Permitted	0.692			0.643			0.101			0.101		
Satd. Flow (perm)	1168	1558	0	940	1565	0	159	1616	0	173	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		148			87			1			34	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	489	170	0	10	101	0	61	1010	0	12	966	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0		25.0	25.0		45.0	45.0		45.0	45.0	
Total Split (%)	35.7%	35.7%		35.7%	35.7%		64.3%	64.3%		64.3%	64.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	20.0	20.0		20.0	20.0		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.56	0.56		0.56	0.56	
v/c Ratio	1.47	0.31		0.04	0.20		0.69	1.11		0.12	1.07	
Control Delay	251.5	6.8		18.7	7.3		44.8	77.6		10.9	68.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	251.5	6.8		18.7	7.3		44.8	77.6		10.9	68.6	
LOS	F	A		B	A		D	E		B	E	
Approach Delay		188.4			8.3			75.7			67.9	
Approach LOS		F			A			E			E	
Queue Length 50th (ft)	~296	7		3	4		7	~513		2	~466	
Queue Length 95th (ft)	#466	49		13	37		m#26	#724		11	#687	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	333	550		268	509		89	912		97	903	
Starvation Cap Reductn	0	0		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	1.47	0.31		0.04	0.20		0.69	1.11		0.12	1.07	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.47

Intersection Signal Delay: 96.7

Intersection LOS: F

Intersection Capacity Utilization 91.7%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

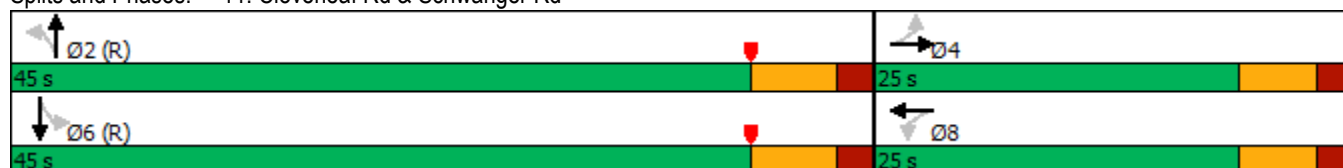
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2033 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	20	133	9	13	78	55	900	9	11	674	195
Future Volume (veh/h)	440	20	133	9	13	78	55	900	9	11	674	195
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	489	22	148	10	14	87	61	1000	10	12	749	217
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	417	66	443	316	58	362	113	995	10	103	760	220
Arrive On Green	0.29	0.29	0.27	0.29	0.29	0.27	1.00	1.00	1.00	0.56	0.56	0.55
Sat Flow, veh/h	1352	231	1552	1017	204	1268	559	1763	18	582	1347	390
Grp Volume(v), veh/h	489	0	170	10	0	101	61	0	1010	12	0	966
Grp Sat Flow(s),veh/h/ln	1352	0	1783	1017	0	1472	559	0	1781	582	0	1737
Q Serve(g_s), s	16.3	0.0	5.3	0.5	0.0	3.7	1.3	0.0	39.5	0.0	0.0	38.2
Cycle Q Clear(g_c), s	20.0	0.0	5.3	5.9	0.0	3.7	39.5	0.0	39.5	39.5	0.0	38.2
Prop In Lane	1.00		0.87	1.00		0.86	1.00		0.01	1.00		0.22
Lane Grp Cap(c), veh/h	417	0	509	316	0	421	113	0	1005	103	0	980
V/C Ratio(X)	1.17	0.00	0.33	0.03	0.00	0.24	0.54	0.00	1.01	0.12	0.00	0.99
Avail Cap(c_a), veh/h	417	0	509	316	0	421	113	0	1005	103	0	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.61	0.00	0.61	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.9	0.0	20.1	22.1	0.0	19.5	19.6	0.0	0.0	35.0	0.0	15.1
Incr Delay (d2), s/veh	100.3	0.0	0.4	0.0	0.0	0.3	10.9	0.0	23.4	2.3	0.0	25.5
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(95%),veh/ln	27.9	0.0	3.8	0.2	0.0	2.2	2.1	0.0	9.9	0.5	0.0	25.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	129.2	0.0	20.5	22.1	0.0	19.8	30.5	0.0	23.4	37.3	0.0	40.6
LnGrp LOS	F	A	C	C	A	B	C	A	F	D	A	D
Approach Vol, veh/h	659			111			1071			978		
Approach Delay, s/veh	101.1			20.0			23.8			40.6		
Approach LOS	F			C			C			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			25.0			45.0			25.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	38.5			19.0			38.5			19.0		
Max Q Clear Time (g_c+I1), s	41.5			22.0			40.2			7.9		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	47.6											
HCM 6th LOS	D											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	36	2	900	7	64	729	7
Future Volume (vph)	36	0	17	17	1	36	2	900	7	64	729	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1628	0	0	1561	0	0	1617	1648
Flt Permitted		0.951			0.880			0.999			0.874	
Satd. Flow (perm)	0	1655	1581	0	1456	0	0	1560	0	0	1419	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		38			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	57	0	0	947	0	0	826	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.8	8.8		8.6			58.3			58.3	58.3
Actuated g/C Ratio		0.13	0.13		0.12			0.83			0.83	0.83
v/c Ratio		0.18	0.08		0.27			0.73			0.70	0.01
Control Delay		28.6	2.8		16.7			10.9			12.0	0.6
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		28.6	2.8		16.7			10.9			12.0	0.6
LOS		C	A		B			B			B	A
Approach Delay		20.3			16.7			10.9			12.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		15	0		7			203			278	0
Queue Length 95th (ft)		39	5		36			#584			m286	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		295	320		291			1299			1182	1379
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		0.13	0.06		0.20			0.73			0.70	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 11.8

Intersection LOS: B

Intersection Capacity Utilization 111.2%

ICU Level of Service H

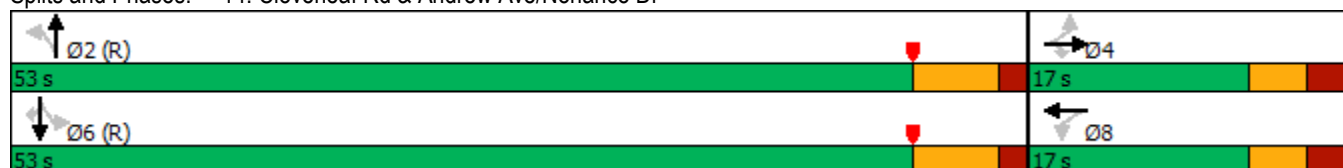
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	36	2	900	7	64	729	7
Future Volume (veh/h)	36	0	17	17	1	36	2	900	7	64	729	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	38	2	938	7	67	759	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	228	0	125	93	10	72	52	1273	9	122	1178	1297
Arrive On Green	0.06	0.00	0.08	0.06	0.08	0.06	0.77	0.79	0.77	1.00	1.00	1.00
Sat Flow, veh/h	1584	0	1586	324	130	908	0	1622	12	85	1501	1652
Grp Volume(v), veh/h	38	0	18	57	0	0	947	0	0	826	0	7
Grp Sat Flow(s),veh/h/ln	1584	0	1586	1362	0	0	1634	0	0	1586	0	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.7	3.0	0.0	0.0	21.2	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	0.32		0.67	0.00		0.01	0.08		1.00
Lane Grp Cap(c), veh/h	205	0	125	156	0	0	1311	0	0	1278	0	1297
V/C Ratio(X)	0.18	0.00	0.14	0.37	0.00	0.00	0.72	0.00	0.00	0.65	0.00	0.01
Avail Cap(c_a), veh/h	337	0	283	308	0	0	1311	0	0	1278	0	1297
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	30.8	0.0	30.0	31.6	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.4	0.0	0.0	3.5	0.0	0.0	0.2	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(95%),veh/ln	1.1	0.0	0.5	1.8	0.0	0.0	6.8	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	30.5	33.0	0.0	0.0	7.4	0.0	0.0	0.2	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56		57			947			833			
Approach Delay, s/veh	31.0		33.0			7.4			0.2			
Approach LOS	C		C			A			A			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	60.0		10.0			60.0			10.0			
Change Period (Y+Rc), s	6.0		5.5			6.0			5.5			
Max Green Setting (Gmax), s	47.0		11.5			47.0			11.5			
Max Q Clear Time (g_c+I1), s	23.2		3.5			2.0			5.0			
Green Ext Time (p_c), s	20.3		0.1			31.4			0.1			
Intersection Summary												
HCM 6th Ctrl Delay			5.7									
HCM 6th LOS			A									

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	314	282	56	48	265	218	89	397	47	124	238	196
Future Volume (vph)	314	282	56	48	265	218	89	397	47	124	238	196
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	1660	1113	1194	1649	1561	1637	1689	0	1500	1509	1388
Flt Permitted	0.285			0.577			0.518			0.184		
Satd. Flow (perm)	446	1660	1088	724	1649	1561	893	1689	0	290	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		7				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	334	300	60	51	282	232	95	472	0	132	253	209
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	31.5	31.5	31.5	16.4	16.4	16.4	27.8	21.7		27.8	21.7	21.7
Actuated g/C Ratio	0.42	0.42	0.42	0.22	0.22	0.22	0.37	0.29		0.37	0.29	0.29
v/c Ratio	1.05	0.43	0.11	0.33	0.79	0.44	0.23	0.96		0.57	0.58	0.37
Control Delay	88.8	19.0	0.4	32.7	46.5	6.6	14.9	63.0		24.3	31.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	88.8	19.0	0.4	32.7	46.5	6.6	14.9	63.0		24.3	31.3	4.8
LOS	F	B	A	C	D	A	B	E		C	C	A
Approach Delay		51.0			28.9			55.0			20.4	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	~140	104	0	21	132	0	27	~254		39	111	0
Queue Length 95th (ft)	#347	171	0	54	#248	51	55	#437		#78	189	39

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	318	732	563	174	397	557	408	490		235	433	564
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.05	0.41	0.11	0.29	0.71	0.42	0.23	0.96		0.56	0.58	0.37

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 75.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 39.2

Intersection LOS: D

Intersection Capacity Utilization 84.6%

ICU Level of Service E

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary

17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	282	56	48	265	218	89	397	47	124	238	196
Future Volume (veh/h)	314	282	56	48	265	218	89	397	47	124	238	196
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	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	334	300	47	51	282	0	95	422	48	132	253	179
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	354	678	479	240	338		407	488	55	292	454	402
Arrive On Green	0.13	0.40	0.40	0.39	0.39	0.00	0.07	0.27	0.25	0.10	0.30	0.30
Sat Flow, veh/h	1641	1709	1206	735	1724	1532	1988	1822	207	1522	1528	1352
Grp Volume(v), veh/h	334	300	47	51	282	0	95	0	470	132	253	179
Grp Sat Flow(s),veh/h/ln	1641	1709	1206	735	1724	1532	1988	0	2029	1522	1528	1352
Q Serve(g_s), s	9.5	9.6	1.8	3.7	11.0	0.0	2.5	0.0	16.5	4.5	10.4	8.0
Cycle Q Clear(g_c), s	9.5	9.6	1.8	3.7	11.0	0.0	2.5	0.0	16.5	4.5	10.4	8.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	354	678	479	240	338		407	0	543	292	454	402
V/C Ratio(X)	0.94	0.44	0.10	0.21	0.83		0.23	0.00	0.86	0.45	0.56	0.45
Avail Cap(c_a), veh/h	354	756	533	274	416		478	0	585	302	454	402
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	16.5	14.1	19.4	21.6	0.0	17.6	0.0	26.1	18.3	22.1	21.2
Incr Delay (d2), s/veh	33.4	0.2	0.0	0.2	9.7	0.0	0.3	0.0	12.2	1.1	1.5	0.8
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(95%),veh/ln	11.8	5.9	0.8	1.0	7.4	0.0	2.0	0.0	14.6	2.7	6.5	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.8	16.6	14.2	19.5	31.3	0.0	17.9	0.0	38.3	19.4	23.6	22.0
LnGrp LOS	E	B	B	B	C		B	A	D	B	C	C
Approach Vol, veh/h	681			333			565			564		
Approach Delay, s/veh	36.1			29.5			34.9			22.1		
Approach LOS	D			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	20.1	13.5	26.0		35.1	11.3	28.2				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	13.5	7.0	18.5		12.1	5.0	12.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5		0.1	0.1	1.4				

Intersection Summary

HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	6	0	0	118	10	841	13	126	551	41
Future Volume (vph)	0	0	6	0	0	118	10	841	13	126	551	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Storage Length (ft)	0		0	0		0	75		150	325		175
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1611	0	0	1611	1752	1726	1567	1787	1745	1599
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	0	1611	0	0	1611	1752	1726	1567	1787	1745	1599
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	9%	2%	2%	10%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	7	0	0	131	11	934	14	140	612	46
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 58.2%

ICU Level of Service B

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2033 Build
AM Peak Hour

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗	↗	↗	↗	↗
Traffic Vol, veh/h	0	0	6	0	0	118	10	841	13	126	551	41
Future Vol, veh/h	0	0	6	0	0	118	10	841	13	126	551	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	75	-	150	325	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	9	2	2	10	2
Mvmt Flow	0	0	7	0	0	131	11	934	14	140	612	46

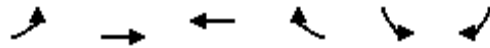
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	612	-	-	934	658	0	0	948	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.7	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.1	-	-	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	519	0	0	337	660	-	-	622	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	519	-	-	337	660	-	-	622	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12		22.3		0.1		2.2	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	660	-	-	519	337	622	-
HCM Lane V/C Ratio	0.017	-	-	0.013	0.389	0.225	-
HCM Control Delay (s)	10.5	-	-	12	22.3	12.5	-
HCM Lane LOS	B	-	-	B	C	B	-
HCM 95th %tile Q(veh)	0.1	-	-	0	1.8	0.9	-

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

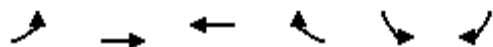
2033 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	346	436	32	50	131
Future Volume (vph)	101	346	436	32	50	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1710	1651	1714	1500	1676	1500
Flt Permitted	0.391				0.950	
Satd. Flow (perm)	704	1651	1714	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				36		146
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2697		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	9%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	384	484	36	56	146
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	22.0	22.0	22.0	22.0	13.0
Total Split (s)	13.0	58.0	45.0	45.0	22.0	13.0
Total Split (%)	16.3%	72.5%	56.3%	56.3%	27.5%	16.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	65.6	67.6	52.7	52.7	9.3	17.3
Actuated g/C Ratio	0.82	0.84	0.66	0.66	0.12	0.22
v/c Ratio	0.17	0.28	0.43	0.04	0.29	0.33
Control Delay	3.1	3.3	10.0	3.2	35.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	3.3	10.0	3.2	35.4	6.0
LOS	A	A	B	A	D	A
Approach Delay		3.2	9.5		14.1	
Approach LOS		A	A		B	
Queue Length 50th (ft)	11	46	123	0	26	0
Queue Length 95th (ft)	26	90	227	12	58	37
Internal Link Dist (ft)		730	2617		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	683	1395	1128	999	356	447

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2033 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.16	0.28	0.43	0.04	0.16	0.33

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 7.7

Intersection LOS: A

Intersection Capacity Utilization 46.0%

ICU Level of Service A

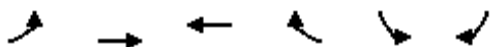
Analysis Period (min) 15

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2033 Build
AM Peak Hour



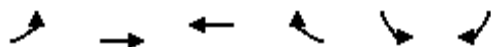
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	346	436	32	50	131
Future Volume (veh/h)	101	346	436	32	50	131
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1800	1674	1730	1772	1772	1772
Adj Flow Rate, veh/h	112	384	484	36	56	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	9	5	2	2	2
Cap, veh/h	597	1249	1081	939	218	281
Arrive On Green	0.06	0.75	0.63	0.63	0.13	0.13
Sat Flow, veh/h	1714	1674	1730	1502	1688	1502
Grp Volume(v), veh/h	112	384	484	36	56	146
Grp Sat Flow(s),veh/h/ln	1714	1674	1730	1502	1688	1502
Q Serve(g_s), s	1.6	6.0	11.6	0.7	2.4	7.0
Cycle Q Clear(g_c), s	1.6	6.0	11.6	0.7	2.4	7.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	597	1249	1081	939	218	281
V/C Ratio(X)	0.19	0.31	0.45	0.04	0.26	0.52
Avail Cap(c_a), veh/h	668	1249	1081	939	359	407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.0	3.3	7.8	5.8	31.4	29.3
Incr Delay (d2), s/veh	0.2	0.6	1.3	0.1	0.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	2.3	6.5	0.4	1.8	4.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.1	4.0	9.1	5.8	32.0	30.7
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		496	520		202	
Approach Delay, s/veh		4.2	8.9		31.1	
Approach LOS		A	A		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.7	55.0			64.7	15.3
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	39.0			52.0	16.0
Max Q Clear Time (g_c+I1), s	3.6	13.6			8.0	9.0
Green Ext Time (p_c), s	0.1	1.9			1.4	0.4

Intersection Summary

HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

Lanes, Volumes, Timings
28: SR 0230 & Western Parcels Access

2033 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	18	613	528	22	38	11
Future Volume (vph)	18	613	528	22	38	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12
Grade (%)		1%	-1%		0%	
Storage Length (ft)	500			150	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1702	1661	1725	1591	1740	0
Flt Permitted	0.950				0.963	
Satd. Flow (perm)	1702	1661	1725	1591	1740	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		1000	940		500	
Travel Time (s)		15.2	14.2		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	10%	7%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	681	587	24	54	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 42.3% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	613	528	22	38	11
Future Vol, veh/h	18	613	528	22	38	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	1	-1	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	10	7	2	2	2
Mvmt Flow	20	681	587	24	42	12
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	611	0	-	0	1308	587
Stage 1	-	-	-	-	587	-
Stage 2	-	-	-	-	721	-
Critical Hdwy	4.5	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	713	-	-	-	167	521
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	539	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	713	-	-	-	162	521
Mov Cap-2 Maneuver	-	-	-	-	335	-
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	539	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		16.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	713	-	-	-	364	
HCM Lane V/C Ratio	0.028	-	-	-	0.15	
HCM Control Delay (s)	10.2	-	-	-	16.6	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2033 Build
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	368	469	39	37	3
Future Volume (vph)	3	368	469	39	37	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1318	1693	1718	0	1568	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1318	1693	1718	0	1568	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2697	1003		1286	
Travel Time (s)		33.4	12.4		25.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	33%	9%	5%	9%	4%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	404	558	0	44	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 37.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	368	469	39	37	3
Future Vol, veh/h	3	368	469	39	37	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	33	9	5	9	4	33
Mvmt Flow	3	404	515	43	41	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	558	0	-	0	947	537
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	410	-
Critical Hdwy	4.4	-	-	-	6.84	6.7
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	3.3	-	-	-	3	3.4
Pot Cap-1 Maneuver	705	-	-	-	287	497
Stage 1	-	-	-	-	623	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	705	-	-	-	286	497
Mov Cap-2 Maneuver	-	-	-	-	435	-
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	728	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		14.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	705	-	-	-	439	
HCM Lane V/C Ratio	0.005	-	-	-	0.1	
HCM Control Delay (s)	10.1	-	-	-	14.1	
HCM Lane LOS	B	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Lanes, Volumes, Timings
31: Ridge Run Rd & Site Driveway

2033 Build
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	10	14	28	30	0
Future Volume (vph)	0	10	14	28	30	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1629	1632	0
Flt Permitted				0.983		
Satd. Flow (perm)	1611	0	0	1629	1632	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	435			1286	904	
Travel Time (s)	11.9			25.1	17.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	12%	7%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	47	33	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
31: Ridge Run Rd & Site Driveway

2033 Build
AM Peak Hour

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	14	28	30	0
Future Vol, veh/h	0	10	14	28	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	12	7	2
Mvmt Flow	0	11	16	31	33	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	96	33	33	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	63	-	-	-	-	-
Critical Hdwy	6.42	6.22	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	1052	1113	1176	-	-	-
Stage 1	1158	-	-	-	-	-
Stage 2	1120	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1037	1113	1176	-	-	-
Mov Cap-2 Maneuver	1037	-	-	-	-	-
Stage 1	1142	-	-	-	-	-
Stage 2	1120	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.3	2.7		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1176	-	1113	-	-	
HCM Lane V/C Ratio	0.013	-	0.01	-	-	
HCM Control Delay (s)	8.1	0	8.3	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2033 Build
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	23	35	6	45	127	48	365	10	34	225	81
Future Volume (vph)	73	23	35	6	45	127	48	365	10	34	225	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1299	0	0	1537	0	0	1666	0	0	1527	0
Flt Permitted		0.973			0.998			0.994			0.995	
Satd. Flow (perm)	0	1299	0	0	1537	0	0	1666	0	0	1527	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	185	0	0	440	0	0	353	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	58.7%											
Analysis Period (min)	15											
ICU Level of Service B												

Intersection	
Intersection Delay, s/veh	19.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	73	23	35	6	45	127	48	365	10	34	225	81
Future Vol, veh/h	73	23	35	6	45	127	48	365	10	34	225	81
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	76	24	36	6	47	132	50	380	10	35	234	84
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.7	12.4	24.4	19.1
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	56%	3%	10%
Vol Thru, %	86%	18%	25%	66%
Vol Right, %	2%	27%	71%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	423	131	178	340
LT Vol	48	73	6	34
Through Vol	365	23	45	225
RT Vol	10	35	127	81
Lane Flow Rate	441	136	185	354
Geometry Grp	1	1	1	1
Degree of Util (X)	0.741	0.287	0.324	0.62
Departure Headway (Hd)	6.056	7.584	6.297	6.299
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	599	474	569	574
Service Time	4.056	5.643	4.353	4.343
HCM Lane V/C Ratio	0.736	0.287	0.325	0.617
HCM Control Delay	24.4	13.7	12.4	19.1
HCM Lane LOS	C	B	B	C
HCM 95th-tile Q	6.4	1.2	1.4	4.2

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	841	90	244	660	129	177
Future Volume (vph)	841	90	244	660	129	177
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1804	0	1744	1958	1571	0
Flt Permitted			0.085		0.979	
Satd. Flow (perm)	1804	0	156	1958	1571	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	10					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1023	0	268	725	337	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	48.0		12.0	60.0	20.0	
Total Split (%)	60.0%		15.0%	75.0%	25.0%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	42.8		56.0	54.8	14.8	
Actuated g/C Ratio	0.54		0.70	0.68	0.18	
v/c Ratio	1.06		1.00	0.54	1.16	
Control Delay	65.7		62.6	6.3	136.9	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	65.7		62.6	6.3	136.9	
LOS	E		E	A	F	
Approach Delay	65.7			21.5	136.9	
Approach LOS	E			C	F	
Queue Length 50th (ft)	~567		79	130	~202	
Queue Length 95th (ft)	#800		m#118	m146	#360	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)			150			
Base Capacity (vph)	969		268	1341	290	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	1.06		1.00	0.54	1.16	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.16

Intersection Signal Delay: 57.2

Intersection LOS: E

Intersection Capacity Utilization 97.8%

ICU Level of Service F

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 Build
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	841	90	244	660	129	177
Future Volume (veh/h)	841	90	244	660	129	177
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	924	90	268	725	142	195
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	833	81	281	1431	129	177
Arrive On Green	0.54	0.52	0.20	1.00	0.19	0.17
Sat Flow, veh/h	1556	152	1914	2090	695	954
Grp Volume(v), veh/h	0	1014	268	725	338	0
Grp Sat Flow(s),veh/h/ln	0	1708	1914	2090	1654	0
Q Serve(g_s), s	0.0	42.8	7.2	0.0	14.8	0.0
Cycle Q Clear(g_c), s	0.0	42.8	7.2	0.0	14.8	0.0
Prop In Lane		0.09	1.00		0.42	0.58
Lane Grp Cap(c), veh/h	0	914	281	1431	306	0
V/C Ratio(X)	0.00	1.11	0.95	0.51	1.10	0.00
Avail Cap(c_a), veh/h	0	914	281	1431	306	0
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	18.6	21.3	0.0	32.9	0.0
Incr Delay (d2), s/veh	0.0	64.6	40.8	1.3	82.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	43.0	12.0	0.9	19.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	83.3	62.2	1.3	115.4	0.0
LnGrp LOS	A	F	E	A	F	A
Approach Vol, veh/h	1014			993	338	
Approach Delay, s/veh	83.3			17.7	115.4	
Approach LOS	F			B	F	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.0	48.0		20.0		60.0
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	41.8		13.8		53.8
Max Q Clear Time (g_c+I1), s	9.2	44.8		16.8		2.0
Green Ext Time (p_c), s	0.0	0.0		0.0		25.6

Intersection Summary

HCM 6th Ctrl Delay	60.1
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	998	0	0	1157	124	1	0	2	58	0	84
Future Volume (vph)	85	998	0	0	1157	124	1	0	2	58	0	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1640	1828	0	1843	1741	0	0	1661	0	1771	1576	0
Flt Permitted	0.950							0.984		0.950		
Satd. Flow (perm)	1640	1828	0	1843	1741	0	0	1661	0	1771	1576	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	8%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	1073	0	0	1377	0	0	3	0	62	90	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 85.5%

ICU Level of Service E

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	26.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	998	0	0	1157	124	1	0	2	58	0	84
Future Vol, veh/h	85	998	0	0	1157	124	1	0	2	58	0	84
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	2	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	91	1073	0	0	1244	133	1	0	2	62	0	90

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1377	0	0	1073	0	0	2612	2632	1073	2567	2566	1312
Stage 1	-	-	-	-	-	-	1255	1255	-	1311	1311	-
Stage 2	-	-	-	-	-	-	1357	1377	-	1256	1255	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	490	-	-	352	-	-	23	32	298	~ 28	41	226
Stage 1	-	-	-	-	-	-	265	282	-	266	287	-
Stage 2	-	-	-	-	-	-	234	250	-	284	302	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	490	-	-	352	-	-	12	26	298	~ 24	33	226
Mov Cap-2 Maneuver	-	-	-	-	-	-	12	26	-	~ 24	33	-
Stage 1	-	-	-	-	-	-	216	230	-	217	287	-
Stage 2	-	-	-	-	-	-	140	250	-	230	246	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	125.6	\$ 454.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	33	490	-	-	352	-	-	24	226
HCM Lane V/C Ratio	0.098	0.187	-	-	-	-	-	2.599	0.4
HCM Control Delay (s)	125.6	14	-	-	0	-	-	\$ 1066.7	31.1
HCM Lane LOS	F	B	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	0.3	0.7	-	-	0	-	-	7.8	1.8

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	818	38	159	979	18	282	3	122	25	9	17
Future Volume (vph)	15	818	38	159	979	18	282	3	122	25	9	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1766	1584	1572	1697	1608	1694	1574	0	1761	1751	0
Flt Permitted	0.135			0.096			0.740			0.674		
Satd. Flow (perm)	235	1766	1550	159	1697	1608	1314	1574	0	1250	1751	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			40		127			18	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)			1				2					2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	852	40	166	1020	19	294	130	0	26	27	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0	43.0	13.0	56.0	56.0	24.0	24.0		24.0	24.0	
Total Split (%)	53.8%	53.8%	53.8%	16.3%	70.0%	70.0%	30.0%	30.0%		30.0%	30.0%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	37.3	37.3	37.3	51.5	50.2	50.2	19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.64	0.63	0.63	0.24	0.24		0.24	0.24	
v/c Ratio	0.15	1.03	0.05	0.66	0.96	0.02	0.94	0.28		0.09	0.06	
Control Delay	13.2	45.6	0.1	29.7	21.2	0.1	70.4	7.0		24.8	14.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	13.2	45.6	0.1	29.7	21.2	0.1	70.4	7.0		24.8	14.2	
LOS	B	D	A	C	C	A	E	A		C	B	
Approach Delay		43.1			22.1			51.0			19.4	
Approach LOS		D			C			D			B	
Queue Length 50th (ft)	3	~396	0	30	28	0	145	1		10	4	
Queue Length 95th (ft)	m4	m291	m0	m60	m#726	m0	#294	42		30	23	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	109	824	784	252	1064	1023	313	472		298	431	
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	0.15	1.03	0.05	0.66	0.96	0.02	0.94	0.28		0.09	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 33 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 34.1

Intersection LOS: C

Intersection Capacity Utilization 103.8%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	818	38	159	979	18	282	3	122	25	9	17
Future Volume (veh/h)	15	818	38	159	979	18	282	3	122	25	9	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	2061	2032	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	16	852	25	166	1020	16	294	3	87	26	9	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	380	983	844	472	1089	968	435	13	389	374	169	281
Arrive On Green	0.97	0.97	0.97	0.17	1.00	1.00	0.24	0.24	0.23	0.24	0.24	0.23
Sat Flow, veh/h	600	2032	1745	1666	1736	1542	1467	56	1628	1409	707	1179
Grp Volume(v), veh/h	16	852	25	166	1020	16	294	0	90	26	0	24
Grp Sat Flow(s),veh/h/ln	600	2032	1745	1666	1736	1542	1467	0	1685	1409	0	1886
Q Serve(g_s), s	0.1	6.7	0.0	3.6	0.0	0.0	15.3	0.0	3.5	1.2	0.0	0.8
Cycle Q Clear(g_c), s	0.1	6.7	0.0	3.6	0.0	0.0	15.6	0.0	3.5	4.2	0.0	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.63
Lane Grp Cap(c), veh/h	380	983	844	472	1089	968	435	0	402	374	0	450
V/C Ratio(X)	0.04	0.87	0.03	0.35	0.94	0.02	0.68	0.00	0.22	0.07	0.00	0.05
Avail Cap(c_a), veh/h	380	983	844	504	1089	968	435	0	402	374	0	450
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)	1.00	1.00	1.00	0.45	0.45	0.45	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.7	0.8	0.7	7.0	0.0	0.0	29.3	0.0	24.9	26.0	0.0	23.7
Incr Delay (d2), s/veh	0.2	10.2	0.1	0.2	8.5	0.0	4.1	0.0	0.3	0.1	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(95%),veh/ln	0.1	5.8	0.1	1.7	4.3	0.0	9.7	0.0	2.5	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.9	10.9	0.7	7.2	8.5	0.0	33.4	0.0	25.2	26.1	0.0	23.8
LnGrp LOS	A	B	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	893			1202				384			50	
Approach Delay, s/veh	10.5			8.2				31.5			25.0	
Approach LOS	B			A				C			C	
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	11.5	44.5	24.0			56.0		24.0				
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8		* 5.9				
Max Green Setting (Gmax), s	7.5	36.2	* 18			49.2		* 18				
Max Q Clear Time (g_c+I1), s	6.1	9.2	6.7			2.5		18.1				
Green Ext Time (p_c), s	0.1	1.1	0.1			1.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 12.8
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	637	1	11	985	77	10	2	1	44	3	117
Future Volume (vph)	89	637	1	11	985	77	10	2	1	44	3	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%				-1%
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1729	0	1586	1818	1561	0	1829	0	1719	1506	0
Flt Permitted	0.099			0.409				0.677		0.748		
Satd. Flow (perm)	175	1729	0	683	1818	1561	0	1282	0	1353	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		1			123	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	10%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	672	0	12	1037	81	0	14	0	46	126	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	11.0	62.0		51.0	51.0	51.0	18.0	18.0		18.0	18.0	
Total Split (%)	13.8%	77.5%		63.8%	63.8%	63.8%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	63.8	64.0		55.2	55.2	55.2		9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69		0.12		0.12	0.12	
v/c Ratio	0.36	0.49		0.03	0.83	0.07		0.09		0.29	0.44	
Control Delay	5.9	8.6		4.0	15.8	0.2		30.1		36.3	12.1	
Queue Delay	0.0	0.0		0.0	0.5	0.0		0.0		0.0	0.0	
Total Delay	5.9	8.6		4.0	16.4	0.2		30.1		36.3	12.1	
LOS	A	A		A	B	A		C		D	B	
Approach Delay		8.3			15.1			30.1			18.6	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	9	228		1	466	0		6		21	1	
Queue Length 95th (ft)	m14	m321		m2	m#742	m1		22		51	47	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	261	1383		471	1254	1111		215		226	354	
Starvation Cap Reductn	0	0		0	42	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	0.36	0.49		0.03	0.86	0.07		0.07		0.20	0.36	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 11 (14%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 13.0

Intersection LOS: B

Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2033 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	637	1	11	985	77	10	2	1	44	3	117
Future Volume (veh/h)	89	637	1	11	985	77	10	2	1	44	3	117
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	0.99		1.00	0.99		0.99
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	1711	1683	1711	1807	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	94	671	1	12	1037	72	11	2	0	46	3	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	10	1	0	0	0	0	0	0	0
Cap, veh/h	494	1335	2	597	1327	1133	116	16	0	215	5	119
Arrive On Green	0.07	1.00	1.00	1.00	1.00	1.00	0.07	0.08	0.00	0.08	0.08	0.07
Sat Flow, veh/h	1629	1680	3	740	1935	1652	414	200	0	1377	66	1479
Grp Volume(v), veh/h	94	0	672	12	1037	72	13	0	0	46	0	70
Grp Sat Flow(s),veh/h/ln	1629	0	1682	740	1935	1652	614	0	0	1377	0	1545
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	3.5
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	2.0	0.0	3.5
Prop In Lane	1.00		0.00	1.00		1.00	0.85		0.00	1.00		0.96
Lane Grp Cap(c), veh/h	494	0	1337	597	1327	1133	125	0	0	215	0	124
V/C Ratio(X)	0.19	0.00	0.50	0.02	0.78	0.06	0.10	0.00	0.00	0.21	0.00	0.56
Avail Cap(c_a), veh/h	541	0	1337	597	1327	1133	245	0	0	335	0	259
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)	0.09	0.00	0.09	0.45	0.45	0.45	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.3	0.0	0.0	0.0	0.0	0.0	35.4	0.0	0.0	34.7	0.0	35.9
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.0	2.1	0.0	0.4	0.0	0.0	0.5	0.0	4.0
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(95%),veh/ln	0.3	0.0	0.1	0.0	1.4	0.0	0.5	0.0	0.0	1.6	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.3	0.0	0.1	0.0	2.1	0.0	35.8	0.0	0.0	35.2	0.0	39.9
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	766		1121				13		116			
Approach Delay, s/veh	0.4		2.0				35.8		38.0			
Approach LOS	A		A				D		D			
Timer - Assigned Phs	1	2	4			6		8				
Phs Duration (G+Y+Rc), s	8.7	60.3	11.0			69.0		11.0				
Change Period (Y+Rc), s	5.5	6.4	5.6			6.4		5.6				
Max Green Setting (Gmax), s	5.5	44.6	12.4			55.6		12.4				
Max Q Clear Time (g_c+I1), s	3.6	2.5	5.5			2.5		5.8				
Green Ext Time (p_c), s	0.0	1.6	0.2			0.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	3.7											
HCM 6th LOS	A											

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	578	24	43	862	64	100	48	31	54	53	100
Future Volume (vph)	68	578	24	43	862	64	100	48	31	54	53	100
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1712	0	1573	1673	0	1572	1620	0	0	1818	0
Flt Permitted	0.171			0.358			0.484				0.885	
Satd. Flow (perm)	297	1712	0	592	1673	0	800	1620	0	0	1630	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			7			33			63	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	3%	0%	3%	1%	0%	0%	3%	3%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	633	0	45	974	0	105	84	0	0	218	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	48.0	48.0		48.0	48.0		32.0	32.0		32.0	32.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	55.0	55.0		55.0	55.0		15.1	15.1			15.1	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.19	0.19			0.19	
v/c Ratio	0.35	0.54		0.11	0.84		0.70	0.25			0.61	
Control Delay	6.3	3.1		6.6	20.4		52.7	18.5			27.3	
Queue Delay	0.0	0.0		0.0	2.8		0.0	0.0			0.0	
Total Delay	6.3	3.1		6.6	23.2		52.7	18.5			27.3	
LOS	A	A		A	C		D	B			C	
Approach Delay		3.4			22.4			37.5			27.3	
Approach LOS		A			C			D			C	
Queue Length 50th (ft)	1	10		6	306		50	22			70	
Queue Length 95th (ft)	m15	81		24	#726		93	53			124	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		530			920			270			920	
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	204	1179		407	1153		270	568			591	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	97		0	0			3	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.35	0.54		0.11	0.92		0.39	0.15			0.37	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 18.0

Intersection LOS: B

Intersection Capacity Utilization 87.2%

ICU Level of Service E

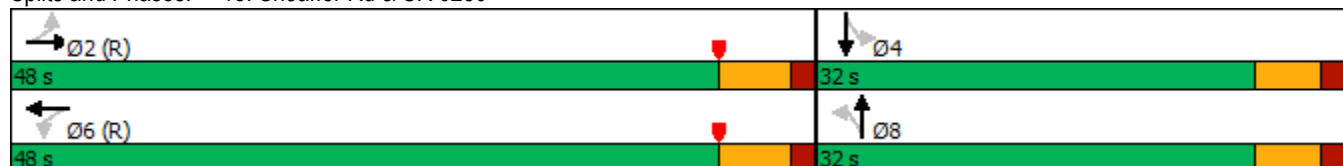
Analysis Period (min) 15

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.

Splits and Phases: 13: Sheaffer Rd & SR 0230



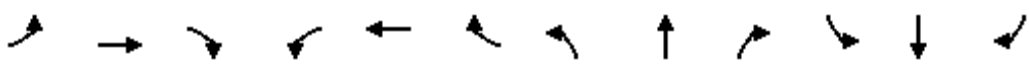
HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2033 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	578	24	43	862	64	100	48	31	54	53	100
Future Volume (veh/h)	68	578	24	43	862	64	100	48	31	54	53	100
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	1722	1708	1750	1869	1898	1912	1750	1708	1708	1949	1997	1921
Adj Flow Rate, veh/h	72	608	24	45	907	65	105	51	15	57	56	84
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	3	0	3	1	0	0	3	3	0	2	2
Cap, veh/h	308	1167	46	658	1252	90	242	204	60	117	92	113
Arrive On Green	1.00	1.00	1.00	0.72	0.72	0.70	0.16	0.16	0.15	0.15	0.16	0.15
Sat Flow, veh/h	532	1632	64	794	1750	125	1166	1267	373	368	574	701
Grp Volume(v), veh/h	72	0	632	45	0	972	105	0	66	197	0	0
Grp Sat Flow(s),veh/h/ln	532	0	1696	794	0	1875	1166	0	1639	1643	0	0
Q Serve(g_s), s	5.7	0.0	0.0	1.4	0.0	24.5	0.0	0.0	2.8	6.5	0.0	0.0
Cycle Q Clear(g_c), s	30.3	0.0	0.0	1.4	0.0	24.5	9.3	0.0	2.8	9.3	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.07	1.00		0.23	0.29		0.43
Lane Grp Cap(c), veh/h	308	0	1214	658	0	1341	242	0	263	302	0	0
V/C Ratio(X)	0.23	0.00	0.52	0.07	0.00	0.72	0.43	0.00	0.25	0.65	0.00	0.00
Avail Cap(c_a), veh/h	308	0	1214	658	0	1341	448	0	553	597	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)	0.88	0.00	0.88	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.5	0.0	0.0	3.4	0.0	6.7	32.1	0.0	29.5	32.4	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	1.4	0.2	0.0	3.4	1.2	0.0	0.5	2.4	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(95%),veh/ln	1.0	0.0	0.9	0.3	0.0	11.8	3.5	0.0	2.0	6.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.1	0.0	1.4	3.6	0.0	10.2	33.3	0.0	30.0	34.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	B	C	A	C	C	A	A
Approach Vol, veh/h	704		1017				171		197			
Approach Delay, s/veh	2.1		9.9				32.0		34.8			
Approach LOS	A		A				C		C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	62.1		17.9		62.1		17.9					
Change Period (Y+Rc), s	* 5.9		6.0		* 5.9		6.0					
Max Green Setting (Gmax), s	* 42		26.0		* 42		26.0					
Max Q Clear Time (g_c+I1), s	2.0		11.3		26.5		11.3					
Green Ext Time (p_c), s	20.6		0.5		14.1		0.5					
Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									
Notes												

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↷	↷
Traffic Volume (vph)	0	0	0	806	0	128	442	217	0	0	304	49
Future Volume (vph)	0	0	0	806	0	128	442	217	0	0	304	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1653	1414	1589	1511	0	0	1658	1637
Flt Permitted					0.950		0.294					
Satd. Flow (perm)	0	0	0	0	1653	1414	492	1511	0	0	1658	1637
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						151						143
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	0%	2%	3%	14%	2%	2%	6%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	848	135	465	228	0	0	320	52
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				30.0	30.0	30.0	13.0	35.0			22.0	22.0
Total Split (%)				46.2%	46.2%	46.2%	20.0%	53.8%			33.8%	33.8%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					25.5	25.5	29.6	29.6			16.6	16.6
Actuated g/C Ratio					0.39	0.39	0.46	0.46			0.26	0.26
v/c Ratio					1.30	0.21	1.29	0.33			0.75	0.10
Control Delay					169.4	3.1	168.6	12.8			35.4	0.4
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					169.4	3.1	168.6	12.8			35.4	0.4
LOS					F	A	F	B			D	A
Approach Delay					146.6			117.4			30.5	
Approach LOS					F			F			C	
Queue Length 50th (ft)					~444	0	~187	54			116	0
Queue Length 95th (ft)					#644	25	#403	100			#227	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings

2033 Build

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					652	649	361	701			435	535
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					1.30	0.21	1.29	0.33			0.74	0.10

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 64.6

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 115.6

Intersection LOS: F

Intersection Capacity Utilization 178.3%

ICU Level of Service H

Analysis Period (min) 15

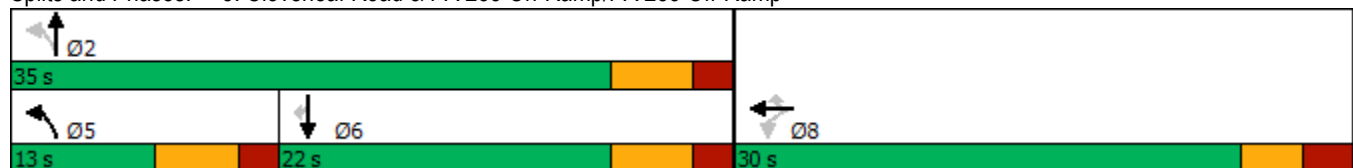
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	806	0	128	442	217	0	0	304	49
Future Volume (veh/h)	0	0	0	806	0	128	442	217	0	0	304	49
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1860	1875	1846	1736	1581	0	0	1789	1846
Adj Flow Rate, veh/h				848	0	0	465	228	0	0	320	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				1	0	2	3	14	0	0	6	7
Cap, veh/h				722	0		395	703	0	0	426	
Arrive On Green				0.39	0.00	0.00	0.13	0.44	0.00	0.00	0.24	0.00
Sat Flow, veh/h				1785	0	1564	1653	1581	0	0	1789	1564
Grp Volume(v), veh/h				848	0	0	465	228	0	0	320	0
Grp Sat Flow(s),veh/h/ln				1785	0	1564	1653	1581	0	0	1789	1564
Q Serve(g_s), s				25.5	0.0	0.0	8.0	5.9	0.0	0.0	10.5	0.0
Cycle Q Clear(g_c), s				25.5	0.0	0.0	8.0	5.9	0.0	0.0	10.5	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				722	0		395	703	0	0	426	
V/C Ratio(X)				1.17	0.00		1.18	0.32	0.00	0.00	0.75	
Avail Cap(c_a), veh/h				722	0		395	753	0	0	483	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.3	0.0	0.0	19.9	11.4	0.0	0.0	22.3	0.0
Incr Delay (d2), s/veh				92.5	0.0	0.0	102.8	1.0	0.0	0.0	10.0	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
%ile BackOfQ(95%),veh/ln				41.0	0.0	0.0	20.5	3.4	0.0	0.0	8.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				111.7	0.0	0.0	122.8	12.3	0.0	0.0	32.3	0.0
LnGrp LOS				F	A		F	B	A	A	C	
Approach Vol, veh/h				848			693				320	
Approach Delay, s/veh				111.7			86.4				32.3	
Approach LOS				F			F				C	
Timer - Assigned Phs	2			5		6	8					
Phs Duration (G+Y+Rc), s	33.0			13.0		20.0	30.0					
Change Period (Y+Rc), s	6.0			6.0		6.0	5.5					
Max Green Setting (Gmax), s	29.0			7.0		16.0	24.5					
Max Q Clear Time (g_c+I1), s	7.9			10.0		12.5	27.5					
Green Ext Time (p_c), s	4.5			0.0		1.6	0.0					
Intersection Summary												
HCM 6th Ctrl Delay	88.6											
HCM 6th LOS	F											

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	3	674	0	0	0	0	619	670	103	1015	0
Future Volume (vph)	45	3	674	0	0	0	0	619	670	103	1015	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1563	1569	0	0	0	0	1668	0	1663	1801	0
Flt Permitted		0.955								0.950		
Satd. Flow (perm)	0	1563	1569	0	0	0	0	1668	0	1663	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	19%	0%	1%	2%	2%	2%	2%	5%	2%	6%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	49	695	0	0	0	0	1329	0	106	1046	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 178.3%

ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2033 Build
PM Peak Hour

Intersection												
Int Delay, s/veh	127.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	45	3	674	0	0	0	0	619	670	103	1015	0
Future Vol, veh/h	45	3	674	0	0	0	0	619	670	103	1015	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	19	0	1	2	2	2	2	5	2	6	3	2
Mvmt Flow	46	3	695	0	0	0	0	638	691	106	1046	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1896	1896	1046	-	0	0	638	0	0
Stage 1	1258	1258	-	-	-	-	-	-	-
Stage 2	638	638	-	-	-	-	-	-	-
Critical Hdwy	6.7	5.9	5.91	-	-	-	4	-	-
Critical Hdwy Stg 1	4.99	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.99	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.2	4	3.1	-	-	-	3.1	-	-
Pot Cap-1 Maneuver	68	97	~ 316	0	-	-	743	-	0
Stage 1	327	302	-	0	-	-	-	-	0
Stage 2	609	527	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	58	0	~ 316	-	-	-	743	-	-
Mov Cap-2 Maneuver	58	0	-	-	-	-	-	-	-
Stage 1	327	0	-	-	-	-	-	-	-
Stage 2	522	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	550.5	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	58	316	743	-
HCM Lane V/C Ratio	-	-	0.853	2.199	0.143	-
HCM Control Delay (s)	-	-	191.9	\$ 576	10.7	-
HCM Lane LOS	-	-	F	F	B	-
HCM 95th %tile Q(veh)	-	-	3.8	52.3	0.5	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	10	9	1272	1662	11
Future Volume (vph)	3	10	9	1272	1662	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1628	0	0	1801	1781	0
Flt Permitted	0.989					
Satd. Flow (perm)	1628	0	0	1801	1781	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	1320	1724	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	98.1%			ICU Level of Service F		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	10	9	1272	1662	11
Future Vol, veh/h	3	10	9	1272	1662	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	3	10	9	1311	1713	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	3048	1719	1724	0	-	0
Stage 1	1719	-	-	-	-	-
Stage 2	1329	-	-	-	-	-
Critical Hdwy	6.4	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	15	115	349	-	-	-
Stage 1	171	-	-	-	-	-
Stage 2	270	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	14	115	349	-	-	-
Mov Cap-2 Maneuver	14	-	-	-	-	-
Stage 1	155	-	-	-	-	-
Stage 2	270	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	122.9	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	349	-	43	-	-
HCM Lane V/C Ratio	0.027	-	0.312	-	-
HCM Control Delay (s)	15.6	0	122.9	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	329	35	145	10	43	37	133	921	14	51	1169	455
Future Volume (vph)	329	35	145	10	43	37	133	921	14	51	1169	455
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1649	0	1416	1704	0	1620	1696	0	1628	1672	0
Flt Permitted	0.702			0.603			0.107			0.129		
Satd. Flow (perm)	1197	1649	0	899	1704	0	182	1696	0	221	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		79			39			2			62	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	346	190	0	11	84	0	140	984	0	54	1710	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	
v/c Ratio	1.45	0.48		0.06	0.23		1.24	0.93		0.39	1.60	
Control Delay	248.7	17.5		20.6	14.4		134.9	14.8		15.9	293.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	248.7	17.5		20.6	14.4		134.9	14.8		15.9	293.1	
LOS	F	B		C	B		F	B		B	F	
Approach Delay		166.7			15.1			29.8			284.6	
Approach LOS		F			B			C			F	
Queue Length 50th (ft)	~176	35		3	14		~108	365		8	~923	
Queue Length 95th (ft)	#316	87		15	45		m39	m157		38	#1167	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	239	393		179	372		113	1060		138	1068	
Starvation Cap Reductn	0	0		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	1.45	0.48		0.06	0.23		1.24	0.93		0.39	1.60	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.60

Intersection Signal Delay: 178.0

Intersection LOS: F

Intersection Capacity Utilization 143.4%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2033 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	35	145	10	43	37	133	921	14	51	1169	455
Future Volume (veh/h)	329	35	145	10	43	37	133	921	14	51	1169	455
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	346	37	129	11	45	25	140	969	14	54	1231	468
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	352	81	282	243	220	122	120	1140	16	207	829	315
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.42	0.42	0.41	0.63	0.63	0.61
Sat Flow, veh/h	1403	404	1408	1040	1099	611	295	1824	26	597	1326	504
Grp Volume(v), veh/h	346	0	166	11	0	70	140	0	983	54	0	1699
Grp Sat Flow(s),veh/h/ln	1403	0	1812	1040	0	1710	295	0	1850	597	0	1830
Q Serve(g_s), s	9.9	0.0	4.9	0.6	0.0	2.1	0.0	0.0	28.8	5.1	0.0	37.5
Cycle Q Clear(g_c), s	12.0	0.0	4.9	5.5	0.0	2.1	37.5	0.0	28.8	33.9	0.0	37.5
Prop In Lane	1.00		0.78	1.00		0.36	1.00		0.01	1.00		0.28
Lane Grp Cap(c), veh/h	352	0	362	243	0	342	120	0	1156	207	0	1144
V/C Ratio(X)	0.98	0.00	0.46	0.05	0.00	0.20	1.17	0.00	0.85	0.26	0.00	1.49
Avail Cap(c_a), veh/h	352	0	362	243	0	342	120	0	1156	207	0	1144
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.00	0.09	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	21.5	23.6	0.0	20.2	36.2	0.0	14.9	24.1	0.0	11.4
Incr Delay (d2), s/veh	42.9	0.0	0.9	0.1	0.0	0.3	83.5	0.0	0.8	3.0	0.0	223.2
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(95%),veh/ln	13.8	0.0	3.6	0.2	0.0	1.4	6.3	0.0	13.3	1.5	0.0	123.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	0.0	22.4	23.6	0.0	20.5	119.7	0.0	15.7	27.1	0.0	234.6
LnGrp LOS	E	A	C	C	A	C	F	A	B	C	A	F
Approach Vol, veh/h	512			81			1123			1753		
Approach Delay, s/veh	54.3			20.9			28.7			228.2		
Approach LOS	D			C			C			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			17.0			43.0			17.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			11.0			36.5			11.0		
Max Q Clear Time (g_c+I1), s	30.8			14.0			39.5			7.5		
Green Ext Time (p_c), s	5.4			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	133.1											
HCM 6th LOS	F											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	64	0	210	17	900	5	130	1158	35
Future Volume (vph)	15	0	18	64	0	210	17	900	5	130	1158	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1611	0	0	1639	0	0	1718	1648
Flt Permitted		0.417			0.915			0.530			0.825	
Satd. Flow (perm)	0	726	1581	0	1490	0	0	870	0	0	1424	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		169			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	288	0	0	970	0	0	1356	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		9.6	9.6		9.6			40.9			40.9	40.9
Actuated g/C Ratio		0.16	0.16		0.16			0.68			0.68	0.68
v/c Ratio		0.14	0.06		0.76			1.64			1.40	0.03
Control Delay		24.1	1.6		25.2			310.8			194.6	0.1
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		24.1	1.6		25.2			310.8			194.6	0.1
LOS		C	A		C			F			F	A
Approach Delay		11.9			25.2			310.8			189.4	
Approach LOS		B			C			F			F	
Queue Length 50th (ft)		5	0		39			~1079			~732	0
Queue Length 95th (ft)		20	4		#141			m#1022			m43	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		127	322		400			593			970	1137
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		0.13	0.06		0.72			1.64			1.40	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.64

Intersection Signal Delay: 213.4

Intersection LOS: F

Intersection Capacity Utilization 159.4%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	64	0	210	17	900	5	130	1158	35
Future Volume (veh/h)	15	0	18	64	0	210	17	900	5	130	1158	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	67	0	206	18	947	5	137	1219	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	267	0	278	128	13	206	61	698	4	126	720	1101
Arrive On Green	0.16	0.00	0.17	0.16	0.00	0.16	0.86	0.89	0.86	1.00	1.00	1.00
Sat Flow, veh/h	842	0	1586	307	76	1177	0	1047	5	90	1080	1652
Grp Volume(v), veh/h	16	0	11	273	0	0	970	0	0	1356	0	36
Grp Sat Flow(s),veh/h/ln	842	0	1586	1560	0	0	1052	0	0	1170	0	1652
Q Serve(g_s), s	0.0	0.0	0.3	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.3	9.5	0.0	0.0	39.0	0.0	0.0	39.0	0.0	0.0
Prop In Lane	1.00		1.00	0.25		0.75	0.02		0.01	0.10		1.00
Lane Grp Cap(c), veh/h	253	0	278	322	0	0	745	0	0	827	0	1101
V/C Ratio(X)	0.06	0.00	0.04	0.85	0.00	0.00	1.30	0.00	0.00	1.64	0.00	0.03
Avail Cap(c_a), veh/h	253	0	278	322	0	0	745	0	0	827	0	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	21.2	0.0	20.6	25.2	0.0	0.0	13.3	0.0	0.0	4.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	18.7	0.0	0.0	145.6	0.0	0.0	288.8	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(95%),veh/ln	0.4	0.0	0.2	9.4	0.0	0.0	53.5	0.0	0.0	99.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	20.6	44.0	0.0	0.0	158.9	0.0	0.0	292.8	0.0	0.0
LnGrp LOS	C	A	C	D	A	A	F	A	A	F	A	A
Approach Vol, veh/h	27			273			970			1392		
Approach Delay, s/veh	21.1			44.0			158.9			285.2		
Approach LOS	C			D			F			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			15.0			45.0			15.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	41.0			3.0			41.0			11.5		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	211.8											
HCM 6th LOS	F											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	333	442	82	176	567	159	123	341	96	245	345	242
Future Volume (vph)	333	442	82	176	567	159	123	341	96	245	345	242
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	1791	1435	1512	1697	1577	1522	1769	0	1604	1640	1442
Flt Permitted	0.089			0.500			0.317			0.129		
Satd. Flow (perm)	149	1791	1435	796	1697	1577	508	1769	0	218	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		11				249
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1028				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	343	456	85	181	585	164	127	451	0	253	356	249
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	23.0	68.0	68.0	45.0	45.0	45.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	19.2%	56.7%	56.7%	37.5%	37.5%	37.5%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	62.5	62.5	62.5	39.5	39.5	39.5	35.0	26.0		45.0	31.0	31.0
Actuated g/C Ratio	0.52	0.52	0.52	0.33	0.33	0.33	0.29	0.22		0.38	0.26	0.26
v/c Ratio	1.20	0.49	0.11	0.69	1.05	0.26	0.57	1.15		1.04	0.84	0.45
Control Delay	148.8	20.7	2.3	52.2	91.9	10.8	37.1	135.7		66.1	39.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	148.8	20.7	2.3	52.2	91.9	10.8	37.1	135.7		66.1	39.1	6.0
LOS	F	C	A	D	F	B	D	F		E	D	A
Approach Delay		68.7			69.8			114.1			37.5	
Approach LOS		E			E			F			D	
Queue Length 50th (ft)	~276	219	0	133	~504	22	66	~406		~163	242	27
Queue Length 95th (ft)	#466	309	19	m#223	#730	m65	113	#614		m115	m174	m8
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	287	932	795	262	558	625	224	391		243	423	557
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.20	0.49	0.11	0.69	1.05	0.26	0.57	1.15		1.04	0.84	0.45

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 68.8

Intersection LOS: E

Intersection Capacity Utilization 109.6%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

			
Ø1	Ø2	Ø3	Ø4 (R)
23 s	45 s	20 s	32 s
			
Ø6	Ø7	Ø8 (R)	
68 s	15 s	37 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	333	442	82	176	567	159	123	341	96	245	345	242
Future Volume (veh/h)	333	442	82	176	567	159	123	341	96	245	345	242
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	343	456	55	181	585	0	127	352	98	253	356	178
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	313	950	811	330	581		251	352	98	252	427	362
Arrive On Green	0.15	0.52	0.52	0.66	0.66	0.00	0.08	0.22	0.21	0.12	0.26	0.26
Sat Flow, veh/h	1736	1823	1557	820	1766	1544	1880	1623	452	1616	1655	1402
Grp Volume(v), veh/h	343	456	55	181	585	0	127	0	450	253	356	178
Grp Sat Flow(s),veh/h/ln	1736	1823	1557	820	1766	1544	1880	0	2075	1616	1655	1402
Q Serve(g_s), s	17.5	19.2	2.1	16.2	39.5	0.0	6.2	0.0	26.0	14.0	24.4	12.9
Cycle Q Clear(g_c), s	17.5	19.2	2.1	16.2	39.5	0.0	6.2	0.0	26.0	14.0	24.4	12.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	313	950	811	330	581		251	0	450	252	427	362
V/C Ratio(X)	1.10	0.48	0.07	0.55	1.01		0.51	0.00	1.00	1.00	0.83	0.49
Avail Cap(c_a), veh/h	313	950	811	330	581		251	0	450	252	427	362
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)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	18.4	14.3	16.5	20.5	0.0	34.1	0.0	47.1	34.2	42.1	37.8
Incr Delay (d2), s/veh	78.8	0.1	0.0	1.1	38.9	0.0	1.6	0.0	42.7	57.6	17.1	4.7
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(95%),veh/ln	18.3	12.1	1.3	3.7	19.6	0.0	5.3	0.0	25.9	14.6	17.3	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	116.8	18.5	14.3	17.6	59.4	0.0	35.7	0.0	89.8	91.8	59.2	42.5
LnGrp LOS	F	B	B	B	F		D	A	F	F	E	D
Approach Vol, veh/h	854			766			577			787		
Approach Delay, s/veh	57.7			49.5			77.9			65.9		
Approach LOS	E			D			E			E		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	23.0	45.0	20.0	32.0		68.0	15.0	37.0				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	16.5	38.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	20.0	42.0	16.5	28.0		21.7	8.7	26.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0		0.2	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 61.7
HCM 6th LOS E

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	46	0	0	270	34	688	74	276	826	87
Future Volume (vph)	0	0	46	0	0	270	34	688	74	276	826	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Storage Length (ft)	0		0	0		0	75		150	325		175
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1611	0	0	1611	1752	1844	1567	1787	1881	1599
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	0	1611	0	0	1611	1752	1844	1567	1787	1881	1599
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	50	0	0	293	37	748	80	300	898	95
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 59.6%

ICU Level of Service B

Analysis Period (min) 15

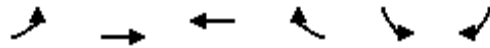
HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2033 Build
PM Peak Hour

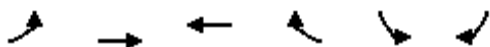
Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗	↗	↗	↗	↗
Traffic Vol, veh/h	0	0	46	0	0	270	34	688	74	276	826	87
Future Vol, veh/h	0	0	46	0	0	270	34	688	74	276	826	87
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	75	-	150	325	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	50	0	0	293	37	748	80	300	898	95
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	898	-	-	748	993	0	0	828	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.7	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.1	-	-	3.1	3	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	353	0	0	433	483	-	-	677	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	353	-	-	433	483	-	-	677	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	16.9		29.1		0.6		3.4					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	483	-	-	353	433	677	-	-				
HCM Lane V/C Ratio	0.077	-	-	0.142	0.678	0.443	-	-				
HCM Control Delay (s)	13.1	-	-	16.9	29.1	14.5	-	-				
HCM Lane LOS	B	-	-	C	D	B	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.5	4.9	2.3	-	-				

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2033 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	239	539	527	111	164	403
Future Volume (vph)	239	539	527	111	164	403
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1748	1500	1676	1500
Flt Permitted	0.313				0.950	
Satd. Flow (perm)	552	1782	1748	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				123		261
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	3%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	266	599	586	123	182	448
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	13.0	82.0	69.0	69.0	38.0	13.0
Total Split (%)	10.8%	68.3%	57.5%	57.5%	31.7%	10.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	90.5	90.5	72.5	72.5	19.5	37.5
Actuated g/C Ratio	0.75	0.75	0.60	0.60	0.16	0.31
v/c Ratio	0.50	0.45	0.55	0.13	0.67	0.69
Control Delay	8.5	8.9	18.2	2.7	58.7	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	8.9	18.2	2.7	58.7	19.4
LOS	A	A	B	A	E	B
Approach Delay		8.8	15.5		30.8	
Approach LOS		A	B		C	
Queue Length 50th (ft)	82	223	255	0	134	126
Queue Length 95th (ft)	m113	m279	429	29	200	223
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	537	1343	1056	955	460	647



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.50	0.45	0.55	0.13	0.40	0.69

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 17.2

Intersection LOS: B

Intersection Capacity Utilization 65.3%

ICU Level of Service C

Analysis Period (min) 15

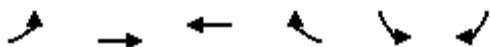
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

2033 Build
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	239	539	527	111	164	403
Future Volume (veh/h)	239	539	527	111	164	403
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	1772	1786	1758	1772	1772	1772
Adj Flow Rate, veh/h	266	599	586	123	182	448
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	3	2	2	2
Cap, veh/h	383	1146	938	801	464	513
Arrive On Green	0.13	1.00	0.53	0.53	0.28	0.28
Sat Flow, veh/h	1688	1786	1758	1502	1688	1502
Grp Volume(v), veh/h	266	599	586	123	182	448
Grp Sat Flow(s),veh/h/ln	1688	1786	1758	1502	1688	1502
Q Serve(g_s), s	8.0	0.0	28.0	5.0	10.5	33.0
Cycle Q Clear(g_c), s	8.0	0.0	28.0	5.0	10.5	33.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	383	1146	938	801	464	513
V/C Ratio(X)	0.69	0.52	0.63	0.15	0.39	0.87
Avail Cap(c_a), veh/h	383	1146	938	801	464	513
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	19.6	14.2	35.3	37.1
Incr Delay (d2), s/veh	5.4	1.7	3.1	0.4	0.5	15.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.9	1.0	16.9	3.1	7.9	20.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.9	1.7	22.7	14.6	35.9	52.3
LnGrp LOS	C	A	C	B	D	D
Approach Vol, veh/h		865	709		630	
Approach Delay, s/veh		8.5	21.3		47.6	
Approach LOS		A	C		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.0	69.0			82.0	38.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	7.0	63.0			76.0	32.0
Max Q Clear Time (g_c+I1), s	10.0	30.0			2.0	35.0
Green Ext Time (p_c), s	0.0	2.9			2.5	0.0
Intersection Summary						
HCM 6th Ctrl Delay			23.8			
HCM 6th LOS			C			

Lanes, Volumes, Timings
28: SR 0230 & Western Parcels Access

2033 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	730	881	51	129	49
Future Volume (vph)	43	730	881	51	129	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12
Grade (%)		1%	-1%		0%	
Storage Length (ft)	500			150	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1702	1809	1758	1591	1731	0
Flt Permitted	0.950				0.965	
Satd. Flow (perm)	1702	1809	1758	1591	1731	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		1000	940		500	
Travel Time (s)		15.2	14.2		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	811	979	57	197	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

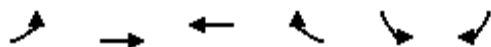
Intersection Capacity Utilization 63.2% ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	17					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	730	881	51	129	49
Future Vol, veh/h	43	730	881	51	129	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	1	-1	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	1	5	2	2	2
Mvmt Flow	48	811	979	57	143	54
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1036	0	-	0	1886	979
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	907	-
Critical Hdwy	4.5	-	-	-	6.8	10
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	491	-	-	-	~ 68	113
Stage 1	-	-	-	-	402	-
Stage 2	-	-	-	-	436	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	491	-	-	-	~ 61	113
Mov Cap-2 Maneuver	-	-	-	-	208	-
Stage 1	-	-	-	-	363	-
Stage 2	-	-	-	-	436	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.7	0		177.2		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	491	-	-	-	169	
HCM Lane V/C Ratio	0.097	-	-	-	1.17	
HCM Control Delay (s)	13.1	-	-	-	177.2	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	0.3	-	-	-	10.6	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Lanes, Volumes, Timings
29: SR 0230 & Ridge Run Rd

2033 Build
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	656	591	92	76	1
Future Volume (vph)	6	656	591	92	76	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1759	0	1670	0
Flt Permitted	0.950				0.953	
Satd. Flow (perm)	1754	1828	1759	0	1670	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1319	
Travel Time (s)		33.5	12.4		25.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	683	712	0	80	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 47.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	656	591	92	76	1
Future Vol, veh/h	6	656	591	92	76	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	2	2	0	0
Mvmt Flow	6	683	616	96	79	1
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	712	0	-	0	1359	664
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	695	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	707	-	-	-	154	468
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	516	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	707	-	-	-	153	468
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	532	-
Stage 2	-	-	-	-	516	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		20.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	707	-	-	-	310	
HCM Lane V/C Ratio	0.009	-	-	-	0.259	
HCM Control Delay (s)	10.1	-	-	-	20.6	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	1	

Lanes, Volumes, Timings
31: Ridge Run Rd & Site Driveway

2033 Build
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	36	33	65	41	0
Future Volume (vph)	0	36	33	65	41	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1735	1747	0
Flt Permitted				0.983		
Satd. Flow (perm)	1611	0	0	1735	1747	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	435			1319	1011	
Travel Time (s)	11.9			25.7	19.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	0	0	109	46	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	36	33	65	41	0
Future Vol, veh/h	0	36	33	65	41	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	0	2
Mvmt Flow	0	40	37	72	46	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	192	46	46	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	146	-	-	-	-	-
Critical Hdwy	6.42	6.2	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	922	1094	1167	-	-	-
Stage 1	1141	-	-	-	-	-
Stage 2	1023	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	892	1094	1167	-	-	-
Mov Cap-2 Maneuver	892	-	-	-	-	-
Stage 1	1103	-	-	-	-	-
Stage 2	1023	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	2.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1167	-	1094	-	-	
HCM Lane V/C Ratio	0.031	-	0.037	-	-	
HCM Control Delay (s)	8.2	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2033 Build
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	85	80	4	53	82	34	382	6	114	435	66
Future Volume (vph)	96	85	80	4	53	82	34	382	6	114	435	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1383	0	0	1559	0	0	1674	0	0	1572	0
Flt Permitted		0.982			0.999			0.996			0.991	
Satd. Flow (perm)	0	1383	0	0	1559	0	0	1674	0	0	1572	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	272	0	0	144	0	0	439	0	0	641	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	91.6%											
Analysis Period (min)	15											
	ICU Level of Service F											

Intersection	
Intersection Delay, s/veh	95.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	96	85	80	4	53	82	34	382	6	114	435	66
Future Vol, veh/h	96	85	80	4	53	82	34	382	6	114	435	66
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	48	5	21	0	7	4	16	8	0	32	15	41
Mvmt Flow	100	89	83	4	55	85	35	398	6	119	453	69
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	26.2	16	46	176.7
HCM LOS	D	C	E	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	37%	3%	19%
Vol Thru, %	91%	33%	38%	71%
Vol Right, %	1%	31%	59%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	422	261	139	615
LT Vol	34	96	4	114
Through Vol	382	85	53	435
RT Vol	6	80	82	66
Lane Flow Rate	440	272	145	641
Geometry Grp	1	1	1	1
Degree of Util (X)	0.883	0.628	0.321	1.311
Departure Headway (Hd)	7.798	9.066	8.857	7.367
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	470	402	408	493
Service Time	5.798	7.066	6.857	5.424
HCM Lane V/C Ratio	0.936	0.677	0.355	1.3
HCM Control Delay	46	26.2	16	176.7
HCM Lane LOS	E	D	C	F
HCM 95th-tile Q	9.4	4.1	1.4	27.5

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (vph)	810	87	181	703	93	179
Future Volume (vph)	810	87	181	703	93	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Satd. Flow (prot)	1841	0	1761	1958	1563	0
Flt Permitted			0.064		0.983	
Satd. Flow (perm)	1841	0	119	1958	1563	0
Right Turn on Red		Yes				No
Satd. Flow (RTOR)	6					
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	906	0	183	710	275	0
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases	2		6		4	
Detector Phase	2		1	6	4	
Switch Phase						
Minimum Initial (s)	15.0		5.0	15.0	5.0	
Minimum Split (s)	25.2		12.0	22.2	15.0	
Total Split (s)	52.0		13.0	65.0	45.0	
Total Split (%)	47.3%		11.8%	59.1%	40.9%	
Yellow Time (s)	4.2		3.0	4.2	4.2	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0	
Total Lost Time (s)	5.2		4.0	5.2	5.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max		None	C-Max	None	
Act Effect Green (s)	58.2		72.4	71.2	28.4	
Actuated g/C Ratio	0.53		0.66	0.65	0.26	
v/c Ratio	0.93		0.86	0.56	0.68	
Control Delay	42.0		44.6	15.0	45.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	42.0		44.6	15.0	45.0	
LOS	D		D	B	D	
Approach Delay	42.0			21.1	45.0	
Approach LOS	D			C	D	
Queue Length 50th (ft)	564		72	308	175	
Queue Length 95th (ft)	#960		m#124	m448	242	
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)			150			
Base Capacity (vph)	977		212	1267	565	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.93		0.86	0.56	0.49	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 33.4

Intersection LOS: C

Intersection Capacity Utilization 90.2%

ICU Level of Service E

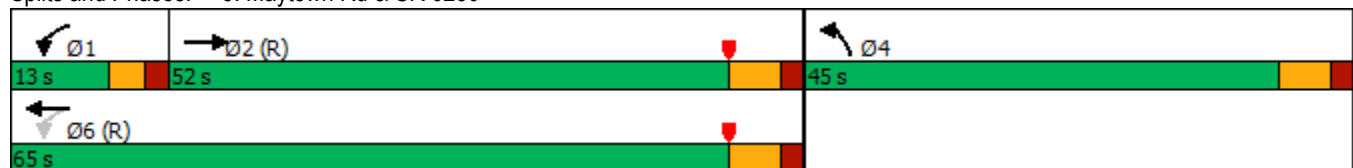
Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 Build
SAT Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱	
Traffic Volume (veh/h)	810	87	181	703	93	179
Future Volume (veh/h)	810	87	181	703	93	179
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	818	86	183	710	94	181
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	936	98	289	1451	119	229
Arrive On Green	0.60	0.59	0.04	0.47	0.21	0.20
Sat Flow, veh/h	1570	165	1927	2090	562	1083
Grp Volume(v), veh/h	0	904	183	710	276	0
Grp Sat Flow(s),veh/h/ln	0	1735	1927	2090	1651	0
Q Serve(g_s), s	0.0	48.4	3.7	25.9	17.4	0.0
Cycle Q Clear(g_c), s	0.0	48.4	3.7	25.9	17.4	0.0
Prop In Lane		0.10	1.00		0.34	0.66
Lane Grp Cap(c), veh/h	0	1034	289	1451	349	0
V/C Ratio(X)	0.00	0.87	0.63	0.49	0.79	0.00
Avail Cap(c_a), veh/h	0	1034	327	1451	598	0
HCM Platoon Ratio	1.00	1.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	18.8	22.8	15.9	41.4	0.0
Incr Delay (d2), s/veh	0.0	10.2	3.3	1.2	13.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	27.8	5.6	19.7	13.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	29.0	26.1	17.1	54.8	0.0
LnGrp LOS	A	C	C	B	D	A
Approach Vol, veh/h	904			893	276	
Approach Delay, s/veh	29.0			18.9	54.8	
Approach LOS	C			B	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.8	70.8		28.4		81.6
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	5.7	50.4		19.4		27.9
Green Ext Time (p_c), s	0.1	0.0		2.8		18.3
Intersection Summary						
HCM 6th Ctrl Delay			28.1			
HCM 6th LOS			C			
Notes						
User approved volume balancing among the lanes for turning movement.						

Lanes, Volumes, Timings
5: SR 0230 & Groff Ave

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1051	0	1	1056	128	0	0	1	74	0	37
Future Volume (vph)	17	1051	0	1	1056	128	0	0	1	74	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	12	12	11	12	11	12	12
Grade (%)		-3%			6%			-2%			-3%	
Storage Length (ft)	75		0	75		0	0		0	0		75
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1771	1846	0	1751	1738	0	0	1605	0	1771	1639	0
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1200			1060			200			1000	
Travel Time (s)		20.5			18.1			5.5			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	1095	0	1	1233	0	0	1	0	77	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 80.8% ICU Level of Service D

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	20.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	1051	0	1	1056	128	0	0	1	74	0	37
Future Vol, veh/h	17	1051	0	1	1056	128	0	0	1	74	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	6	-	-	-2	-	-	-3	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	18	1095	0	1	1100	133	0	0	1	77	0	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1233	0	0	1095	0	0	2319	2366	1095	2301	2300	1167
Stage 1	-	-	-	-	-	-	1131	1131	-	1169	1169	-
Stage 2	-	-	-	-	-	-	1188	1235	-	1132	1131	-
Critical Hdwy	3.7	-	-	5.5	-	-	6.7	6.1	6	6.5	5.9	5.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.7	5.1	-	5.5	4.9	-
Follow-up Hdwy	3	-	-	3	-	-	3	4	3.1	3	4	3.1
Pot Cap-1 Maneuver	541	-	-	343	-	-	36	46	289	~ 42	58	272
Stage 1	-	-	-	-	-	-	309	318	-	315	327	-
Stage 2	-	-	-	-	-	-	288	288	-	329	339	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	541	-	-	343	-	-	30	44	289	~ 41	56	272
Mov Cap-2 Maneuver	-	-	-	-	-	-	30	44	-	~ 41	56	-
Stage 1	-	-	-	-	-	-	299	308	-	305	326	-
Stage 2	-	-	-	-	-	-	246	287	-	317	328	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	17.5	\$ 425.3
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	289	541	-	-	343	-	-	41	272
HCM Lane V/C Ratio	0.004	0.033	-	-	0.003	-	-	1.88	0.142
HCM Control Delay (s)	17.5	11.9	-	-	15.5	-	-	\$ 627.7	20.4
HCM Lane LOS	C	B	-	-	C	-	-	F	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	8.1	0.5

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	829	51	160	909	16	268	3	168	36	4	15
Future Volume (vph)	22	829	51	160	909	16	268	3	168	36	4	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	11	12	10	11	14	11	12	12	12	14	12
Grade (%)		-7%			3%			-5%			-6%	
Storage Length (ft)	200		150	250		100	200		0	100		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1652	1783	1584	1572	1697	1608	1694	1572	0	1761	1740	0
Flt Permitted	0.215			0.066			0.744			0.530		
Satd. Flow (perm)	374	1783	1584	109	1697	1573	1327	1572	0	983	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			29			177			16
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1060			1340			300			300	
Travel Time (s)		18.1			22.8			8.2			8.2	
Confl. Peds. (#/hr)	2					2						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	873	54	168	957	17	282	180	0	38	20	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	3.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	21.8	21.8	21.8	12.5	21.8	21.8	13.0	13.0		13.0	13.0	
Total Split (s)	57.0	57.0	57.0	22.0	79.0	79.0	31.0	31.0		31.0	31.0	
Total Split (%)	51.8%	51.8%	51.8%	20.0%	71.8%	71.8%	28.2%	28.2%		28.2%	28.2%	
Yellow Time (s)	4.8	4.8	4.8	3.0	4.8	4.8	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.8	5.8	5.8	4.5	5.8	5.8	4.9	4.9		4.9	4.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	56.4	56.4	56.4	75.2	73.9	73.9	25.4	25.4		25.4	25.4	
Actuated g/C Ratio	0.51	0.51	0.51	0.68	0.67	0.67	0.23	0.23		0.23	0.23	
v/c Ratio	0.12	0.96	0.06	0.68	0.84	0.02	0.92	0.36		0.17	0.05	
Control Delay	20.2	40.4	3.6	42.2	16.2	2.7	77.3	7.6		35.7	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	20.2	40.4	3.6	42.2	16.2	2.7	77.3	7.6		35.7	16.9	
LOS	C	D	A	D	B	A	E	A		D	B	
Approach Delay		37.8			19.8			50.1			29.2	
Approach LOS		D			B			D			C	
Queue Length 50th (ft)	8	363	0	88	206	0	194	2		21	2	
Queue Length 95th (ft)	m14	m#806	m5	m134	399	m1	#351	57		51	22	

Lanes, Volumes, Timings
7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	980			1260			220			220		
Turn Bay Length (ft)	200		150	250		100	200			100		
Base Capacity (vph)	191	914	853	307	1140	1066	314	507		233	425	
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	0.12	0.96	0.06	0.55	0.84	0.02	0.90	0.36		0.16	0.05	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 31.9

Intersection LOS: C

Intersection Capacity Utilization 99.8%

ICU Level of Service F

Analysis Period (min) 15

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.

Splits and Phases: 7: Giant Plaza Dr/Carey Ln & SR 0230



HCM 6th Signalized Intersection Summary

7: Giant Plaza Dr/Carey Ln & SR 0230

2033 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	829	51	160	909	16	268	3	168	36	4	15
Future Volume (veh/h)	22	829	51	160	909	16	268	3	168	36	4	15
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	2061	2047	2061	1750	1736	1820	1986	1986	1986	2024	2104	2024
Adj Flow Rate, veh/h	23	873	32	168	957	12	282	3	112	38	4	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	429	1165	993	516	1187	1053	390	10	361	295	126	284
Arrive On Green	1.00	1.00	1.00	0.15	1.00	1.00	0.22	0.22	0.21	0.22	0.22	0.21
Sat Flow, veh/h	639	2047	1743	1666	1736	1540	1488	44	1646	1382	576	1296
Grp Volume(v), veh/h	23	873	32	168	957	12	282	0	115	38	0	13
Grp Sat Flow(s),veh/h/ln	639	2047	1743	1666	1736	1540	1488	0	1690	1382	0	1871
Q Serve(g_s), s	0.0	0.0	0.0	4.3	0.0	0.0	20.1	0.0	6.3	2.6	0.0	0.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.3	0.0	0.0	20.2	0.0	6.3	8.4	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.69
Lane Grp Cap(c), veh/h	429	1165	993	516	1187	1053	390	0	370	295	0	410
V/C Ratio(X)	0.05	0.75	0.03	0.33	0.81	0.01	0.72	0.00	0.31	0.13	0.00	0.03
Avail Cap(c_a), veh/h	429	1165	993	659	1187	1053	417	0	401	320	0	444
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)	1.00	1.00	1.00	0.54	0.54	0.54	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.4	0.0	0.0	41.5	0.0	36.4	39.3	0.0	34.1
Incr Delay (d2), s/veh	0.2	4.4	0.1	0.2	3.3	0.0	5.7	0.0	0.5	0.2	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(95%),veh/ln	0.1	2.6	0.0	2.2	2.0	0.0	12.6	0.0	4.9	1.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	4.4	0.1	6.6	3.3	0.0	47.2	0.0	36.9	39.5	0.0	34.1
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	C
Approach Vol, veh/h	928			1137			397			51		
Approach Delay, s/veh	4.2			3.7			44.2			38.1		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4			6	8					
Phs Duration (G+Y+Rc), s	12.6	68.4	29.0			81.0	29.0					
Change Period (Y+Rc), s	5.5	6.8	* 5.9			6.8	* 5.9					
Max Green Setting (Gmax), s	16.5	50.2	* 25			72.2	* 25					
Max Q Clear Time (g_c+I1), s	6.8	2.5	10.9			2.5	22.7					
Green Ext Time (p_c), s	0.3	1.2	0.1			1.3	0.4					

Intersection Summary

HCM 6th Ctrl Delay 11.0
HCM 6th LOS B

Notes

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

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	773	13	4	891	69	10	3	11	64	41	134
Future Volume (vph)	112	773	13	4	891	69	10	3	11	64	41	134
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	14	12	12	12	12
Grade (%)		4%			-4%			0%			-1%	
Storage Length (ft)	275		0	225		225	0		0	300		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1676	1743	0	1744	1818	1561	0	1763	0	1719	1574	0
Flt Permitted	0.158			0.342				0.570		0.740		
Satd. Flow (perm)	279	1743	0	628	1818	1561	0	1026	0	1339	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				80		12			136	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1340			610			200			300	
Travel Time (s)		22.8			10.4			5.5			8.2	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	845	0	4	958	74	0	26	0	69	188	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		
Detector Phase	1	6		2	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	15.0		15.0	15.0	15.0	3.0	3.0		3.0	3.0	
Minimum Split (s)	11.0	22.4		22.4	22.4	22.4	13.0	13.0		13.0	13.0	
Total Split (s)	14.0	82.0		68.0	68.0	68.0	28.0	28.0		28.0	28.0	
Total Split (%)	12.7%	74.5%		61.8%	61.8%	61.8%	25.5%	25.5%		25.5%	25.5%	
Yellow Time (s)	3.0	4.4		4.4	4.4	4.4	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.5	2.0		2.0	2.0	2.0	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0		-1.0		-1.0	-1.0	
Total Lost Time (s)	4.5	5.4		5.4	5.4	5.4		4.6		4.6	4.6	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.6	87.7		74.7	74.7	74.7		12.3		12.3	12.3	
Actuated g/C Ratio	0.81	0.80		0.68	0.68	0.68		0.11		0.11	0.11	
v/c Ratio	0.36	0.61		0.01	0.78	0.07		0.21		0.46	0.63	
Control Delay	8.3	9.1		5.2	17.5	0.9		31.6		54.5	24.4	
Queue Delay	0.0	0.0		0.0	0.4	0.0		0.0		0.0	0.0	
Total Delay	8.3	9.1		5.2	17.9	0.9		31.6		54.5	24.4	
LOS	A	A		A	B	A		C		D	C	
Approach Delay		9.0			16.6			31.6			32.5	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	23	206		1	475	2		9		46	34	
Queue Length 95th (ft)	m33	m287		m2	#770	m3		35		88	102	

Lanes, Volumes, Timings
10: Driveway/Market Sq Dr & SR 0230

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1260			530			120			220	
Turn Bay Length (ft)	275			225		225				300		
Base Capacity (vph)	345	1389		426	1235	1086		227		284	441	
Starvation Cap Reductn	0	0		0	48	0		0		0	0	
Spillback Cap Reductn	0	13		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.35	0.61		0.01	0.81	0.07		0.11		0.24	0.43	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 15.3

Intersection LOS: B

Intersection Capacity Utilization 80.2%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 10: Driveway/Market Sq Dr & SR 0230



HCM 6th Signalized Intersection Summary

10: Driveway/Market Sq Dr & SR 0230

2033 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	773	13	4	891	69	10	3	11	64	41	134
Future Volume (veh/h)	112	773	13	4	891	69	10	3	11	64	41	134
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		0.99	1.00		0.99
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	1711	1697	1711	1949	1935	1949	1800	1872	1800	1837	1837	1837
Adj Flow Rate, veh/h	120	831	12	4	958	61	11	3	8	69	44	73
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	509	1349	19	554	1391	1187	67	26	25	194	62	103
Arrive On Green	0.10	1.00	1.00	1.00	1.00	1.00	0.09	0.10	0.09	0.10	0.10	0.09
Sat Flow, veh/h	1629	1668	24	680	1935	1652	176	263	251	1374	619	1027
Grp Volume(v), veh/h	120	0	843	4	958	61	22	0	0	69	0	117
Grp Sat Flow(s),veh/h/ln	1629	0	1692	680	1935	1652	690	0	0	1374	0	1646
Q Serve(g_s), s	1.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	7.6
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0	5.9	0.0	7.6
Prop In Lane	1.00		0.01	1.00		1.00	0.50		0.36	1.00		0.62
Lane Grp Cap(c), veh/h	509	0	1368	554	1391	1187	112	0	0	194	0	165
V/C Ratio(X)	0.24	0.00	0.62	0.01	0.69	0.05	0.20	0.00	0.00	0.36	0.00	0.71
Avail Cap(c_a), veh/h	570	0	1368	554	1391	1187	273	0	0	348	0	350
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)	0.27	0.00	0.27	0.74	0.74	0.74	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.5	0.0	0.0	0.0	0.0	0.0	45.6	0.0	0.0	47.2	0.0	48.2
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.0	2.1	0.1	0.8	0.0	0.0	1.1	0.0	5.5
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(95%),veh/ln	0.7	0.0	0.4	0.0	1.5	0.0	1.1	0.0	0.0	3.4	0.0	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.6	0.0	0.6	0.0	2.1	0.1	46.5	0.0	0.0	48.3	0.0	53.7
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	D
Approach Vol, veh/h	963			1023			22			186		
Approach Delay, s/veh	0.8			2.0			46.5			51.7		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.9	84.5	15.7		94.3		15.7					
Change Period (Y+Rc), s	5.5	6.4	5.6		6.4		5.6					
Max Green Setting (Gmax), s	8.5	61.6	22.4		75.6		22.4					
Max Q Clear Time (g_c+I1), s	4.4	2.5	9.6		2.5		9.7					
Green Ext Time (p_c), s	0.1	1.4	0.5		1.1		0.0					
Intersection Summary												
HCM 6th Ctrl Delay				6.1								
HCM 6th LOS				A								

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	750	25	21	768	14	69	25	18	16	21	78
Future Volume (vph)	57	750	25	21	768	14	69	25	18	16	21	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	10	10	12	10	12	12	12	15	12
Grade (%)		3%			-3%			3%			-4%	
Storage Length (ft)	125		0	125		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1651	1747	0	1620	1700	0	1541	1661	0	0	1823	0
Flt Permitted	0.294			0.297			0.525				0.951	
Satd. Flow (perm)	511	1747	0	506	1700	0	852	1661	0	0	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			1			19			82	
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		610			1000			350			1000	
Travel Time (s)		10.4			17.0			6.8			19.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	815	0	22	823	0	73	45	0	0	121	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.9	21.9		21.9	21.9		13.0	13.0		13.0	13.0	
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0		46.0	46.0	
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%		41.8%	41.8%	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.6	1.6		1.6	1.6		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)	4.9	4.9		4.9	4.9		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	86.3	86.3		86.3	86.3		13.8	13.8			13.8	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.13	0.13			0.13	
v/c Ratio	0.15	0.59		0.06	0.62		0.68	0.20			0.42	
Control Delay	6.4	9.5		4.0	8.2		75.2	28.8			20.3	
Queue Delay	0.0	0.1		0.0	0.3		0.0	0.0			0.0	
Total Delay	6.4	9.6		4.0	8.5		75.2	28.8			20.3	
LOS	A	A		A	A		E	C			C	
Approach Delay		9.4			8.4			57.5			20.3	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	13	234		3	196		50	17			25	
Queue Length 95th (ft)	m25	263		11	392		96	48			76	
Internal Link Dist (ft)		530			920			270			920	

Lanes, Volumes, Timings
13: Sheaffer Rd & SR 0230

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	125			125			75					
Base Capacity (vph)	400	1370		396	1333		317	631			702	
Starvation Cap Reductn	0	78		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	111		0	0			5	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.15	0.63		0.06	0.67		0.23	0.07			0.17	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 12.5

Intersection LOS: B

Intersection Capacity Utilization 72.1%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 13: Sheaffer Rd & SR 0230



HCM 6th Signalized Intersection Summary 13: Sheaffer Rd & SR 0230

2033 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	750	25	21	768	14	69	25	18	16	21	78
Future Volume (veh/h)	57	750	25	21	768	14	69	25	18	16	21	78
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	1722	1736	1750	1912	1912	1912	1722	1750	1750	1949	2027	1949
Adj Flow Rate, veh/h	60	789	21	22	808	14	73	26	7	17	22	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	0	0	0	0	2	0	0	0	0	0
Cap, veh/h	495	1396	37	637	1555	27	174	107	29	62	53	67
Arrive On Green	1.00	1.00	1.00	0.83	0.83	0.82	0.08	0.08	0.07	0.07	0.08	0.07
Sat Flow, veh/h	613	1683	45	688	1873	32	1239	1328	358	275	661	840
Grp Volume(v), veh/h	60	0	810	22	0	822	73	0	33	74	0	0
Grp Sat Flow(s),veh/h/ln	613	0	1728	688	0	1906	1239	0	1685	1777	0	0
Q Serve(g_s), s	1.9	0.0	0.0	0.6	0.0	14.2	1.2	0.0	2.0	1.9	0.0	0.0
Cycle Q Clear(g_c), s	16.1	0.0	0.0	0.6	0.0	14.2	5.5	0.0	2.0	4.4	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.21	0.23		0.47
Lane Grp Cap(c), veh/h	495	0	1434	637	0	1582	174	0	135	167	0	0
V/C Ratio(X)	0.12	0.00	0.57	0.03	0.00	0.52	0.42	0.00	0.24	0.44	0.00	0.00
Avail Cap(c_a), veh/h	495	0	1434	637	0	1582	536	0	628	674	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)	0.77	0.00	0.77	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.3	0.0	0.0	1.6	0.0	2.8	49.0	0.0	47.6	48.8	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.2	0.1	0.0	1.2	1.6	0.0	0.9	1.9	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(95%),veh/ln	0.2	0.0	0.9	0.1	0.0	5.9	3.6	0.0	1.6	3.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.0	1.2	1.7	0.0	4.0	50.6	0.0	48.5	50.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h	870			844			106			74		
Approach Delay, s/veh	1.3			4.0			49.9			50.7		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	96.2			13.8			96.2			13.8		
Change Period (Y+Rc), s	* 5.9			6.0			* 5.9			6.0		
Max Green Setting (Gmax), s	* 58			40.0			* 58			40.0		
Max Q Clear Time (g_c+I1), s	2.0			6.4			16.2			7.5		
Green Ext Time (p_c), s	35.3			0.2			29.7			0.4		

Intersection Summary

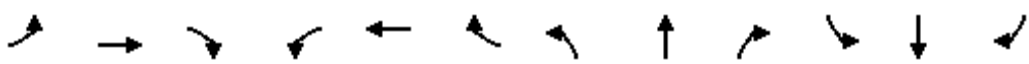
HCM 6th Ctrl Delay	7.1
HCM 6th LOS	A

Notes

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

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (vph)	0	0	0	593	1	62	371	185	0	0	205	29
Future Volume (vph)	0	0	0	593	1	62	371	185	0	0	205	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	11	10	11	11	12	12	11	16
Grade (%)		3%			-2%			2%			-2%	
Storage Length (ft)	0		0	0		400	200		0	0		75
Storage Lanes	0		0	0		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	1640	1442	1574	1641	0	0	1740	1578
Flt Permitted					0.952		0.448					
Satd. Flow (perm)	0	0	0	0	1640	1442	742	1641	0	0	1740	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164						155
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			550			996	
Travel Time (s)		27.3			27.3			9.4			17.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	4%	5%	2%	2%	1%	11%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	619	65	386	193	0	0	214	30
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				3.0	3.0	3.0	7.0	12.0			12.0	12.0
Minimum Split (s)				12.5	12.5	12.5	13.0	22.0			22.0	22.0
Total Split (s)				25.0	25.0	25.0	13.0	35.0			22.0	22.0
Total Split (%)				41.7%	41.7%	41.7%	21.7%	58.3%			36.7%	36.7%
Yellow Time (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
All-Red Time (s)				2.5	2.5	2.5	2.0	2.0			2.0	2.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0			-1.0	-1.0
Total Lost Time (s)					4.5	4.5	5.0	5.0			5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Recall Mode				None	None	None	None	Min			Min	Min
Act Effect Green (s)					20.5	20.5	28.6	28.6			15.6	15.6
Actuated g/C Ratio					0.35	0.35	0.49	0.49			0.27	0.27
v/c Ratio					1.08	0.11	0.81	0.24			0.46	0.06
Control Delay					84.2	0.4	27.7	9.6			21.7	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					84.2	0.4	27.7	9.6			21.7	0.2
LOS					F	A	C	A			C	A
Approach Delay					76.3			21.7			19.0	
Approach LOS					E			C			B	
Queue Length 50th (ft)					~264	0	85	36			63	0
Queue Length 95th (ft)					#437	0	#198	70			117	0
Internal Link Dist (ft)		920			920			470			916	

Lanes, Volumes, Timings
3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)						400	200					75
Base Capacity (vph)					574	611	475	840			505	568
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					1.08	0.11	0.81	0.23			0.42	0.05

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 46.0

Intersection LOS: D

Intersection Capacity Utilization 132.2%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp



HCM 6th Signalized Intersection Summary

3: Cloverleaf Road & PA 283 On-Ramp/PA 283 Off-Ramp

2033 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↶	↶	↶	↶			↶	↶
Traffic Volume (veh/h)	0	0	0	593	1	62	371	185	0	0	205	29
Future Volume (veh/h)	0	0	0	593	1	62	371	185	0	0	205	29
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1846	1875	1875	1722	1707	0	0	1860	1787
Adj Flow Rate, veh/h				618	1	0	386	193	0	0	214	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	0	0	4	5	0	0	1	11
Cap, veh/h				653	1		505	793	0	0	432	
Arrive On Green				0.35	0.37	0.00	0.14	0.46	0.00	0.00	0.23	0.00
Sat Flow, veh/h				1783	3	1589	1640	1707	0	0	1860	1514
Grp Volume(v), veh/h				619	0	0	386	193	0	0	214	0
Grp Sat Flow(s),veh/h/ln				1785	0	1589	1640	1707	0	0	1860	1514
Q Serve(g_s), s				18.9	0.0	0.0	8.0	3.8	0.0	0.0	5.6	0.0
Cycle Q Clear(g_c), s				18.9	0.0	0.0	8.0	3.8	0.0	0.0	5.6	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				654	0		505	793	0	0	432	
V/C Ratio(X)				0.95	0.00		0.76	0.24	0.00	0.00	0.50	
Avail Cap(c_a), veh/h				654	0		505	915	0	0	565	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.7	0.0	0.0	15.1	9.1	0.0	0.0	18.7	0.0
Incr Delay (d2), s/veh				23.0	0.0	0.0	6.8	0.6	0.0	0.0	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln				16.7	0.0	0.0	7.0	2.2	0.0	0.0	4.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				40.7	0.0	0.0	22.0	9.6	0.0	0.0	21.8	0.0
LnGrp LOS				D	A		C	A	A	A	C	
Approach Vol, veh/h					619			579			214	
Approach Delay, s/veh					40.7			17.8			21.8	
Approach LOS					D			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			13.0	18.0		25.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		5.5				
Max Green Setting (Gmax), s		29.0			7.0	16.0		19.5				
Max Q Clear Time (g_c+I1), s		5.8			10.0	7.6		20.9				
Green Ext Time (p_c), s		3.9			0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				28.5								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	386	0	0	0	0	522	585	91	708	0
Future Volume (vph)	25	0	386	0	0	0	0	522	585	91	708	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	12	12	12	12	11	12	11	11	12
Grade (%)		-3%			3%			-2%			-2%	
Storage Length (ft)	325		0	0		0	0		0	75		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1621	1554	0	0	0	0	1674	0	1762	1801	0
Flt Permitted		0.950								0.950		
Satd. Flow (perm)	0	1621	1554	0	0	0	0	1674	0	1762	1801	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			325			550	
Travel Time (s)		27.3			27.3			5.5			9.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	13%	0%	2%	2%	2%	2%	2%	4%	2%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	415	0	0	0	0	1190	0	98	761	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 132.2%

ICU Level of Service H

Analysis Period (min) 15

HCM 6th TWSC
6: Cloverleaf Road & PA 283 EB Off-Ramp/PA 283 EB On-Ramp

2033 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	9.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↰		↱	↰	
Traffic Vol, veh/h	25	0	386	0	0	0	0	522	585	91	708	0
Future Vol, veh/h	25	0	386	0	0	0	0	522	585	91	708	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-3	-	-	3	-	-	-2	-	-	-2	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	13	0	2	2	2	2	2	4	2	0	3	2
Mvmt Flow	27	0	415	0	0	0	0	561	629	98	761	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1518	1518	761	-	0	0	561	0	0
Stage 1	957	957	-	-	-	-	-	-	-
Stage 2	561	561	-	-	-	-	-	-	-
Critical Hdwy	6.6	5.9	5.92	-	-	-	3.9	-	-
Critical Hdwy Stg 1	4.93	4.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	4.93	4.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.1	4	3.1	-	-	-	3	-	-
Pot Cap-1 Maneuver	129	155	453	0	-	-	818	-	0
Stage 1	460	397	-	0	-	-	-	-	0
Stage 2	679	564	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	114	0	453	-	-	-	818	-	-
Mov Cap-2 Maneuver	114	0	-	-	-	-	-	-	-
Stage 1	460	0	-	-	-	-	-	-	-
Stage 2	598	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	53.9	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	114	453	818	-
HCM Lane V/C Ratio	-	-	0.236	0.916	0.12	-
HCM Control Delay (s)	-	-	46.1	54.4	10	-
HCM Lane LOS	-	-	E	F	A	-
HCM 95th %tile Q(veh)	-	-	0.9	10.3	0.4	-

Lanes, Volumes, Timings
10: Cloverleaf Rd/Cloverleaf Road & Merts Drive

2033 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	12	14	1080	1110	3
Future Volume (vph)	6	12	14	1080	1110	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	12
Grade (%)	0%			-2%	2%	
Satd. Flow (prot)	1557	0	0	1800	1799	0
Flt Permitted	0.984			0.999		
Satd. Flow (perm)	1557	0	0	1800	1799	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	750			2175	325	
Travel Time (s)	20.5			37.1	5.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	17%	0%	0%	3%	1%	33%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	0	1164	1184	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	78.0%			ICU Level of Service D		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	12	14	1080	1110	3
Future Vol, veh/h	6	12	14	1080	1110	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	1	33
Mvmt Flow	6	13	15	1149	1181	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2362	1183	1184	0	-	0
Stage 1	1183	-	-	-	-	-
Stage 2	1179	-	-	-	-	-
Critical Hdwy	6.57	6.2	3.9	-	-	-
Critical Hdwy Stg 1	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.57	-	-	-	-	-
Follow-up Hdwy	3.2	3.1	3	-	-	-
Pot Cap-1 Maneuver	36	241	523	-	-	-
Stage 1	292	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	33	241	523	-	-	-
Mov Cap-2 Maneuver	33	-	-	-	-	-
Stage 1	269	-	-	-	-	-
Stage 2	293	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	65.6	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	523	-	78	-	-
HCM Lane V/C Ratio	0.028	-	0.245	-	-
HCM Control Delay (s)	12.1	0	65.6	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	25	116	12	22	34	86	913	9	20	923	189
Future Volume (vph)	159	25	116	12	22	34	86	913	9	20	923	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1643	0	1572	1634	0	1620	1713	0	1550	1716	0
Flt Permitted	0.719			0.663			0.109			0.125		
Satd. Flow (perm)	1226	1643	0	1097	1634	0	186	1713	0	204	1716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		117			36			1			29	
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1000			1000			1240			2175	
Travel Time (s)		19.5			19.5			21.1			37.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	148	0	13	59	0	91	970	0	21	1171	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effect Green (s)	12.9	12.9		12.9	12.9		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.61	0.61		0.61	0.61	
v/c Ratio	0.63	0.33		0.06	0.16		0.81	0.93		0.17	1.11	
Control Delay	32.3	8.5		18.0	10.9		50.4	23.8		10.2	79.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	32.3	8.5		18.0	10.9		50.4	23.8		10.2	79.1	
LOS	C	A		B	B		D	C		B	E	
Approach Delay		21.1			12.2			26.1			77.9	
Approach LOS		C			B			C			E	
Queue Length 50th (ft)	53	9		4	6		29	359		3	~514	
Queue Length 95th (ft)	107	47		15	30		m#56	m#547		15	#744	
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		
Base Capacity (vph)	306	498		274	435		113	1044		124	1057	
Starvation Cap Reductn	0	0		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	0.55	0.30		0.05	0.14		0.81	0.93		0.17	1.11	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 48.5

Intersection LOS: D

Intersection Capacity Utilization 100.2%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary
11: Cloverleaf Rd & Schwanger Rd

2033 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	25	116	12	22	34	86	913	9	20	923	189
Future Volume (veh/h)	159	25	116	12	22	34	86	913	9	20	923	189
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	167	26	95	13	23	22	91	961	8	21	972	165
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	358	73	267	274	161	154	163	1179	10	225	1026	174
Arrive On Green	0.19	0.19	0.17	0.19	0.19	0.17	0.43	0.43	0.42	0.64	0.64	0.62
Sat Flow, veh/h	1435	389	1421	1189	855	818	506	1851	15	582	1612	274
Grp Volume(v), veh/h	167	0	121	13	0	45	91	0	969	21	0	1137
Grp Sat Flow(s),veh/h/ln	1435	0	1810	1189	0	1673	506	0	1866	582	0	1886
Q Serve(g_s), s	6.6	0.0	3.5	0.6	0.0	1.4	5.1	0.0	27.4	1.8	0.0	33.1
Cycle Q Clear(g_c), s	8.0	0.0	3.5	4.1	0.0	1.4	38.2	0.0	27.4	29.2	0.0	33.1
Prop In Lane	1.00		0.79	1.00		0.49	1.00		0.01	1.00		0.15
Lane Grp Cap(c), veh/h	358	0	341	274	0	315	163	0	1188	225	0	1201
V/C Ratio(X)	0.47	0.00	0.36	0.05	0.00	0.14	0.56	0.00	0.82	0.09	0.00	0.95
Avail Cap(c_a), veh/h	446	0	452	347	0	418	163	0	1188	225	0	1201
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.42	0.00	0.42	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.6	0.0	21.5	23.0	0.0	20.5	35.1	0.0	14.1	20.9	0.0	10.0
Incr Delay (d2), s/veh	0.9	0.0	0.6	0.1	0.0	0.2	5.7	0.0	2.7	0.8	0.0	16.0
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(95%),veh/ln	3.8	0.0	2.6	0.3	0.0	0.9	2.8	0.0	15.4	0.5	0.0	19.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	0.0	22.2	23.1	0.0	20.7	40.8	0.0	16.8	21.7	0.0	26.1
LnGrp LOS	C	A	C	C	A	C	D	A	B	C	A	C
Approach Vol, veh/h	288			58			1060			1158		
Approach Delay, s/veh	23.6			21.3			18.9			26.0		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.7			16.3			43.7			16.3		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	29.4			10.0			35.1			6.1		
Green Ext Time (p_c), s	3.9			0.4			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	22.7											
HCM 6th LOS	C											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	13	25	0	149	16	855	7	164	904	7
Future Volume (vph)	5	1	13	25	0	149	16	855	7	164	904	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	0		0	0		100
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1596	0	0	1670	0	0	1714	1648
Flt Permitted		0.705			0.948			0.930			0.757	
Satd. Flow (perm)	0	1227	1581	0	1524	0	0	1555	0	0	1308	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		157			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	14	0	183	0	0	924	0	0	1125	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.4	8.4		8.4			42.1			42.1	42.1
Actuated g/C Ratio		0.14	0.14		0.14			0.70			0.70	0.70
v/c Ratio		0.03	0.05		0.52			0.85			1.23	0.01
Control Delay		21.2	0.4		12.1			17.9			120.9	0.0
Queue Delay		0.0	0.0		0.0			0.0			0.0	0.0
Total Delay		21.2	0.4		12.1			17.9			120.9	0.0
LOS		C	A		B			B			F	A
Approach Delay		6.6			12.1			17.9			120.1	
Approach LOS		A			B			B			F	
Queue Length 50th (ft)		2	0		9			177			~544	0
Queue Length 95th (ft)		10	0		54			#530			m#525	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125									100
Base Capacity (vph)		235	347		419			1090			917	1168
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		0.03	0.04		0.44			0.85			1.23	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.23

Intersection Signal Delay: 68.6

Intersection LOS: E

Intersection Capacity Utilization 138.6%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	13	25	0	149	16	855	7	164	904	7
Future Volume (veh/h)	5	1	13	25	0	149	16	855	7	164	904	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	7	26	0	153	17	900	7	173	952	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	258	43	246	91	13	210	61	741	6	146	554	1134
Arrive On Green	0.14	0.16	0.16	0.14	0.00	0.14	0.67	0.69	0.67	1.00	1.00	1.00
Sat Flow, veh/h	954	277	1586	145	85	1353	0	1080	8	113	808	1652
Grp Volume(v), veh/h	6	0	7	179	0	0	924	0	0	1125	0	7
Grp Sat Flow(s),veh/h/ln	1231	0	1586	1583	0	0	1088	0	0	920	0	1652
Q Serve(g_s), s	0.0	0.0	0.2	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	6.6	0.0	0.0	40.2	0.0	0.0	40.2	0.0	0.0
Prop In Lane	0.83		1.00	0.15		0.85	0.02		0.01	0.15		1.00
Lane Grp Cap(c), veh/h	281	0	246	288	0	0	790	0	0	685	0	1134
V/C Ratio(X)	0.02	0.00	0.03	0.62	0.00	0.00	1.17	0.00	0.00	1.64	0.00	0.01
Avail Cap(c_a), veh/h	326	0	304	345	0	0	790	0	0	685	0	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09
Uniform Delay (d), s/veh	21.8	0.0	21.5	24.6	0.0	0.0	14.4	0.0	0.0	5.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.5	0.0	0.0	89.7	0.0	0.0	289.2	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(95%),veh/ln	0.1	0.0	0.1	4.7	0.0	0.0	40.4	0.0	0.0	83.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	21.5	27.1	0.0	0.0	104.2	0.0	0.0	294.2	0.0	0.0
LnGrp LOS	C	A	C	C	A	A	F	A	A	F	A	A
Approach Vol, veh/h	13			179			924			1132		
Approach Delay, s/veh	21.7			27.1			104.2			292.4		
Approach LOS	C			C			F			F		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	46.2			13.8			46.2			13.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	42.2			2.2			42.2			8.6		
Green Ext Time (p_c), s	0.0			0.0			0.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	192.3											
HCM 6th LOS	F											

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	486	76	191	571	155	94	212	133	144	166	155
Future Volume (vph)	355	486	76	191	571	155	94	212	133	144	166	155
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	1809	1435	1527	1731	1592	1736	1785	0	1558	1624	1499
Flt Permitted	0.167			0.482			0.650			0.285		
Satd. Flow (perm)	276	1809	1435	775	1731	1592	1188	1785	0	467	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		39				247
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1025			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	362	496	78	195	583	158	96	352	0	147	169	158
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	13.5	37.5	37.5	24.0	24.0	24.0	14.0	23.5		14.0	23.5	23.5
Total Split (%)	18.0%	50.0%	50.0%	32.0%	32.0%	32.0%	18.7%	31.3%		18.7%	31.3%	31.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	32.0	32.0	32.0	18.5	18.5	18.5	24.2	16.5		25.7	19.3	19.3
Actuated g/C Ratio	0.43	0.43	0.43	0.25	0.25	0.25	0.33	0.22		0.35	0.26	0.26
v/c Ratio	1.39	0.63	0.11	1.01	1.35	0.27	0.22	0.82		0.53	0.40	0.28
Control Delay	220.4	21.2	0.3	99.5	198.3	1.5	15.1	41.9		21.9	27.6	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	220.4	21.2	0.3	99.5	198.3	1.5	15.1	41.9		21.9	27.6	1.8
LOS	F	C	A	F	F	A	B	D		C	C	A
Approach Delay		96.5			144.5			36.2			17.2	
Approach LOS		F			F			D			B	
Queue Length 50th (ft)	~188	176	0	~94	~365	0	26	137		42	67	0
Queue Length 95th (ft)	#349	277	0	#220	#551	6	55	#268		80	124	9
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	260	783	712	194	433	589	452	452		280	425	575
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.39	0.63	0.11	1.01	1.35	0.27	0.21	0.78		0.53	0.40	0.27

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 73.9

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.39

Intersection Signal Delay: 89.5

Intersection LOS: F

Intersection Capacity Utilization 100.4%

ICU Level of Service G

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
13.5 s	24 s	14 s	23.5 s
 Ø6	 Ø7	 Ø8	
37.5 s	14 s	23.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	355	486	76	191	571	155	94	212	133	144	166	155
Future Volume (veh/h)	355	486	76	191	571	155	94	212	133	144	166	155
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	362	496	72	195	583	0	96	216	133	147	169	76
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	288	808	684	281	456		462	266	164	322	404	357
Arrive On Green	0.11	0.44	0.44	0.51	0.51	0.00	0.07	0.21	0.20	0.11	0.25	0.25
Sat Flow, veh/h	1723	1837	1557	784	1794	1557	2069	1266	779	1576	1641	1450
Grp Volume(v), veh/h	362	496	72	195	583	0	96	0	349	147	169	76
Grp Sat Flow(s),veh/h/ln	1723	1837	1557	784	1794	1557	2069	0	2045	1576	1641	1450
Q Serve(g_s), s	8.0	15.1	2.0	16.9	18.5	0.0	2.5	0.0	11.8	5.1	6.3	3.0
Cycle Q Clear(g_c), s	8.0	15.1	2.0	18.5	18.5	0.0	2.5	0.0	11.8	5.1	6.3	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.38	1.00		1.00
Lane Grp Cap(c), veh/h	288	808	684	281	456		462	0	430	322	404	357
V/C Ratio(X)	1.26	0.61	0.11	0.69	1.28		0.21	0.00	0.81	0.46	0.42	0.21
Avail Cap(c_a), veh/h	288	808	684	281	456		537	0	492	322	404	357
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	15.7	12.0	19.2	17.9	0.0	19.7	0.0	27.6	19.6	23.0	21.8
Incr Delay (d2), s/veh	140.3	1.0	0.0	6.1	141.3	0.0	0.2	0.0	8.9	1.0	0.7	0.3
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(95%),veh/ln	22.3	9.4	1.1	4.2	33.8	0.0	2.2	0.0	11.0	3.2	4.2	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	160.3	16.7	12.0	25.3	159.2	0.0	19.9	0.0	36.5	20.6	23.7	22.1
LnGrp LOS	F	B	B	C	F		B	A	D	C	C	C
Approach Vol, veh/h	930			778			445			392		
Approach Delay, s/veh	72.2			125.7			32.9			22.3		
Approach LOS	E			F			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.5	24.0	14.0	21.3		37.5	11.4	23.9				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	7.0	17.5	7.0	16.5		31.0	7.0	16.5				
Max Q Clear Time (g_c+I1), s	10.5	21.0	7.6	13.8		17.6	5.0	8.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4		0.2	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay	74.0
HCM 6th LOS	E

Notes

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	42	0	0	328	44	494	84	355	419	113
Future Volume (vph)	0	0	42	0	0	328	44	494	84	355	419	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			-2%	
Storage Length (ft)	0		0	0		0	75		150	325		175
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	1611	0	0	1611	1752	1844	1567	1787	1863	1599
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	0	1611	0	0	1611	1752	1844	1567	1787	1863	1599
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		500			500			640			600	
Travel Time (s)		8.5			8.5			17.5			16.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	47	0	0	364	49	549	93	394	466	126
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 53.0%

ICU Level of Service A

Analysis Period (min) 15

HCM 6th TWSC
20: Cloverleaf Rd & Western Parcels Access/Eastern Parcels Access

2033 Build
SAT Peak Hour

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗	↗	↗	↗	↗
Traffic Vol, veh/h	0	0	42	0	0	328	44	494	84	355	419	113
Future Vol, veh/h	0	0	42	0	0	328	44	494	84	355	419	113
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	75	-	150	325	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	2	-	-	-2	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	47	0	0	364	49	549	93	394	466	126

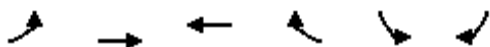
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	466	-	-	549	592	0	0	642	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	-	-	6.22	4.12	-	-	3.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	-	-	3.1	2.218	-	-	3	-	-
Pot Cap-1 Maneuver	0	0	597	0	0	564	984	-	-	773	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	597	-	-	564	984	-	-	773	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.5		22.3		0.6		5.8	
HCM LOS	B		C					

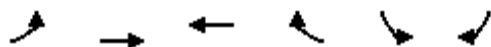
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	984	-	-	597 564	773	-	-
HCM Lane V/C Ratio	0.05	-	-	0.078 0.646	0.51	-	-
HCM Control Delay (s)	8.8	-	-	11.5 22.3	14.4	-	-
HCM Lane LOS	A	-	-	B C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3 4.6	2.9	-	-

Lanes, Volumes, Timings
23: SR 0230 & Norlanco Dr

2033 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	324	440	531	153	185	433
Future Volume (vph)	324	440	531	153	185	433
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (ft)	350			225	175	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1676	1782	1782	1500	1676	1500
Flt Permitted	0.200				0.950	
Satd. Flow (perm)	353	1782	1782	1500	1676	1500
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				170		156
Link Speed (mph)		45	45		25	
Link Distance (ft)		810	2700		500	
Travel Time (s)		12.3	40.9		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	360	489	590	170	206	481
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	1	6	2		8	1
Permitted Phases	6			2		8
Detector Phase	1	6	2	2	8	1
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	13.0
Total Split (s)	20.0	55.0	35.0	35.0	20.0	20.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	C-Max	C-Max	None	None
Act Effct Green (s)	51.3	51.3	32.7	32.7	13.7	32.3
Actuated g/C Ratio	0.68	0.68	0.44	0.44	0.18	0.43
v/c Ratio	0.75	0.40	0.76	0.23	0.68	0.66
Control Delay	19.5	6.6	27.2	3.5	40.1	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	6.6	27.2	3.5	40.1	15.3
LOS	B	A	C	A	D	B
Approach Delay		12.1	21.9		22.8	
Approach LOS		B	C		C	
Queue Length 50th (ft)	63	89	239	0	88	104
Queue Length 95th (ft)	#179	141	#418	34	156	200
Internal Link Dist (ft)		730	2620		420	
Turn Bay Length (ft)	350			225	175	
Base Capacity (vph)	505	1220	777	750	335	759



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
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	0.71	0.40	0.76	0.23	0.61	0.63

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 18.5

Intersection LOS: B

Intersection Capacity Utilization 71.8%

ICU Level of Service C

Analysis Period (min) 15

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

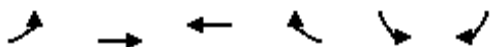
Queue shown is maximum after two cycles.

Splits and Phases: 23: SR 0230 & Norlanco Dr



HCM 6th Signalized Intersection Summary
23: SR 0230 & Norlanco Dr

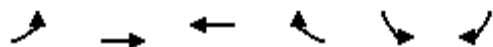
2033 Build
SAT Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	324	440	531	153	185	433
Future Volume (veh/h)	324	440	531	153	185	433
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	1772	1786	1786	1772	1772	1772
Adj Flow Rate, veh/h	360	489	590	170	206	481
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	1	1	2	2	2
Cap, veh/h	468	1191	806	678	338	524
Arrive On Green	0.15	0.67	0.45	0.45	0.20	0.20
Sat Flow, veh/h	1688	1786	1786	1502	1688	1502
Grp Volume(v), veh/h	360	489	590	170	206	481
Grp Sat Flow(s),veh/h/ln	1688	1786	1786	1502	1688	1502
Q Serve(g_s), s	7.6	9.4	20.3	5.3	8.3	15.0
Cycle Q Clear(g_c), s	7.6	9.4	20.3	5.3	8.3	15.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	468	1191	806	678	338	524
V/C Ratio(X)	0.77	0.41	0.73	0.25	0.61	0.92
Avail Cap(c_a), veh/h	554	1191	806	678	338	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	5.7	16.9	12.7	27.3	23.4
Incr Delay (d2), s/veh	5.5	1.0	5.8	0.9	3.2	21.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.0	4.7	13.0	3.0	6.5	16.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.4	6.8	22.7	13.6	30.5	44.8
LnGrp LOS	B	A	C	B	C	D
Approach Vol, veh/h		849	760		687	
Approach Delay, s/veh		11.7	20.6		40.5	
Approach LOS		B	C		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	16.1	38.9			55.0	20.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	14.0	29.0			49.0	14.0
Max Q Clear Time (g_c+l1), s	9.6	22.3			11.4	17.0
Green Ext Time (p_c), s	0.6	1.8			1.9	0.0
Intersection Summary						
HCM 6th Ctrl Delay			23.3			
HCM 6th LOS			C			

Lanes, Volumes, Timings
28: SR 0230 & Western Parcels Access

2033 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	63	749	749	70	167	58
Future Volume (vph)	63	749	749	70	167	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12
Grade (%)		1%	-1%		0%	
Storage Length (ft)	500			500	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1702	1809	1846	1591	1733	0
Flt Permitted	0.950				0.964	
Satd. Flow (perm)	1702	1809	1846	1591	1733	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		1000	940		500	
Travel Time (s)		15.2	14.2		13.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	832	832	78	250	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 65.7% ICU Level of Service C

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	13.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	63	749	749	70	167	58
Future Vol, veh/h	63	749	749	70	167	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	500	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	1	-1	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	1	0	2	2	2
Mvmt Flow	70	832	832	78	186	64
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	910	0	-	0	1804	832
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	972	-
Critical Hdwy	4.5	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	549	-	-	-	~ 77	371
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	405	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	549	-	-	-	~ 67	371
Mov Cap-2 Maneuver	-	-	-	-	217	-
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	405	-
Approach	EB	WB		SB		
HCM Control Delay, s	1	0		109.4		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	549	-	-	-	243	
HCM Lane V/C Ratio	0.128	-	-	-	1.029	
HCM Control Delay (s)	12.5	-	-	-	109.4	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	0.4	-	-	-	10.1	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2033 Build
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	51	34	16	34	85	20	303	7	59	297	57
Future Volume (vph)	63	51	34	16	34	85	20	303	7	59	297	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1671	0	0	1609	0	0	1778	0	0	1848	0
Flt Permitted		0.979			0.994			0.997			0.993	
Satd. Flow (perm)	0	1671	0	0	1609	0	0	1778	0	0	1848	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	154	0	0	141	0	0	344	0	0	429	0
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	60.4%											
Analysis Period (min)	15											
	ICU Level of Service B											

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

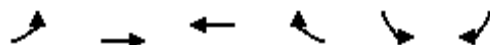
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	63	51	34	16	34	85	20	303	7	59	297	57
Future Vol, veh/h	63	51	34	16	34	85	20	303	7	59	297	57
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	8	4	0	0	3	0	5	2	0	0	2	9
Mvmt Flow	66	53	35	17	35	89	21	316	7	61	309	59
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.8	10.9	14.9	17.3
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	43%	12%	14%
Vol Thru, %	92%	34%	25%	72%
Vol Right, %	2%	23%	63%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	330	148	135	413
LT Vol	20	63	16	59
Through Vol	303	51	34	297
RT Vol	7	34	85	57
Lane Flow Rate	344	154	141	430
Geometry Grp	1	1	1	1
Degree of Util (X)	0.532	0.272	0.233	0.636
Departure Headway (Hd)	5.57	6.343	5.958	5.319
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	643	563	598	675
Service Time	3.64	4.429	4.047	3.384
HCM Lane V/C Ratio	0.535	0.274	0.236	0.637
HCM Control Delay	14.9	11.8	10.9	17.3
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	3.1	1.1	0.9	4.6

Lanes, Volumes, Timings
32: SR 0230 & Ridge Run Rd

2033 Build
SAT Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	583	632	85	79	3
Future Volume (vph)	3	583	632	85	79	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	10	12
Grade (%)		-1%	1%		2%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Satd. Flow (prot)	1754	1828	1783	0	1666	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1754	1828	1783	0	1666	0
Link Speed (mph)		55	55		35	
Link Distance (ft)		2700	1000		1310	
Travel Time (s)		33.5	12.4		25.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	607	747	0	85	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 49.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	583	632	85	79	3
Future Vol, veh/h	3	583	632	85	79	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-1	1	-	2	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	607	658	89	82	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	747	0	-	0	1316	703
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	613	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	688	-	-	-	165	444
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	571	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	688	-	-	-	164	444
Mov Cap-2 Maneuver	-	-	-	-	320	-
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	571	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		20.1		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	688	-	-	-	323	
HCM Lane V/C Ratio	0.005	-	-	-	0.264	
HCM Control Delay (s)	10.3	-	-	-	20.1	
HCM Lane LOS	B	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	1	

Lanes, Volumes, Timings
34: Ridge Run Rd & Site Driveway

2033 Build
SAT Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	46	50	38	36	0
Future Volume (vph)	0	46	50	38	36	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12
Grade (%)	0%			-3%	3%	
Satd. Flow (prot)	1611	0	0	1730	1747	0
Flt Permitted				0.972		
Satd. Flow (perm)	1611	0	0	1730	1747	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			1310	976	
Travel Time (s)	15.6			25.5	19.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	51	0	0	98	40	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.4%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	46	50	38	36	0
Future Vol, veh/h	0	46	50	38	36	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-3	3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	2
Mvmt Flow	0	51	56	42	40	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	194	40	40	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	154	-	-	-	-	-
Critical Hdwy	6.42	6.22	3.7	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	920	1103	1171	-	-	-
Stage 1	1149	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	875	1103	1171	-	-	-
Mov Cap-2 Maneuver	875	-	-	-	-	-
Stage 1	1093	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	4.7		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1171	-	1103	-	-	
HCM Lane V/C Ratio	0.047	-	0.046	-	-	
HCM Control Delay (s)	8.2	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

APPENDIX L19

2033 BUILD WITH IMPROVEMENTS CONDITION ANALYSES

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build w/ Improvements
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	487	82	107	453	150	164
Future Volume (vph)	487	82	107	453	150	164
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		100	150		0	150
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Satd. Flow (prot)	1726	1339	1662	1766	1605	1515
Flt Permitted			0.273		0.950	
Satd. Flow (perm)	1726	1339	477	1766	1605	1479
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		72				
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	12%	6%	12%	4%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	541	91	119	503	167	182
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases	2	2	6		4	4
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	5.0
Minimum Split (s)	25.2	25.2	12.0	22.2	15.0	15.0
Total Split (s)	34.0	34.0	12.0	46.0	24.0	24.0
Total Split (%)	48.6%	48.6%	17.1%	65.7%	34.3%	34.3%
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2	4.2
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	0.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.2	6.2	4.0	5.2	5.2	6.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	33.5	32.5	44.3	43.1	16.5	15.5
Actuated g/C Ratio	0.48	0.46	0.63	0.62	0.24	0.22
v/c Ratio	0.65	0.14	0.28	0.46	0.44	0.55
Control Delay	21.0	5.8	5.4	6.6	26.2	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	5.8	5.4	6.6	26.2	30.6
LOS	C	A	A	A	C	C
Approach Delay	18.8			6.4	28.5	
Approach LOS	B			A	C	
Queue Length 50th (ft)	186	5	15	69	60	69
Queue Length 95th (ft)	#348	31	27	104	110	124

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build w/ Improvements
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)		100	150			150
Base Capacity (vph)	826	660	437	1086	431	376
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	0.65	0.14	0.27	0.46	0.39	0.48

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 61 (87%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 16.1

Intersection LOS: B

Intersection Capacity Utilization 54.1%

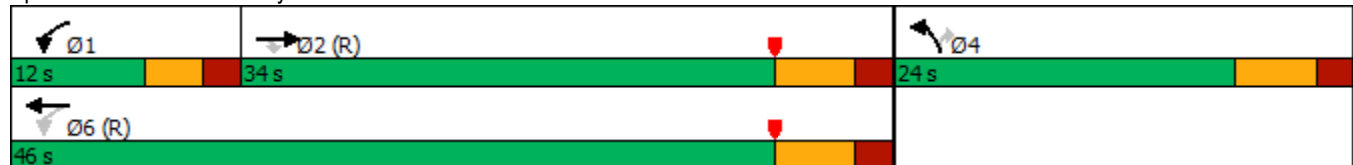
ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 Build w/ Improvements
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	487	82	107	453	150	164
Future Volume (veh/h)	487	82	107	453	150	164
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	1648	1542	1938	1927	1818	1846
Adj Flow Rate, veh/h	541	85	119	503	167	182
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	12	6	12	4	2
Cap, veh/h	882	681	503	1293	313	260
Arrive On Green	0.54	0.52	0.16	1.00	0.18	0.17
Sat Flow, veh/h	1648	1307	1846	1927	1731	1564
Grp Volume(v), veh/h	541	85	119	503	167	182
Grp Sat Flow(s),veh/h/ln	1648	1307	1846	1927	1731	1564
Q Serve(g_s), s	15.9	2.3	1.7	0.0	6.1	7.7
Cycle Q Clear(g_c), s	15.9	2.3	1.7	0.0	6.1	7.7
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	882	681	503	1293	313	260
V/C Ratio(X)	0.61	0.12	0.24	0.39	0.53	0.70
Avail Cap(c_a), veh/h	882	681	569	1293	465	398
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	8.6	6.8	0.0	26.0	27.5
Incr Delay (d2), s/veh	3.2	0.4	0.2	0.9	5.1	11.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.4	1.1	0.8	0.6	5.1	6.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.4	9.0	7.0	0.9	31.1	39.2
LnGrp LOS	B	A	A	A	C	D
Approach Vol, veh/h	626			622	349	
Approach Delay, s/veh	13.7			2.1	35.3	
Approach LOS	B			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.5	42.7		17.8		52.2
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	7.0	27.8		17.8		39.8
Max Q Clear Time (g_c+I1), s	3.7	17.9		9.7		2.0
Green Ext Time (p_c), s	0.1	6.3		2.0		13.7
Intersection Summary						
HCM 6th Ctrl Delay			13.9			
HCM 6th LOS			B			

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build w/ Improvements
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	841	90	244	660	129	177
Future Volume (vph)	841	90	244	660	129	177
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		100	150		0	150
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Satd. Flow (prot)	1827	1499	1744	1958	1653	1530
Flt Permitted			0.088		0.950	
Satd. Flow (perm)	1827	1468	162	1958	1653	1530
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		48				
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	924	99	268	725	142	195
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases	2	2	6		4	4
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	5.0
Minimum Split (s)	25.2	25.2	12.0	22.2	15.0	15.0
Total Split (s)	46.0	46.0	13.0	59.0	21.0	21.0
Total Split (%)	57.5%	57.5%	16.3%	73.8%	26.3%	26.3%
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2	4.2
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	0.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.2	6.2	4.0	5.2	5.2	6.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	41.2	40.2	55.4	54.2	15.4	14.4
Actuated g/C Ratio	0.52	0.50	0.69	0.68	0.19	0.18
v/c Ratio	0.98	0.13	0.92	0.55	0.45	0.71
Control Delay	46.8	6.7	44.8	6.8	33.5	46.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	6.7	44.8	6.8	33.5	46.5
LOS	D	A	D	A	C	D
Approach Delay	42.9			17.0	41.0	
Approach LOS	D			B	D	
Queue Length 50th (ft)	432	13	77	142	63	92
Queue Length 95th (ft)	#705	37	m#99	m159	117	#182

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build w/ Improvements
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	920			1120	920	
Turn Bay Length (ft)		100	150			150
Base Capacity (vph)	941	761	290	1326	326	283
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	0.98	0.13	0.92	0.55	0.44	0.69

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 5 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 31.7

Intersection LOS: C

Intersection Capacity Utilization 80.5%

ICU Level of Service D

Analysis Period (min) 15

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.

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 Build w/ Improvements
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	841	90	244	660	129	177
Future Volume (veh/h)	841	90	244	660	129	177
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	1735	1711	2009	2090	1860	1860
Adj Flow Rate, veh/h	924	90	268	725	142	195
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	0	1	1	1	1
Cap, veh/h	937	764	315	1467	297	245
Arrive On Green	0.54	0.53	0.22	1.00	0.17	0.16
Sat Flow, veh/h	1735	1448	1914	2090	1772	1577
Grp Volume(v), veh/h	924	90	268	725	142	195
Grp Sat Flow(s),veh/h/ln	1735	1448	1914	2090	1772	1577
Q Serve(g_s), s	41.9	2.5	6.3	0.0	5.8	9.5
Cycle Q Clear(g_c), s	41.9	2.5	6.3	0.0	5.8	9.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	937	764	315	1467	297	245
V/C Ratio(X)	0.99	0.12	0.85	0.49	0.48	0.80
Avail Cap(c_a), veh/h	937	764	315	1467	350	292
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	9.5	19.2	0.0	30.1	32.6
Incr Delay (d2), s/veh	26.3	0.3	19.6	1.2	4.3	20.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	28.5	1.4	9.8	0.9	4.9	8.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	44.5	9.8	38.8	1.2	34.4	52.8
LnGrp LOS	D	A	D	A	C	D
Approach Vol, veh/h	1014			993	337	
Approach Delay, s/veh	41.4			11.3	45.0	
Approach LOS	D			B	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	13.0	48.4		18.6		61.4
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	39.8		14.8		52.8
Max Q Clear Time (g_c+I1), s	8.3	43.9		11.5		2.0
Green Ext Time (p_c), s	0.0	0.0		0.9		25.3
Intersection Summary						
HCM 6th Ctrl Delay			29.2			
HCM 6th LOS			C			

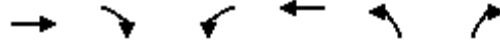
Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build w/ Improvements
SAT Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↖	↗
Traffic Volume (vph)	810	87	181	703	93	179
Future Volume (vph)	810	87	181	703	93	179
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	12	12	14	11	12
Grade (%)	4%			-6%	-2%	
Storage Length (ft)		100	150		0	150
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Satd. Flow (prot)	1863	1499	1761	1958	1670	1530
Flt Permitted			0.220		0.950	
Satd. Flow (perm)	1863	1499	408	1958	1670	1530
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		30				
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			1200	1000	
Travel Time (s)	19.5			23.4	19.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	818	88	183	710	94	181
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	4	1
Permitted Phases	2	2	6		4	4
Detector Phase	2	2	1	6	4	1
Switch Phase						
Minimum Initial (s)	15.0	15.0	5.0	15.0	5.0	5.0
Minimum Split (s)	25.2	25.2	12.0	22.2	15.0	12.0
Total Split (s)	52.0	52.0	13.0	65.0	45.0	13.0
Total Split (%)	47.3%	47.3%	11.8%	59.1%	40.9%	11.8%
Yellow Time (s)	4.2	4.2	3.0	4.2	4.2	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	0.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	5.2	6.2	4.0	5.2	5.2	5.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effect Green (s)	74.3	73.3	88.5	88.3	15.6	25.5
Actuated g/C Ratio	0.68	0.67	0.80	0.80	0.14	0.23
v/c Ratio	0.65	0.09	0.42	0.45	0.40	0.51
Control Delay	15.4	6.1	5.0	6.2	47.1	40.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	6.1	5.0	6.2	47.1	40.1
LOS	B	A	A	A	D	D
Approach Delay	14.5			5.9	42.5	
Approach LOS	B			A	D	
Queue Length 50th (ft)	335	14	22	154	61	107
Queue Length 95th (ft)	538	38	m47	m321	108	166
Internal Link Dist (ft)	920			1120	920	

Lanes, Volumes, Timings
3: Maytown Rd & SR 0230

2033 Build w/ Improvements
SAT Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)		100	150			150
Base Capacity (vph)	1257	1008	438	1572	604	355
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	0.65	0.09	0.42	0.45	0.16	0.51

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 97 (88%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 14.5

Intersection LOS: B

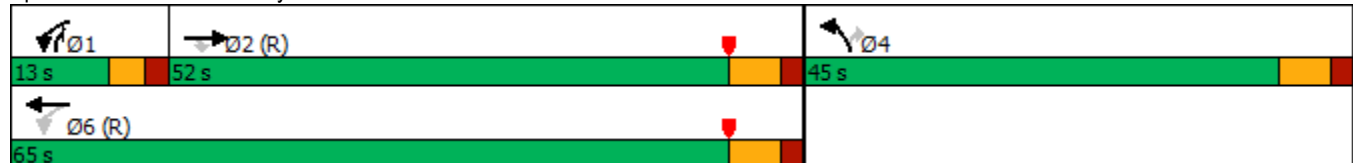
Intersection Capacity Utilization 73.0%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 3: Maytown Rd & SR 0230



HCM 6th Signalized Intersection Summary

3: Maytown Rd & SR 0230

2033 Build w/ Improvements
SAT Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	810	87	181	703	93	179
Future Volume (veh/h)	810	87	181	703	93	179
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	1765	1711	2024	2090	1875	1860
Adj Flow Rate, veh/h	818	86	183	710	94	181
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	1	0	1
Cap, veh/h	1155	936	413	1563	281	309
Arrive On Green	0.65	0.65	0.08	1.00	0.16	0.15
Sat Flow, veh/h	1765	1450	1927	2090	1785	1577
Grp Volume(v), veh/h	818	86	183	710	94	181
Grp Sat Flow(s),veh/h/ln	1765	1450	1927	2090	1785	1577
Q Serve(g_s), s	32.8	2.5	3.2	0.3	5.2	11.5
Cycle Q Clear(g_c), s	32.8	2.5	3.2	0.3	5.2	11.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1155	936	413	1563	281	309
V/C Ratio(X)	0.71	0.09	0.44	0.45	0.33	0.59
Avail Cap(c_a), veh/h	1155	936	461	1563	646	632
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	7.3	11.7	0.1	41.2	40.1
Incr Delay (d2), s/veh	3.7	0.2	0.7	1.0	2.5	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	18.3	1.4	3.1	0.9	4.4	15.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.9	7.5	12.5	1.0	43.7	46.4
LnGrp LOS	B	A	B	A	D	D
Approach Vol, veh/h	904			893	275	
Approach Delay, s/veh	15.1			3.4	45.5	
Approach LOS	B			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.3	77.2		22.5		87.5
Change Period (Y+Rc), s	5.0	6.2		6.2		6.2
Max Green Setting (Gmax), s	8.0	45.8		38.8		58.8
Max Q Clear Time (g_c+I1), s	5.2	34.8		13.5		2.3
Green Ext Time (p_c), s	0.1	9.1		2.8		25.9
Intersection Summary						
HCM 6th Ctrl Delay			14.1			
HCM 6th LOS			B			

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	314	282	56	48	265	218	89	397	47	124	238	196
Future Volume (vph)	314	282	56	48	265	218	89	397	47	124	238	196
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1485	3153	1113	1194	3133	1561	1637	1689	0	1500	1509	1388
Flt Permitted	0.413			0.569			0.530			0.204		
Satd. Flow (perm)	646	3153	1088	714	3133	1561	914	1689	0	322	1509	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			239		7				232
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1026				640
Travel Time (s)		14.2			7.4			28.0				10.9
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	9%	29%	33%	5%	4%	6%	13%	18%	8%	13%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	334	300	60	51	282	232	95	472	0	132	253	209
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	15.0	38.5	38.5	23.5	23.5	23.5	14.0	27.5		14.0	27.5	27.5
Total Split (%)	18.8%	48.1%	48.1%	29.4%	29.4%	29.4%	17.5%	34.4%		17.5%	34.4%	34.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	28.8	28.8	28.8	13.7	13.7	13.7	27.8	21.7		27.8	21.7	21.7
Actuated g/C Ratio	0.40	0.40	0.40	0.19	0.19	0.19	0.38	0.30		0.38	0.30	0.30
v/c Ratio	0.92	0.24	0.12	0.38	0.48	0.48	0.22	0.93		0.53	0.56	0.36
Control Delay	53.2	16.2	0.4	36.6	30.4	7.4	13.3	54.6		20.6	28.9	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	53.2	16.2	0.4	36.6	30.4	7.4	13.3	54.6		20.6	28.9	4.6
LOS	D	B	A	D	C	A	B	D		C	C	A
Approach Delay		32.6			21.5			47.6			18.5	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	123	50	0	21	63	0	23	213		34	100	0
Queue Length 95th (ft)	#294	77	0	55	100	52	53	#423		71	184	38

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	860			410			946			560		
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	365	1440	578	177	780	568	429	507		253	448	576
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.92	0.21	0.10	0.29	0.36	0.41	0.22	0.93		0.52	0.56	0.36

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 30.1

Intersection LOS: C

Intersection Capacity Utilization 79.9%

ICU Level of Service D

Analysis Period (min) 15

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

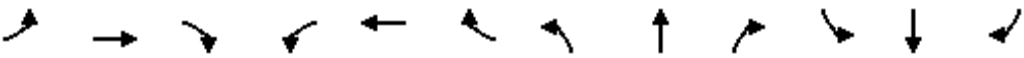
Queue shown is maximum after two cycles.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15 s	23.5 s	14 s	27.5 s
 Ø6		 Ø7	 Ø8
38.5 s		14 s	27.5 s

HCM 6th Signalized Intersection Summary 17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	282	56	48	265	218	89	397	47	124	238	196
Future Volume (veh/h)	314	282	56	48	265	218	89	397	47	124	238	196
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			
Adj Sat Flow, veh/h/ln	1724	1709	1425	1331	1724	1808	2087	2067	1917	1598	1528	1598
Adj Flow Rate, veh/h	334	300	47	51	282	0	95	422	48	132	253	179
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	9	29	33	5	4	6	13	18	8	13	8
Cap, veh/h	429	1258	467	232	591		414	492	56	299	458	405
Arrive On Green	0.13	0.39	0.39	0.36	0.36	0.00	0.07	0.27	0.26	0.10	0.30	0.30
Sat Flow, veh/h	1641	3248	1206	734	3276	1532	1988	1822	207	1522	1528	1352
Grp Volume(v), veh/h	334	300	47	51	282	0	95	0	470	132	253	179
Grp Sat Flow(s),veh/h/ln	1641	1624	1206	734	1638	1532	1988	0	2029	1522	1528	1352
Q Serve(g_s), s	9.5	4.5	1.8	3.7	4.8	0.0	2.4	0.0	16.0	4.3	10.1	7.7
Cycle Q Clear(g_c), s	9.5	4.5	1.8	3.7	4.8	0.0	2.4	0.0	16.0	4.3	10.1	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	429	1258	467	232	591		414	0	548	299	458	405
V/C Ratio(X)	0.78	0.24	0.10	0.22	0.48		0.23	0.00	0.86	0.44	0.55	0.44
Avail Cap(c_a), veh/h	429	1478	549	282	813		490	0	602	312	458	405
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	15.0	14.2	20.2	20.5	0.0	17.0	0.0	25.2	17.7	21.3	20.5
Incr Delay (d2), s/veh	8.8	0.0	0.0	0.2	0.2	0.0	0.3	0.0	11.1	1.0	1.4	0.8
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(95%),veh/ln	8.8	2.6	0.8	1.0	2.8	0.0	2.0	0.0	14.0	2.6	6.2	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	15.0	14.2	20.4	20.8	0.0	17.2	0.0	36.3	18.7	22.8	21.3
LnGrp LOS	C	B	B	C	C		B	A	D	B	C	C
Approach Vol, veh/h	681				333				565			
Approach Delay, s/veh	22.6				20.7				33.1			
Approach LOS	C				C				C			
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	18.6	13.4	25.6		33.6	11.2	27.7				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	8.5	17.0	7.0	20.5		32.0	7.0	20.5				
Max Q Clear Time (g_c+I1), s	12.0	7.3	6.8	18.0		7.0	4.9	12.6				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.6		0.2	0.1	1.4				

Intersection Summary

HCM 6th Ctrl Delay 24.7
HCM 6th LOS C

Notes

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

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	333	442	82	176	567	159	123	341	96	245	345	242
Future Volume (vph)	333	442	82	176	567	159	123	341	96	245	345	242
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1588	3403	1435	1512	3225	1577	1522	1769	0	1604	1640	1442
Flt Permitted	0.213			0.489			0.386			0.113		
Satd. Flow (perm)	356	3403	1435	778	3225	1577	619	1769	0	191	1640	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			159		11				249
Link Speed (mph)		45			45			25			40	
Link Distance (ft)		940			490			1028			640	
Travel Time (s)		14.2			7.4			28.0			10.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	5%	2%	3%	14%	7%	6%	1%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	343	456	85	181	585	164	127	451	0	253	356	249
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	23.0		14.0	23.0	23.0
Total Split (s)	26.0	68.0	68.0	42.0	42.0	42.0	15.0	32.0		20.0	37.0	37.0
Total Split (%)	21.7%	56.7%	56.7%	35.0%	35.0%	35.0%	12.5%	26.7%		16.7%	30.8%	30.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	C-Max		None	C-Max	C-Max
Act Effect Green (s)	56.7	56.7	56.7	30.8	30.8	30.8	40.6	31.8		50.9	36.9	36.9
Actuated g/C Ratio	0.47	0.47	0.47	0.26	0.26	0.26	0.34	0.26		0.42	0.31	0.31
v/c Ratio	0.91	0.28	0.12	0.91	0.71	0.31	0.46	0.95		1.03	0.71	0.40
Control Delay	51.9	19.1	2.4	82.9	46.5	11.8	30.4	74.1		78.5	36.2	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	51.9	19.1	2.4	82.9	46.5	11.8	30.4	74.1		78.5	36.2	6.5
LOS	D	B	A	F	D	B	C	E		E	D	A
Approach Delay		30.2			47.4			64.5			40.0	
Approach LOS		C			D			E			D	
Queue Length 50th (ft)	165	104	0	144	221	22	63	~370		~174	227	27
Queue Length 95th (ft)	#319	132	19	m#244	265	m65	113	#614		m#183	m243	m28
Internal Link Dist (ft)		860			410			948			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	378	1772	795	236	980	590	278	476		245	504	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.91	0.26	0.11	0.77	0.60	0.28	0.46	0.95		1.03	0.71	0.40

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 43.8

Intersection LOS: D

Intersection Capacity Utilization 94.6%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

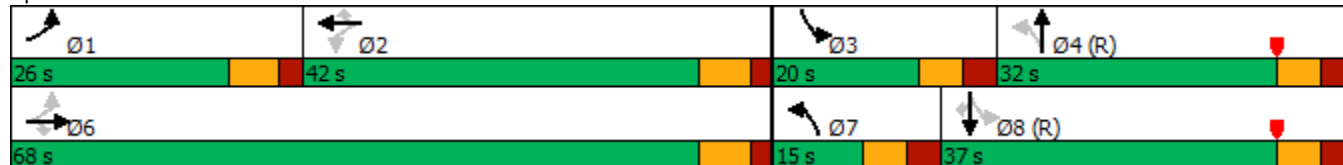
Queue shown is maximum after two cycles.

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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230



HCM 6th Signalized Intersection Summary 17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	333	442	82	176	567	159	123	341	96	245	345	242
Future Volume (veh/h)	333	442	82	176	567	159	123	341	96	245	345	242
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	1823	1823	1837	1724	1766	1822	1974	2156	2087	1697	1655	1655
Adj Flow Rate, veh/h	343	456	55	181	585	0	127	352	98	253	356	178
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	0	5	2	3	14	7	6	1	4	4
Cap, veh/h	381	1423	640	219	652		396	530	148	371	614	521
Arrive On Green	0.17	0.41	0.41	0.39	0.39	0.00	0.07	0.33	0.32	0.16	0.49	0.49
Sat Flow, veh/h	1736	3464	1557	820	3356	1544	1880	1623	452	1616	1655	1402
Grp Volume(v), veh/h	343	456	55	181	585	0	127	0	450	253	356	178
Grp Sat Flow(s),veh/h/ln	1736	1732	1557	820	1678	1544	1880	0	2075	1616	1655	1402
Q Serve(g_s), s	18.1	10.7	2.6	23.3	19.6	0.0	5.2	0.0	22.4	12.3	18.3	9.3
Cycle Q Clear(g_c), s	18.1	10.7	2.6	23.3	19.6	0.0	5.2	0.0	22.4	12.3	18.3	9.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	381	1423	640	219	652		396	0	678	371	614	521
V/C Ratio(X)	0.90	0.32	0.09	0.83	0.90		0.32	0.00	0.66	0.68	0.58	0.34
Avail Cap(c_a), veh/h	381	1804	811	309	1021		402	0	678	371	614	521
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)	1.00	1.00	1.00	1.00	1.00	0.00	0.84	0.00	0.84	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	24.0	21.6	38.1	35.6	0.0	24.1	0.0	34.8	23.1	23.7	21.4
Incr Delay (d2), s/veh	23.4	0.0	0.0	8.3	4.7	0.0	0.4	0.0	4.3	5.0	4.0	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(95%),veh/ln	14.8	7.6	1.7	8.4	10.5	0.0	4.3	0.0	17.5	8.2	11.2	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.3	24.0	21.6	46.4	40.3	0.0	24.5	0.0	39.1	28.1	27.7	23.2
LnGrp LOS	D	C	C	D	D		C	A	D	C	C	C
Approach Vol, veh/h	854			766			577			787		
Approach Delay, s/veh	36.0			41.7			35.9			26.8		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	26.0	28.8	20.0	45.2		54.8	14.6	50.6				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	19.5	35.5	13.0	25.0		61.5	8.0	30.0				
Max Q Clear Time (g_c+I1), s	20.6	22.1	14.8	24.4		13.2	7.7	20.8				
Green Ext Time (p_c), s	0.0	0.2	0.0	0.2		0.3	0.0	2.0				

Intersection Summary

HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

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

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	486	76	191	571	155	94	212	133	144	166	155
Future Volume (vph)	355	486	76	191	571	155	94	212	133	144	166	155
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	12	10	10	11	14	11	13	12	11	11	12
Grade (%)		-1%			1%			-10%			4%	
Storage Length (ft)	275		250	150		125	100		0	325		400
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1573	3437	1435	1527	3289	1592	1736	1785	0	1558	1624	1499
Flt Permitted	0.219			0.470			0.650			0.252		
Satd. Flow (perm)	363	3437	1435	755	3289	1592	1188	1785	0	413	1624	1499
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			160			255		38				247
Link Speed (mph)		45			45			25				40
Link Distance (ft)		940			490			1025				640
Travel Time (s)		14.2			7.4			28.0				10.9
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	0%	0%	4%	0%	2%	0%	5%	0%	4%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	362	496	78	195	583	158	96	352	0	147	169	158
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6			2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	12.0	12.0	12.0	12.0	12.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	13.5	23.5	23.5	23.5	23.5	23.5	14.0	20.0		14.0	20.0	20.0
Total Split (s)	15.5	39.5	39.5	24.0	24.0	24.0	14.0	21.5		14.0	21.5	21.5
Total Split (%)	20.7%	52.7%	52.7%	32.0%	32.0%	32.0%	18.7%	28.7%		18.7%	28.7%	28.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Min	Min	Min	Min	Min	None	None		None	None	None
Act Effect Green (s)	34.0	34.0	34.0	18.5	18.5	18.5	23.0	15.3		24.4	18.0	18.0
Actuated g/C Ratio	0.46	0.46	0.46	0.25	0.25	0.25	0.31	0.20		0.33	0.24	0.24
v/c Ratio	1.11	0.32	0.11	1.04	0.72	0.27	0.23	0.89		0.57	0.43	0.29
Control Delay	103.1	13.7	0.3	110.6	31.5	1.5	16.5	52.8		25.7	29.9	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	103.1	13.7	0.3	110.6	31.5	1.5	16.5	52.8		25.7	29.9	2.0
LOS	F	B	A	F	C	A	B	D		C	C	A
Approach Delay		47.2			42.9			45.0			19.3	
Approach LOS		D			D			D			B	
Queue Length 50th (ft)	~136	74	0	~101	130	0	28	143		45	70	0
Queue Length 95th (ft)	#298	107	0	#223	186	6	57	#293		#88	128	9
Internal Link Dist (ft)		860			410			945			560	

Lanes, Volumes, Timings
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	275		250	150		125	100			325		400
Base Capacity (vph)	326	1564	740	187	814	585	428	400		257	392	549
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.11	0.32	0.11	1.04	0.72	0.27	0.22	0.88		0.57	0.43	0.29

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 74.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 40.7

Intersection LOS: D

Intersection Capacity Utilization 85.4%

ICU Level of Service E

Analysis Period (min) 15

~ 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.

Splits and Phases: 17: Colebrook Rd/Cloverleaf Rd & SR 0230

 Ø1	 Ø2	 Ø3	 Ø4
15.5 s	24 s	14 s	21.5 s
 Ø6	 Ø7	 Ø8	
39.5 s	14 s	21.5 s	

HCM 6th Signalized Intersection Summary
17: Colebrook Rd/Cloverleaf Rd & SR 0230

2033 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	355	486	76	191	571	155	94	212	133	144	166	155
Future Volume (veh/h)	355	486	76	191	571	155	94	212	133	144	166	155
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	1809	1837	1837	1738	1794	1837	2173	2186	2173	1655	1641	1711
Adj Flow Rate, veh/h	362	496	72	195	583	0	96	216	133	147	169	76
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	4	0	2	0	5	0	4	5	0
Cap, veh/h	391	1491	665	264	700		470	264	163	331	407	359
Arrive On Green	0.14	0.43	0.43	0.41	0.41	0.00	0.07	0.21	0.19	0.11	0.25	0.25
Sat Flow, veh/h	1723	3491	1557	784	3409	1557	2069	1266	779	1576	1641	1450
Grp Volume(v), veh/h	362	496	72	195	583	0	96	0	349	147	169	76
Grp Sat Flow(s),veh/h/ln	1723	1745	1557	784	1705	1557	2069	0	2045	1576	1641	1450
Q Serve(g_s), s	10.0	6.6	1.9	14.3	10.7	0.0	2.4	0.0	11.4	4.9	6.0	2.9
Cycle Q Clear(g_c), s	10.0	6.6	1.9	14.3	10.7	0.0	2.4	0.0	11.4	4.9	6.0	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.38	1.00		1.00
Lane Grp Cap(c), veh/h	391	1491	665	264	700		470	0	427	331	407	359
V/C Ratio(X)	0.92	0.33	0.11	0.74	0.83		0.20	0.00	0.82	0.44	0.42	0.21
Avail Cap(c_a), veh/h	391	1698	758	311	903		553	0	454	332	407	359
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(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	13.4	12.0	21.9	19.5	0.0	18.9	0.0	26.6	18.7	22.0	20.9
Incr Delay (d2), s/veh	27.5	0.0	0.0	5.8	4.2	0.0	0.2	0.0	10.6	0.9	0.7	0.3
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(95%),veh/ln	11.1	4.0	1.1	4.5	6.0	0.0	2.1	0.0	10.9	3.0	4.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.4	13.4	12.1	27.7	23.8	0.0	19.1	0.0	37.2	19.6	22.7	21.1
LnGrp LOS	D	B	B	C	C		B	A	D	B	C	C
Approach Vol, veh/h	930			778			445			392		
Approach Delay, s/veh	26.5			24.7			33.3			21.3		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.5	19.8	13.9	20.6		35.3	11.2	23.3				
Change Period (Y+Rc), s	6.5	6.5	7.0	7.0		6.5	7.0	7.0				
Max Green Setting (Gmax), s	9.0	17.5	7.0	14.5		33.0	7.0	14.5				
Max Q Clear Time (g_c+I1), s	12.5	13.2	7.4	13.4		9.1	4.9	8.5				
Green Ext Time (p_c), s	0.0	0.1	0.0	0.2		0.3	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay	26.4
HCM 6th LOS	C

Notes

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

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	23	35	6	45	127	48	365	10	34	225	81
Future Volume (vph)	73	23	35	6	45	127	48	365	10	34	225	81
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1231	0	0	1456	0	0	1578	0	0	1446	0
Flt Permitted		0.791			0.986			0.929			0.934	
Satd. Flow (perm)	0	1001	0	0	1438	0	0	1475	0	0	1358	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		30			132			3			42	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1157			1404			999			1026	
Travel Time (s)		22.5			27.4			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	185	0	0	440	0	0	353	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	22.0	22.0		22.0	22.0		38.0	38.0		38.0	38.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		11.1			11.1			23.9			23.9	
Actuated g/C Ratio		0.27			0.27			0.58			0.58	
v/c Ratio		0.46			0.38			0.51			0.44	
Control Delay		17.5			8.2			10.5			8.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.5			8.2			10.5			8.8	
LOS		B			A			B			A	
Approach Delay		17.5			8.2			10.5			8.8	
Approach LOS		B			A			B			A	
Queue Length 50th (ft)		18			8			64			41	
Queue Length 95th (ft)		74			55			164			116	
Internal Link Dist (ft)		1077			1324			919			946	
Turn Bay Length (ft)												
Base Capacity (vph)		460			711			1221			1131	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.30			0.26			0.36			0.31	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 40.9

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 10.4

Intersection LOS: B

Intersection Capacity Utilization 63.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
38 s	22 s
 Ø6	 Ø8
38 s	22 s

HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	23	35	6	45	127	48	365	10	34	225	81
Future Volume (veh/h)	73	23	35	6	45	127	48	365	10	34	225	81
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	76	24	36	6	47	132	50	380	10	35	234	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	369	91	91	143	92	242	189	598	15	180	483	161
Arrive On Green	0.18	0.22	0.18	0.18	0.22	0.18	0.37	0.41	0.37	0.37	0.41	0.37
Sat Flow, veh/h	727	411	410	25	413	1092	100	1463	36	81	1181	394
Grp Volume(v), veh/h	136	0	0	185	0	0	440	0	0	353	0	0
Grp Sat Flow(s),veh/h/ln	1548	0	0	1531	0	0	1600	0	0	1656	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.6	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.9	0.0	0.0	3.0	0.0	0.0	6.1	0.0	0.0	4.4	0.0	0.0
Prop In Lane	0.56		0.26	0.03		0.71	0.11		0.02	0.10		0.24
Lane Grp Cap(c), veh/h	493	0	0	420	0	0	743	0	0	762	0	0
V/C Ratio(X)	0.28	0.00	0.00	0.44	0.00	0.00	0.59	0.00	0.00	0.46	0.00	0.00
Avail Cap(c_a), veh/h	1023	0	0	1039	0	0	1994	0	0	2034	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(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.3	0.0	0.0	9.7	0.0	0.0	6.6	0.0	0.0	6.1	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.0	0.0	0.8	0.0	0.0	0.4	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(95%),veh/ln	0.9	0.0	0.0	1.3	0.0	0.0	2.5	0.0	0.0	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	0.0	0.0	10.4	0.0	0.0	7.3	0.0	0.0	6.6	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		136			185			440			353	
Approach Delay, s/veh		9.6			10.4			7.3			6.6	
Approach LOS		A			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		16.1		11.0		16.1		11.0				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		32.0		16.0		32.0		16.0				
Max Q Clear Time (g_c+I1), s		8.1		3.9		6.4		5.0				
Green Ext Time (p_c), s		1.9		0.4		1.6		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				7.9								
HCM 6th LOS				A								

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	85	80	4	53	82	34	382	6	114	435	66
Future Volume (vph)	96	85	80	4	53	82	34	382	6	114	435	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1310	0	0	1477	0	0	1586	0	0	1489	0
Flt Permitted		0.845			0.988			0.928			0.844	
Satd. Flow (perm)	0	1127	0	0	1461	0	0	1477	0	0	1268	0
Right Turn on Red		Yes				Yes				Yes		Yes
Satd. Flow (RTOR)		35			85			2			17	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1146			1234			997			1028	
Travel Time (s)		22.3			24.0			27.2			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	48%	5%	21%	0%	7%	4%	16%	8%	0%	32%	15%	41%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	272	0	0	144	0	0	439	0	0	641	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		14.7			14.7			33.0			33.0	
Actuated g/C Ratio		0.25			0.25			0.57			0.57	
v/c Ratio		0.87			0.33			0.52			0.88	
Control Delay		49.4			11.3			10.2			26.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		49.4			11.3			10.2			26.8	
LOS		D			B			B			C	
Approach Delay		49.4			11.3			10.2			26.8	
Approach LOS		D			B			B			C	
Queue Length 50th (ft)		83			17			82			165	
Queue Length 95th (ft)		#211			56			146			#385	
Internal Link Dist (ft)		1066			1154			917			948	
Turn Bay Length (ft)												
Base Capacity (vph)		319			443			898			777	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
33: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.85			0.33			0.49			0.82	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 57.7

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 24.5

Intersection LOS: C

Intersection Capacity Utilization 99.3%

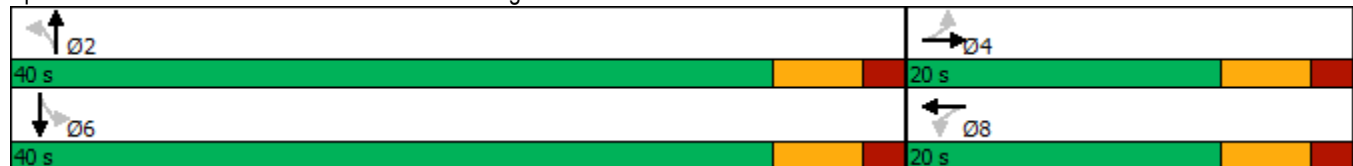
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Colebrook Rd & Harrisburg Ave



HCM 6th Signalized Intersection Summary

33: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	85	80	4	53	82	34	382	6	114	435	66
Future Volume (veh/h)	96	85	80	4	53	82	34	382	6	114	435	66
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	1155	1766	1539	1837	1738	1780	1570	1682	1794	1531	1773	1403
Adj Flow Rate, veh/h	100	89	83	4	55	85	35	398	6	119	453	69
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	48	5	21	0	7	4	16	8	0	32	15	41
Cap, veh/h	237	152	116	97	158	232	129	773	11	214	599	85
Arrive On Green	0.22	0.25	0.22	0.22	0.25	0.22	0.47	0.50	0.47	0.47	0.50	0.47
Sat Flow, veh/h	451	607	465	15	631	930	62	1555	22	213	1206	171
Grp Volume(v), veh/h	272	0	0	144	0	0	439	0	0	641	0	0
Grp Sat Flow(s),veh/h/ln	1522	0	0	1576	0	0	1639	0	0	1590	0	0
Q Serve(g_s), s	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0	0.0
Cycle Q Clear(g_c), s	6.5	0.0	0.0	3.1	0.0	0.0	7.2	0.0	0.0	13.4	0.0	0.0
Prop In Lane	0.37		0.31	0.03		0.59	0.08		0.01	0.19		0.11
Lane Grp Cap(c), veh/h	466	0	0	448	0	0	872	0	0	858	0	0
V/C Ratio(X)	0.58	0.00	0.00	0.32	0.00	0.00	0.50	0.00	0.00	0.75	0.00	0.00
Avail Cap(c_a), veh/h	651	0	0	648	0	0	1470	0	0	1438	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.7	0.0	0.0	12.5	0.0	0.0	6.8	0.0	0.0	8.3	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.4	0.0	0.0	0.5	0.0	0.0	1.3	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(95%),veh/ln	3.5	0.0	0.0	1.7	0.0	0.0	3.6	0.0	0.0	6.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.9	0.0	0.0	12.9	0.0	0.0	7.3	0.0	0.0	9.6	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		272			144			439			641	
Approach Delay, s/veh		14.9			12.9			7.3			9.6	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		24.6		14.9		24.6		14.9				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		34.0		14.0		34.0		14.0				
Max Q Clear Time (g_c+I1), s		9.2		8.5		15.4		5.1				
Green Ext Time (p_c), s		2.0		0.5		3.2		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				10.2								
HCM 6th LOS				B								

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	51	34	16	34	85	20	303	7	59	297	57
Future Volume (vph)	63	51	34	16	34	85	20	303	7	59	297	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	12	12	10	12	12	11	12	12	12	12
Grade (%)		-1%			-1%			1%			-5%	
Satd. Flow (prot)	0	1583	0	0	1524	0	0	1685	0	0	1750	0
Flt Permitted		0.814			0.937			0.963			0.908	
Satd. Flow (perm)	0	1316	0	0	1437	0	0	1627	0	0	1601	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			89			3			22	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			1132			1000			1025	
Travel Time (s)		19.7			22.1			27.3			28.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	4%	0%	0%	3%	0%	5%	2%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	154	0	0	141	0	0	344	0	0	429	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		20.0	20.0		20.0	20.0	
Total Split (s)	21.0	21.0		21.0	21.0		39.0	39.0		39.0	39.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)		10.3			10.3			21.5			21.5	
Actuated g/C Ratio		0.27			0.27			0.57			0.57	
v/c Ratio		0.41			0.31			0.37			0.47	
Control Delay		14.5			8.0			8.5			9.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.5			8.0			8.5			9.3	
LOS		B			A			A			A	
Approach Delay		14.5			8.0			8.5			9.3	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		19			7			41			52	
Queue Length 95th (ft)		71			44			110			141	
Internal Link Dist (ft)		930			1052			920			945	
Turn Bay Length (ft)												
Base Capacity (vph)		596			685			1448			1427	
Starvation Cap Reductn		0			0			0			0	

Lanes, Volumes, Timings
29: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.26			0.21			0.24			0.30	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 37.8

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 9.6

Intersection LOS: A

Intersection Capacity Utilization 64.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 29: Colebrook Rd & Harrisburg Ave

 Ø2	 Ø4
39 s	21 s
 Ø6	 Ø8
39 s	21 s

HCM 6th Signalized Intersection Summary
29: Colebrook Rd & Harrisburg Ave

2033 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	51	34	16	34	85	20	303	7	59	297	57
Future Volume (veh/h)	63	51	34	16	34	85	20	303	7	59	297	57
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	1724	1780	1837	1837	1795	1837	1724	1766	1794	1986	1958	1858
Adj Flow Rate, veh/h	66	53	35	17	35	89	21	316	7	61	309	59
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	8	4	0	0	3	0	5	2	0	0	2	9
Cap, veh/h	335	117	71	194	90	201	176	642	14	230	550	97
Arrive On Green	0.16	0.20	0.16	0.16	0.20	0.16	0.35	0.39	0.35	0.35	0.39	0.35
Sat Flow, veh/h	629	593	360	143	456	1024	47	1639	35	155	1405	249
Grp Volume(v), veh/h	154	0	0	141	0	0	344	0	0	429	0	0
Grp Sat Flow(s),veh/h/ln	1582	0	0	1623	0	0	1721	0	0	1808	0	0
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0
Cycle Q Clear(g_c), s	2.0	0.0	0.0	1.9	0.0	0.0	3.7	0.0	0.0	4.6	0.0	0.0
Prop In Lane	0.43		0.23	0.12		0.63	0.06		0.02	0.14		0.14
Lane Grp Cap(c), veh/h	458	0	0	418	0	0	760	0	0	803	0	0
V/C Ratio(X)	0.34	0.00	0.00	0.34	0.00	0.00	0.45	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	1118	0	0	1130	0	0	2447	0	0	2543	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.9	0.0	0.0	8.9	0.0	0.0	5.7	0.0	0.0	6.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.5	0.0	0.0	0.4	0.0	0.0	0.6	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(95%),veh/ln	0.9	0.0	0.0	0.8	0.0	0.0	1.5	0.0	0.0	2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.4	0.0	0.0	9.4	0.0	0.0	6.1	0.0	0.0	6.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h	154			141			344			429		
Approach Delay, s/veh	9.4			9.4			6.1			6.5		
Approach LOS	A			A			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	14.5			9.8			14.5			9.8		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	33.0			15.0			33.0			15.0		
Max Q Clear Time (g_c+I1), s	5.7			4.0			6.6			3.9		
Green Ext Time (p_c), s	1.4			0.4			1.9			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	7.2											
HCM 6th LOS	A											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	17	17	1	36	2	900	7	64	729	7
Future Volume (vph)	36	0	17	17	1	36	2	900	7	64	729	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	75		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1628	0	1129	1562	0	1727	1612	1648
Flt Permitted		0.951			0.880		0.331			0.242		
Satd. Flow (perm)	0	1655	1581	0	1456	0	393	1562	0	440	1612	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		38			1				39
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	50%	10%	29%	0%	9%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	18	0	57	0	2	945	0	67	759	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	17.0	17.0	17.0	17.0	17.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	24.3%		75.7%	75.7%		75.7%	75.7%	75.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		0.0	-1.0		0.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		6.0	5.0		6.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)		8.8	8.8		8.6		57.7	58.3		57.7	58.3	58.3
Actuated g/C Ratio		0.13	0.13		0.12		0.82	0.83		0.82	0.83	0.83
v/c Ratio		0.18	0.08		0.27		0.01	0.73		0.19	0.57	0.01
Control Delay		28.6	2.8		16.7		3.5	10.8		8.6	10.3	0.7
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		28.6	2.8		16.7		3.5	10.8		8.6	10.3	0.7
LOS		C	A		B		A	B		A	B	A
Approach Delay		20.3			16.7			10.8			10.1	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		15	0		7		0	201		17	251	0
Queue Length 95th (ft)		39	5		36		2	#581		m25	m324	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				75			225		100
Base Capacity (vph)		295	320		291		324	1301		362	1342	1379
Starvation Cap Reductn		0	0		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		0.13	0.06		0.20		0.01	0.73		0.19	0.57	0.01

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 63 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 10.9

Intersection LOS: B

Intersection Capacity Utilization 74.1%

ICU Level of Service D

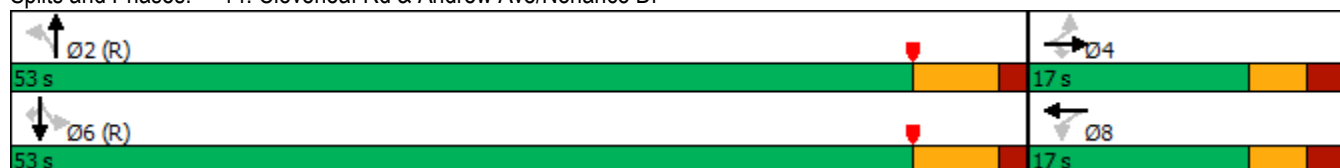
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



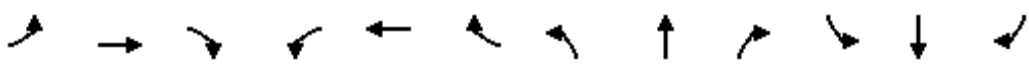
HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	17	17	1	36	2	900	7	64	729	7
Future Volume (veh/h)	36	0	17	17	1	36	2	900	7	64	729	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	1800	1800	1872	1875	1875	1875	1076	1637	1371	1875	1747	1950
Adj Flow Rate, veh/h	38	0	18	18	1	38	2	938	7	67	759	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	50	10	29	0	9	0
Cap, veh/h	228	0	125	93	10	72	414	1274	10	386	1371	1297
Arrive On Green	0.06	0.00	0.08	0.06	0.08	0.06	0.77	0.79	0.77	1.00	1.00	1.00
Sat Flow, veh/h	1584	0	1586	324	130	908	404	1623	12	595	1747	1652
Grp Volume(v), veh/h	38	0	18	57	0	0	2	0	945	67	759	7
Grp Sat Flow(s),veh/h/ln	1584	0	1586	1362	0	0	404	0	1635	595	1747	1652
Q Serve(g_s), s	0.0	0.0	0.7	1.6	0.0	0.0	0.1	0.0	20.6	3.5	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.7	3.0	0.0	0.0	0.1	0.0	20.6	24.1	0.0	0.0
Prop In Lane	1.00		1.00	0.32		0.67	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	205	0	125	156	0	0	414	0	1284	386	1371	1297
V/C Ratio(X)	0.18	0.00	0.14	0.37	0.00	0.00	0.00	0.00	0.74	0.17	0.55	0.01
Avail Cap(c_a), veh/h	337	0	283	308	0	0	414	0	1284	386	1371	1297
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.40	0.40	0.40
Uniform Delay (d), s/veh	30.8	0.0	30.0	31.6	0.0	0.0	1.8	0.0	3.8	4.6	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.4	0.0	0.0	0.0	0.0	3.8	0.4	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(95%),veh/ln	1.1	0.0	0.5	1.8	0.0	0.0	0.0	0.0	5.8	0.5	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	30.5	33.0	0.0	0.0	1.9	0.0	7.6	5.0	0.6	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h	56		57			947			833			
Approach Delay, s/veh	31.0		33.0			7.6			1.0			
Approach LOS	C		C			A			A			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	60.0		10.0			60.0			10.0			
Change Period (Y+Rc), s	6.0		5.5			6.0			5.5			
Max Green Setting (Gmax), s	47.0		11.5			47.0			11.5			
Max Q Clear Time (g_c+I1), s	22.6		3.5			26.1			5.0			
Green Ext Time (p_c), s	20.8		0.1			16.1			0.1			
Intersection Summary												
HCM 6th Ctrl Delay	6.2											
HCM 6th LOS	A											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	18	64	0	210	17	900	5	130	1158	35
Future Volume (vph)	15	0	18	64	0	210	17	900	5	130	1158	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	150		0	0		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1653	1581	0	1611	0	1693	1639	0	1727	1723	1648
Flt Permitted		0.417			0.915		0.100			0.185		
Satd. Flow (perm)	0	726	1581	0	1490	0	178	1639	0	336	1723	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		169			1				45
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		750			1000			600			1240	
Travel Time (s)		20.5			27.3			10.2			21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	19	0	288	0	18	952	0	137	1219	37
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	15.0	15.0	15.0	15.0	15.0		45.0	45.0		45.0	45.0	45.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		75.0%	75.0%		75.0%	75.0%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		0.0	-1.0		0.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		6.0	5.0		6.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		9.6	9.6		9.6		39.9	40.9		39.9	40.9	40.9
Actuated g/C Ratio		0.16	0.16		0.16		0.66	0.68		0.66	0.68	0.68
v/c Ratio		0.14	0.06		0.76		0.15	0.85		0.61	1.04	0.03
Control Delay		24.1	1.6		25.2		6.8	16.8		7.0	30.6	0.1
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		24.1	1.6		25.2		6.8	16.8		7.0	30.6	0.1
LOS		C	A		C		A	B		A	C	A
Approach Delay		11.9			25.2			16.6			27.5	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)		5	0		39		3	285		5	~536	0
Queue Length 95th (ft)		20	4		#141		m6	m373		m5	m44	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				150					100
Base Capacity (vph)		127	322		400		118	1117		223	1173	1137
Starvation Cap Reductn		0	0		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		0.13	0.06		0.72		0.15	0.85		0.61	1.04	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 25 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 23.1

Intersection LOS: C

Intersection Capacity Utilization 111.3%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	18	64	0	210	17	900	5	130	1158	35
Future Volume (veh/h)	15	0	18	64	0	210	17	900	5	130	1158	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	1800	1800	1872	1875	1875	1875	1778	1707	1778	1875	1846	1950
Adj Flow Rate, veh/h	16	0	11	67	0	206	18	947	5	137	1219	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	5	0	0	2	0
Cap, veh/h	267	0	278	128	13	206	393	1131	6	359	1231	1101
Arrive On Green	0.16	0.00	0.17	0.16	0.00	0.16	0.86	0.89	0.86	1.00	1.00	1.00
Sat Flow, veh/h	842	0	1586	307	76	1177	420	1697	9	591	1846	1652
Grp Volume(v), veh/h	16	0	11	273	0	0	18	0	952	137	1219	36
Grp Sat Flow(s),veh/h/ln	842	0	1586	1560	0	0	420	0	1706	591	1846	1652
Q Serve(g_s), s	0.0	0.0	0.3	7.7	0.0	0.0	0.4	0.0	14.7	8.2	0.0	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.3	9.5	0.0	0.0	0.4	0.0	14.7	22.9	0.0	0.0
Prop In Lane	1.00		1.00	0.25		0.75	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	253	0	278	322	0	0	393	0	1137	359	1231	1101
V/C Ratio(X)	0.06	0.00	0.04	0.85	0.00	0.00	0.05	0.00	0.84	0.38	0.99	0.03
Avail Cap(c_a), veh/h	253	0	278	322	0	0	393	0	1137	359	1231	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	21.2	0.0	20.6	25.2	0.0	0.0	1.4	0.0	2.0	4.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	18.7	0.0	0.0	0.2	0.0	7.4	0.3	5.8	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(95%),veh/ln	0.4	0.0	0.2	9.4	0.0	0.0	0.1	0.0	5.8	0.5	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	20.6	44.0	0.0	0.0	1.7	0.0	9.4	4.6	5.8	0.0
LnGrp LOS	C	A	C	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h	27			273			970			1392		
Approach Delay, s/veh	21.1			44.0			9.2			5.5		
Approach LOS	C			D			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			15.0			45.0			15.0		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	39.0			9.5			39.0			9.5		
Max Q Clear Time (g_c+I1), s	16.7			3.0			24.9			11.5		
Green Ext Time (p_c), s	19.3			0.0			13.8			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	11.0											
HCM 6th LOS	B											

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	13	25	0	149	16	855	7	164	904	7
Future Volume (vph)	5	1	13	25	0	149	16	855	7	164	904	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	11	13	12	12	12	12	11	12	12	11	14
Grade (%)		0%			-2%			2%			-2%	
Storage Length (ft)	0		125	0		0	75		0	225		100
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1670	1581	0	1596	0	1693	1671	0	1727	1723	1648
Flt Permitted		0.705			0.948		0.199			0.223		
Satd. Flow (perm)	0	1227	1581	0	1524	0	355	1671	0	405	1723	1648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		157			1				45
Link Speed (mph)		25			25			40				40
Link Distance (ft)		750			1000			600				1240
Travel Time (s)		20.5			27.3			10.2				21.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	14	0	183	0	17	907	0	173	952	7
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5		22.0	22.0		22.0	22.0	22.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0		44.0	44.0		44.0	44.0	44.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%		73.3%	73.3%		73.3%	73.3%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)		-1.0	-1.0		-1.0		0.0	-1.0		0.0	-1.0	-1.0
Total Lost Time (s)		4.5	4.5		4.5		6.0	5.0		6.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)		8.4	8.4		8.4		41.1	42.1		41.1	42.1	42.1
Actuated g/C Ratio		0.14	0.14		0.14		0.68	0.70		0.68	0.70	0.70
v/c Ratio		0.03	0.05		0.52		0.07	0.77		0.62	0.79	0.01
Control Delay		21.2	0.4		12.1		4.8	13.2		13.5	10.4	0.0
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		21.2	0.4		12.1		4.8	13.2		13.5	10.4	0.0
LOS		C	A		B		A	B		B	B	A
Approach Delay		6.6			12.1			13.0			10.8	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)		2	0		9		2	153		2	11	0
Queue Length 95th (ft)		10	0		54		9	#484		m30	m414	m0
Internal Link Dist (ft)		670			920			520			1160	

Lanes, Volumes, Timings
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)			125				75			225		100
Base Capacity (vph)		235	347		419		242	1171		277	1207	1168
Starvation Cap Reductn		0	0		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		0.03	0.04		0.44		0.07	0.77		0.62	0.79	0.01

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 33 (55%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 11.8

Intersection LOS: B

Intersection Capacity Utilization 91.0%

ICU Level of Service E

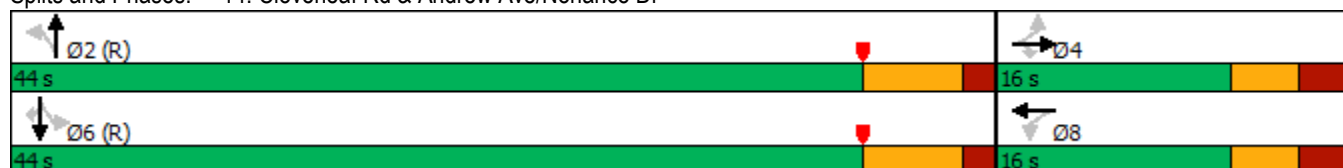
Analysis Period (min) 15

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.

Splits and Phases: 14: Cloverleaf Rd & Andrew Ave/Norlanco Dr



HCM 6th Signalized Intersection Summary
14: Cloverleaf Rd & Andrew Ave/Norlanco Dr

2033 Build w/ Improvements

SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	13	25	0	149	16	855	7	164	904	7
Future Volume (veh/h)	5	1	13	25	0	149	16	855	7	164	904	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	1800	1800	1872	1875	1875	1875	1778	1736	1778	1875	1846	1950
Adj Flow Rate, veh/h	5	1	7	26	0	153	17	900	7	173	952	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	3	0	0	2	0
Cap, veh/h	258	43	246	91	13	210	493	1180	9	320	1267	1134
Arrive On Green	0.14	0.16	0.16	0.14	0.00	0.14	0.67	0.69	0.67	1.00	1.00	1.00
Sat Flow, veh/h	954	277	1586	145	85	1353	557	1720	13	616	1846	1652
Grp Volume(v), veh/h	6	0	7	179	0	0	17	0	907	173	952	7
Grp Sat Flow(s),veh/h/ln	1231	0	1586	1583	0	0	557	0	1733	616	1846	1652
Q Serve(g_s), s	0.0	0.0	0.2	3.6	0.0	0.0	0.6	0.0	20.7	14.9	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.2	6.6	0.0	0.0	0.6	0.0	20.7	35.6	0.0	0.0
Prop In Lane	0.83		1.00	0.15		0.85	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	281	0	246	288	0	0	493	0	1190	320	1267	1134
V/C Ratio(X)	0.02	0.00	0.03	0.62	0.00	0.00	0.03	0.00	0.76	0.54	0.75	0.01
Avail Cap(c_a), veh/h	326	0	304	345	0	0	493	0	1190	320	1267	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.32	0.32	0.32
Uniform Delay (d), s/veh	21.8	0.0	21.5	24.6	0.0	0.0	3.4	0.0	6.2	9.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.5	0.0	0.0	0.1	0.0	4.7	2.1	1.4	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(95%),veh/ln	0.1	0.0	0.1	4.7	0.0	0.0	0.1	0.0	8.9	2.2	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	21.5	27.1	0.0	0.0	3.5	0.0	10.8	11.2	1.4	0.0
LnGrp LOS	C	A	C	C	A	A	A	A	B	B	A	A
Approach Vol, veh/h	13			179			924			1132		
Approach Delay, s/veh	21.7			27.1			10.7			2.9		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	46.2			13.8			46.2			13.8		
Change Period (Y+Rc), s	6.0			5.5			6.0			5.5		
Max Green Setting (Gmax), s	38.0			10.5			38.0			10.5		
Max Q Clear Time (g_c+I1), s	22.7			2.2			37.6			8.6		
Green Ext Time (p_c), s	13.4			0.0			0.4			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	8.1											
HCM 6th LOS	A											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	440	20	133	9	13	78	55	900	9	11	674	195
Future Volume (vph)	440	20	133	9	13	78	55	900	9	11	674	195
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	1558	0	1391	1565	0	1500	1616	0	1628	1613	1486
Flt Permitted	0.692			0.650			0.202			0.107		
Satd. Flow (perm)	1168	1558	0	951	1565	0	319	1616	0	183	1613	1486
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		148			87			1				217
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	5%	13%	8%	1%	8%	9%	25%	0%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	489	170	0	10	101	0	61	1010	0	12	749	217
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	27.0	27.0		27.0	27.0		43.0	43.0		43.0	43.0	43.0
Total Split (%)	38.6%	38.6%		38.6%	38.6%		61.4%	61.4%		61.4%	61.4%	61.4%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)	22.0	22.0		22.0	22.0		37.5	37.5		37.5	37.5	36.5
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.54	0.54		0.54	0.54	0.52
v/c Ratio	1.33	0.29		0.03	0.18		0.36	1.17		0.12	0.87	0.25
Control Delay	192.6	6.2		17.2	6.7		13.1	102.9		11.8	27.4	2.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	192.6	6.2		17.2	6.7		13.1	102.9		11.8	27.4	2.2
LOS	F	A		B	A		B	F		B	C	A
Approach Delay		144.5			7.6			97.8			21.6	
Approach LOS		F			A			F			C	
Queue Length 50th (ft)	~280	7		3	4		7	~535		2	258	0
Queue Length 95th (ft)	#451	46		13	35		m15	#747		12	#489	28

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)	920			920			1160			2095		
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	367	591		298	551		170	866		98	864	878
Starvation Cap Reductn	0	0		0	0		0	0		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	1.33	0.29		0.03	0.18		0.36	1.17		0.12	0.87	0.25

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.33

Intersection Signal Delay: 78.7

Intersection LOS: E

Intersection Capacity Utilization 91.7%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

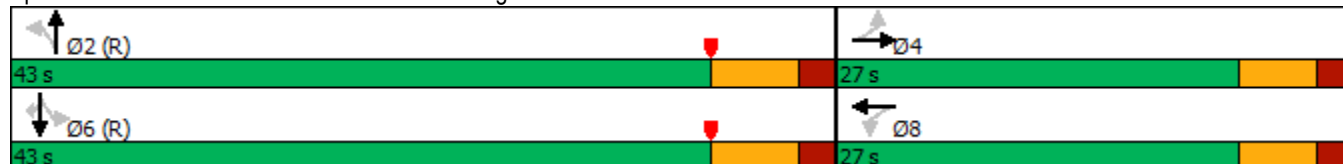
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	20	133	9	13	78	55	900	9	11	674	195
Future Volume (veh/h)	440	20	133	9	13	78	55	900	9	11	674	195
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	1958	2066	1915	1567	1703	1736	1798	1784	1556	1949	1807	1878
Adj Flow Rate, veh/h	489	22	148	10	14	87	61	1000	10	12	749	217
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	5	13	8	1	8	9	25	0	10	5
Cap, veh/h	459	73	488	348	64	399	219	944	9	118	968	830
Arrive On Green	0.31	0.31	0.30	0.31	0.31	0.30	1.00	1.00	1.00	0.54	0.54	0.52
Sat Flow, veh/h	1353	231	1552	1017	204	1268	559	1763	18	582	1807	1591
Grp Volume(v), veh/h	489	0	170	10	0	101	61	0	1010	12	749	217
Grp Sat Flow(s),veh/h/ln	1353	0	1783	1017	0	1472	559	0	1781	582	1807	1591
Q Serve(g_s), s	18.4	0.0	5.1	0.5	0.0	3.6	5.9	0.0	35.6	1.4	23.0	5.3
Cycle Q Clear(g_c), s	22.0	0.0	5.1	5.7	0.0	3.6	28.9	0.0	35.6	37.1	23.0	5.3
Prop In Lane	1.00		0.87	1.00		0.86	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	459	0	560	348	0	463	219	0	954	118	968	830
V/C Ratio(X)	1.07	0.00	0.30	0.03	0.00	0.22	0.28	0.00	1.06	0.10	0.77	0.26
Avail Cap(c_a), veh/h	459	0	560	348	0	463	219	0	954	118	968	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.61	0.00	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	18.5	20.4	0.0	18.0	8.9	0.0	0.0	33.8	12.9	9.3
Incr Delay (d2), s/veh	60.8	0.0	0.3	0.0	0.0	0.2	1.9	0.0	40.1	1.7	6.0	0.8
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(95%),veh/ln	22.5	0.0	3.6	0.2	0.0	2.1	1.0	0.0	15.5	0.4	13.8	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.7	0.0	18.8	20.4	0.0	18.2	10.8	0.0	40.1	35.6	18.9	10.0
LnGrp LOS	F	A	B	C	A	B	B	A	F	D	B	B
Approach Vol, veh/h	659			111			1071			978		
Approach Delay, s/veh	70.7			18.4			38.5			17.1		
Approach LOS	E			B			D			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			27.0			43.0			27.0		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	36.5			21.0			36.5			21.0		
Max Q Clear Time (g_c+I1), s	37.6			24.0			25.0			7.7		
Green Ext Time (p_c), s	0.0			0.0			9.8			0.3		
Intersection Summary												
HCM 6th Ctrl Delay	37.8											
HCM 6th LOS	D											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	329	35	145	10	43	37	133	921	14	51	1169	455
Future Volume (vph)	329	35	145	10	43	37	133	921	14	51	1169	455
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1649	0	1416	1704	0	1620	1696	0	1628	1740	1545
Flt Permitted	0.702			0.603			0.107			0.129		
Satd. Flow (perm)	1197	1649	0	899	1704	0	182	1696	0	221	1740	1545
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		79			39			2				479
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	11%	0%	0%	0%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	346	190	0	11	84	0	140	984	0	54	1231	479
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	43.0
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	71.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)	12.0	12.0		12.0	12.0		37.5	37.5		37.5	37.5	36.5
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.62	0.62		0.62	0.62	0.61
v/c Ratio	1.45	0.48		0.06	0.23		1.24	0.93		0.39	1.13	0.43
Control Delay	248.7	17.5		20.6	14.4		163.5	24.2		15.9	87.5	1.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	248.7	17.5		20.6	14.4		163.5	24.2		15.9	87.5	1.9
LOS	F	B		C	B		F	C		B	F	A
Approach Delay		166.7			15.1			41.5			62.0	
Approach LOS		F			B			D			E	
Queue Length 50th (ft)	~176	35		3	14		~118	390		8	~535	0
Queue Length 95th (ft)	#316	87		15	45		m#155	#550		38	#752	28
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	239	393		179	372		113	1060		138	1087	1127
Starvation Cap Reductn	0	0		0	0		0	0		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	1.45	0.48		0.06	0.23		1.24	0.93		0.39	1.13	0.43

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.45

Intersection Signal Delay: 70.2

Intersection LOS: E

Intersection Capacity Utilization 114.2%

ICU Level of Service H

Analysis Period (min) 15

~ 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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	35	145	10	43	37	133	921	14	51	1169	455
Future Volume (veh/h)	329	35	145	10	43	37	133	921	14	51	1169	455
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	1972	2066	1958	1595	1820	1750	1912	1855	1912	1949	1921	1935
Adj Flow Rate, veh/h	346	37	129	11	45	25	140	969	14	54	1231	468
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	11	0	0	0	4	0	0	2	1
Cap, veh/h	352	81	282	243	220	122	120	1140	16	239	1200	997
Arrive On Green	0.20	0.20	0.18	0.20	0.20	0.18	0.63	0.63	0.61	0.63	0.63	0.61
Sat Flow, veh/h	1403	404	1408	1040	1099	611	295	1824	26	597	1921	1640
Grp Volume(v), veh/h	346	0	166	11	0	70	140	0	983	54	1231	468
Grp Sat Flow(s),veh/h/ln	1403	0	1812	1040	0	1710	295	0	1850	597	1921	1640
Q Serve(g_s), s	9.9	0.0	4.9	0.6	0.0	2.1	0.0	0.0	25.5	4.8	37.5	9.4
Cycle Q Clear(g_c), s	12.0	0.0	4.9	5.5	0.0	2.1	37.5	0.0	25.5	30.3	37.5	9.4
Prop In Lane	1.00		0.78	1.00		0.36	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	352	0	362	243	0	342	120	0	1156	239	1200	997
V/C Ratio(X)	0.98	0.00	0.46	0.05	0.00	0.20	1.17	0.00	0.85	0.23	1.03	0.47
Avail Cap(c_a), veh/h	352	0	362	243	0	342	120	0	1156	239	1200	997
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.41	0.00	0.41	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	21.5	23.6	0.0	20.2	30.0	0.0	9.0	21.1	11.3	6.4
Incr Delay (d2), s/veh	42.9	0.0	0.9	0.1	0.0	0.3	105.6	0.0	3.4	2.2	32.7	1.6
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(95%),veh/ln	13.8	0.0	3.6	0.2	0.0	1.4	8.3	0.0	10.0	1.3	28.1	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	0.0	22.4	23.6	0.0	20.5	135.6	0.0	12.5	23.3	43.9	8.0
LnGrp LOS	E	A	C	C	A	C	F	A	B	C	F	A
Approach Vol, veh/h	512		81				1123				1753	
Approach Delay, s/veh	54.3		20.9				27.8				33.7	
Approach LOS	D		C				C				C	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	43.0		17.0		43.0		17.0					
Change Period (Y+Rc), s	6.5		6.0		6.5		6.0					
Max Green Setting (Gmax), s	36.5		11.0		36.5		11.0					
Max Q Clear Time (g_c+I1), s	27.5		14.0		39.5		7.5					
Green Ext Time (p_c), s	8.4		0.0		0.0		0.1					
Intersection Summary												
HCM 6th Ctrl Delay	34.5											
HCM 6th LOS	C											

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements
SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	25	116	12	22	34	86	913	9	20	923	189
Future Volume (vph)	159	25	116	12	22	34	86	913	9	20	923	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	10	13	12	10	13	12	10	11	12	10	11	12
Grade (%)		-5%			3%			-3%			-4%	
Storage Length (ft)	225		0	75		0	75		0	100		400
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1620	1643	0	1572	1634	0	1620	1713	0	1550	1757	1561
Flt Permitted	0.719			0.663			0.124			0.125		
Satd. Flow (perm)	1226	1643	0	1097	1634	0	211	1713	0	204	1757	1561
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		117			36			1				199
Link Speed (mph)		35			35			40				40
Link Distance (ft)		1000			1000			1240				2175
Travel Time (s)		19.5			19.5			21.1				37.1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	0%	3%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	148	0	13	59	0	91	970	0	21	972	199
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	13.0	13.0		13.0	13.0		22.5	22.5		22.5	22.5	22.5
Total Split (s)	20.0	20.0		20.0	20.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.5	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.5	5.5		5.5	5.5	6.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Act Effect Green (s)	12.9	12.9		12.9	12.9		36.6	36.6		36.6	36.6	35.6
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.61	0.61		0.61	0.61	0.59
v/c Ratio	0.63	0.33		0.06	0.16		0.71	0.93		0.17	0.91	0.20
Control Delay	32.3	8.5		18.0	10.9		37.9	25.3		10.2	26.8	1.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	32.3	8.5		18.0	10.9		37.9	25.3		10.2	26.8	1.7
LOS	C	A		B	B		D	C		B	C	A
Approach Delay		21.1			12.2			26.4			22.3	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	53	9		4	6		26	357		3	285	0
Queue Length 95th (ft)	107	47		15	30		m#56	#607		15	#566	22
Internal Link Dist (ft)		920			920			1160			2095	

Lanes, Volumes, Timings
11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements

SAT Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			75			75			100		400
Base Capacity (vph)	306	498		274	435		128	1044		124	1071	1006
Starvation Cap Reductn	0	0		0	0		0	0		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	0.55	0.30		0.05	0.14		0.71	0.93		0.17	0.91	0.20

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 23.5

Intersection LOS: C

Intersection Capacity Utilization 90.6%

ICU Level of Service E

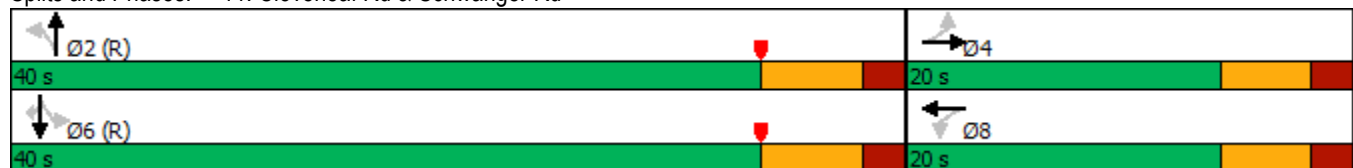
Analysis Period (min) 15

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.

Splits and Phases: 11: Cloverleaf Rd & Schwanger Rd



HCM 6th Signalized Intersection Summary

11: Cloverleaf Rd & Schwanger Rd

2033 Build w/ Improvements
SAT Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	25	116	12	22	34	86	913	9	20	923	189
Future Volume (veh/h)	159	25	116	12	22	34	86	913	9	20	923	189
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	1972	2066	1958	1750	1820	1708	1912	1869	1912	1878	1935	1949
Adj Flow Rate, veh/h	167	26	95	13	23	22	91	961	8	21	972	165
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	2	0	0	3	0	3	0	5	1	0
Cap, veh/h	358	73	267	274	161	154	257	1179	10	225	1232	1024
Arrive On Green	0.19	0.19	0.17	0.19	0.19	0.17	0.43	0.43	0.42	0.64	0.64	0.62
Sat Flow, veh/h	1435	389	1421	1189	855	818	506	1851	15	582	1935	1652
Grp Volume(v), veh/h	167	0	121	13	0	45	91	0	969	21	972	165
Grp Sat Flow(s),veh/h/ln	1435	0	1810	1189	0	1673	506	0	1866	582	1935	1652
Q Serve(g_s), s	6.6	0.0	3.5	0.6	0.0	1.4	10.1	0.0	27.4	1.8	22.0	2.5
Cycle Q Clear(g_c), s	8.0	0.0	3.5	4.1	0.0	1.4	32.1	0.0	27.4	29.2	22.0	2.5
Prop In Lane	1.00		0.79	1.00		0.49	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	358	0	341	274	0	315	257	0	1188	225	1232	1024
V/C Ratio(X)	0.47	0.00	0.36	0.05	0.00	0.14	0.35	0.00	0.82	0.09	0.79	0.16
Avail Cap(c_a), veh/h	446	0	452	347	0	418	257	0	1188	225	1232	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	0.54	0.00	0.54	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.6	0.0	21.5	23.0	0.0	20.5	25.7	0.0	14.1	20.9	8.0	4.8
Incr Delay (d2), s/veh	0.9	0.0	0.6	0.1	0.0	0.2	2.1	0.0	3.5	0.8	5.2	0.3
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(95%),veh/ln	3.8	0.0	2.6	0.3	0.0	0.9	2.4	0.0	16.2	0.5	11.4	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	0.0	22.2	23.1	0.0	20.7	27.7	0.0	17.6	21.7	13.1	5.1
LnGrp LOS	C	A	C	C	A	C	C	A	B	C	B	A
Approach Vol, veh/h	288			58			1060			1158		
Approach Delay, s/veh	23.6			21.3			18.4			12.2		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.7			16.3			43.7			16.3		
Change Period (Y+Rc), s	6.5			6.0			6.5			6.0		
Max Green Setting (Gmax), s	33.5			14.0			33.5			14.0		
Max Q Clear Time (g_c+I1), s	29.4			10.0			24.0			6.1		
Green Ext Time (p_c), s	3.9			0.4			9.0			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	16.2											
HCM 6th LOS	B											