

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗				↑
Traffic Vol, veh/h	245	210	0	0	0	150
Future Vol, veh/h	245	210	0	0	0	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	5	1	0	0	0	2
Mvmt Flow	282	241	0	0	0	172

Major/Minor	Minor1		Major2	
Conflicting Flow All	172	0	-	-
Stage 1	0	-	-	-
Stage 2	172	-	-	-
Critical Hdwy	6.45	6.21	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-
Follow-up Hdwy	3.545	3.309	-	-
Pot Cap-1 Maneuver	811	-	0	-
Stage 1	-	-	0	-
Stage 2	851	-	0	-
Platoon blocked, %				
Mov Cap-1 Maneuver	811	-	-	-
Mov Cap-2 Maneuver	811	-	-	-
Stage 1	-	-	-	-
Stage 2	851	-	-	-

Approach	WB	SB
HCM Control Delay, s		0
HCM LOS	-	

Minor Lane/Major Mvmt	WBLn1WBLn2	SBT
Capacity (veh/h)	811	-
HCM Lane V/C Ratio	0.347	-
HCM Control Delay (s)	11.8	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	1.6	-

Intersection						
Int Delay, s/veh	4.6					
Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	350	225	0
Future Vol, veh/h	0	0	0	350	225	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	380	245	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 190
Stage 1	-	- 0
Stage 2	-	- 190
Critical Hdwy	-	- 6.84
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.84
Follow-up Hdwy	-	- 3.52
Pot Cap-1 Maneuver	0	- 781
Stage 1	0	- - 0
Stage 2	0	- 823
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 781
Mov Cap-2 Maneuver	-	- 781
Stage 1	-	- -
Stage 2	-	- 823

Approach	WB	NE
HCM Control Delay, s	0	11.7
HCM LOS		B

Minor Lane/Major Mvmt	NELn1	WBT
Capacity (veh/h)	781	-
HCM Lane V/C Ratio	0.313	-
HCM Control Delay (s)	11.7	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	1.3	-

HCM Signalized Intersection Capacity Analysis
 40: 6th St/I-5 SB Off-Ramp & Morgan Ln & Scoville Rd

Baseline 2018 PM Peak
 12/05/2018



Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations	↑	↑	↑	↑		↑↓			↑↓	
Traffic Volume (vph)	145	230	160	240	20	540	30	40	270	85
Future Volume (vph)	145	230	160	240	20	540	30	40	270	85
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00		0.95			0.97	
Frpb, ped/bikes	1.00	0.98	1.00	1.00		1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.85	1.00	1.00		0.99			0.97	
Flt Protected	1.00	1.00	0.95	1.00		1.00			0.96	
Satd. Flow (prot)	1699	1417	1628	1667		3202			3061	
Flt Permitted	1.00	1.00	0.38	1.00		1.00			0.96	
Satd. Flow (perm)	1699	1417	651	1667		3202			3061	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	148	235	163	245	20	551	31	41	276	87
RTOR Reduction (vph)	0	203	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	148	32	163	245	0	599	0	0	404	0
Confl. Peds. (#/hr)		3	3		2		2	2		2
Heavy Vehicles (%)	3%	3%	2%	5%	0%	3%	0%	0%	4%	0%
Turn Type	NA	Perm	pm+pt	NA	Split	NA		Prot	Prot	
Protected Phases	8		7	4	2	2		6	6	
Permitted Phases		8	4							
Actuated Green, G (s)	11.5	11.5	30.1	30.1		24.1			18.8	
Effective Green, g (s)	12.0	12.0	30.6	30.6		25.5			20.2	
Actuated g/C Ratio	0.14	0.14	0.35	0.35		0.29			0.23	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.4			5.4	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		4.4			4.3	
Lane Grp Cap (vph)	230	192	387	577		924			700	
v/s Ratio Prot	c0.09		0.07	c0.15		c0.19			c0.13	
v/s Ratio Perm		0.02	0.08							
v/c Ratio	0.64	0.17	0.42	0.42		0.65			0.58	
Uniform Delay, d1	36.1	33.7	21.3	22.1		27.5			30.3	
Progression Factor	1.00	1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	5.4	0.3	0.5	0.4		1.9			1.5	
Delay (s)	41.5	34.0	21.8	22.5		29.4			31.8	
Level of Service	D	C	C	C		C			C	
Approach Delay (s)	36.9			22.2		29.4			31.8	
Approach LOS	D			C		C			C	

Intersection Summary				
HCM 2000 Control Delay		29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.61		
Actuated Cycle Length (s)		88.3	Sum of lost time (s)	18.8
Intersection Capacity Utilization		62.1%	ICU Level of Service	B
Analysis Period (min)		15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
50: 7th St & Morgan Ln/I-5 SB On-Ramp

Baseline 2018 PM Peak
12/05/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	65	145	0	0	0	0	395	700	245	0	0	0	
Future Volume (vph)	65	145	0	0	0	0	395	700	245	0	0	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0						4.0	4.0				
Lane Util. Factor	1.00	1.00						0.95	1.00				
Frbp, ped/bikes	1.00	1.00						1.00	0.98				
Flpb, ped/bikes	1.00	1.00						1.00	1.00				
Frt	1.00	1.00						1.00	0.85				
Flt Protected	0.95	1.00						0.98	1.00				
Satd. Flow (prot)	1624	1716						3186	1424				
Flt Permitted	0.95	1.00						0.98	1.00				
Satd. Flow (perm)	1624	1716						3186	1424				
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	
Adj. Flow (vph)	76	169	0	0	0	0	459	814	285	0	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	107	0	0	0	
Lane Group Flow (vph)	76	169	0	0	0	0	0	1273	178	0	0	0	
Confl. Peds. (#/hr)	5						3		3				
Heavy Vehicles (%)	2%	2%	0%	0%	0%	0%	3%	2%	2%	0%	0%	0%	
Turn Type	Perm	NA					Perm	NA	Perm				
Protected Phases		4						2					
Permitted Phases	4						2		2				
Actuated Green, G (s)	9.3	9.3						28.3	28.3				
Effective Green, g (s)	9.8	9.8						29.8	29.8				
Actuated g/C Ratio	0.21	0.21						0.63	0.63				
Clearance Time (s)	4.5	4.5						5.5	5.5				
Vehicle Extension (s)	2.5	2.5						5.2	5.2				
Lane Grp Cap (vph)	334	353						1994	891				
v/s Ratio Prot		c0.10											
v/s Ratio Perm	0.05							0.40	0.13				
v/c Ratio	0.23	0.48						0.64	0.20				
Uniform Delay, d1	15.7	16.6						5.5	3.8				
Progression Factor	1.00	1.00						1.00	1.00				
Incremental Delay, d2	0.3	0.7						1.0	0.2				
Delay (s)	16.0	17.4						6.5	4.1				
Level of Service	B	B						A	A				
Approach Delay (s)		17.0			0.0			6.1			0.0		
Approach LOS		B			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			7.6									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.60										
Actuated Cycle Length (s)			47.6									Sum of lost time (s)	8.0
Intersection Capacity Utilization			48.4%									ICU Level of Service	A
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
60: 6th St & Hillcrest Dr

Baseline 2018 PM Peak
12/05/2018






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖			↖			↖↗↘	
Traffic Volume (vph)	0	80	130	180	145	0	0	0	0	150	1010	40
Future Volume (vph)	0	80	130	180	145	0	0	0	0	150	1010	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.91	
Frbp, ped/bikes		0.99		1.00	1.00						1.00	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.92		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1579		1662	1750						4715	
Flt Permitted		1.00		0.62	1.00						0.99	
Satd. Flow (perm)		1579		1085	1750						4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	84	137	189	153	0	0	0	0	158	1063	42
RTOR Reduction (vph)	0	46	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	175	0	189	153	0	0	0	0	0	1257	0
Confl. Peds. (#/hr)			1	1								1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Turn Type		NA		Perm	NA						Perm	NA
Protected Phases		8			4							6
Permitted Phases				4						6		
Actuated Green, G (s)		13.5		13.5	13.5						18.6	
Effective Green, g (s)		13.5		13.5	13.5						18.6	
Actuated g/C Ratio		0.34		0.34	0.34						0.46	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Vehicle Extension (s)		2.5		2.5	2.5						3.9	
Lane Grp Cap (vph)		531		365	589						2187	
v/s Ratio Prot		0.11			0.09							
v/s Ratio Perm				c0.17							0.27	
v/c Ratio		0.33		0.52	0.26						0.57	
Uniform Delay, d1		9.9		10.7	9.7						7.9	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		0.3		0.9	0.2						0.4	
Delay (s)		10.2		11.6	9.8						8.3	
Level of Service		B		B	A						A	
Approach Delay (s)		10.2			10.8			0.0			8.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.0			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			40.1			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			59.9%			ICU Level of Service				B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
70: 7th St & Hillcrest Dr

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Traffic Volume (vph)	150	80	0	0	65	70	245	1310	50	0	0	0
Future Volume (vph)	150	80	0	0	65	70	245	1310	50	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0				
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		1.00				
Flt Protected	0.95	1.00			1.00	1.00		0.99				
Satd. Flow (prot)	1610	1750			1750	1465		4674				
Flt Permitted	0.71	1.00			1.00	1.00		0.99				
Satd. Flow (perm)	1200	1750			1750	1465		4674				
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	172	92	0	0	75	80	282	1506	57	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	23	0	4	0	0	0	0
Lane Group Flow (vph)	172	92	0	0	75	57	0	1841	0	0	0	0
Confl. Peds. (#/hr)	4					4	4		6			
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8					4	2					
Actuated Green, G (s)	12.9	12.9			12.9	12.9		30.5				
Effective Green, g (s)	12.9	12.9			12.9	12.9		31.5				
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.60				
Clearance Time (s)	4.0	4.0			4.0	4.0		5.0				
Vehicle Extension (s)	2.5	2.5			2.5	2.5		5.0				
Lane Grp Cap (vph)	295	430			430	360		2809				
v/s Ratio Prot		0.05			0.04							
v/s Ratio Perm	c0.14					0.04		0.39				
v/c Ratio	0.58	0.21			0.17	0.16		0.66				
Uniform Delay, d1	17.4	15.7			15.6	15.5		6.9				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	2.4	0.2			0.1	0.1		0.8				
Delay (s)	19.8	15.9			15.7	15.6		7.6				
Level of Service	B	B			B	B		A				
Approach Delay (s)		18.4			15.7			7.6			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.4				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			52.4				Sum of lost time (s)		8.0			
Intersection Capacity Utilization			59.9%				ICU Level of Service		B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
80: 6th St & Savage St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔↔↔	
Traffic Volume (vph)	0	65	50	145	70	0	0	0	0	85	1395	35
Future Volume (vph)	0	65	50	145	70	0	0	0	0	85	1395	35
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.91	
Frt		0.94		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1648		1662	1750						4748	
Flt Permitted		1.00		0.66	1.00						1.00	
Satd. Flow (perm)		1648		1162	1750						4748	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	68	52	151	73	0	0	0	0	89	1453	36
RTOR Reduction (vph)	0	34	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	86	0	151	73	0	0	0	0	0	1576	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA						Perm	NA
Protected Phases		8			4							6
Permitted Phases				4						6		
Actuated Green, G (s)		14.3		14.3	14.3						52.7	
Effective Green, g (s)		14.3		14.3	14.3						52.7	
Actuated g/C Ratio		0.19		0.19	0.19						0.70	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Vehicle Extension (s)		2.5		2.5	2.5						0.2	
Lane Grp Cap (vph)		314		221	333						3336	
v/s Ratio Prot		0.05			0.04							
v/s Ratio Perm				0.13							0.33	
v/c Ratio		0.27		0.68	0.22						0.47	
Uniform Delay, d1		25.9		28.2	25.6						5.0	
Progression Factor		1.00		0.91	0.87						1.00	
Incremental Delay, d2		0.3		7.4	0.2						0.5	
Delay (s)		26.3		33.0	22.6						5.4	
Level of Service		C		C	C						A	
Approach Delay (s)		26.3			29.6			0.0			5.4	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.6		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			57.7%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
90: 7th St & Savage St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑			↗			↖↗				
Traffic Volume (vph)	85	95	0	0	60	55	120	1365	55	0	0	0
Future Volume (vph)	85	95	0	0	60	55	120	1365	55	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.94			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1662	1750			1637			4692				
Flt Permitted	0.61	1.00			1.00			1.00				
Satd. Flow (perm)	1076	1750			1637			4692				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	103	0	0	65	60	130	1484	60	0	0	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	3	0	0	0	0
Lane Group Flow (vph)	92	103	0	0	91	0	0	1671	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8						2					
Actuated Green, G (s)	9.6	9.6			9.6			57.4				
Effective Green, g (s)	9.6	9.6			9.6			57.4				
Actuated g/C Ratio	0.13	0.13			0.13			0.77				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Vehicle Extension (s)	2.5	2.5			2.5			0.2				
Lane Grp Cap (vph)	137	224			209			3590				
v/s Ratio Prot		0.06			0.06							
v/s Ratio Perm	c0.09							0.36				
v/c Ratio	0.67	0.46			0.44			0.47				
Uniform Delay, d1	31.2	30.3			30.2			3.2				
Progression Factor	1.02	1.02			1.00			0.82				
Incremental Delay, d2	10.8	1.1			1.1			0.4				
Delay (s)	42.7	32.0			31.3			3.1				
Level of Service	D	C			C			A				
Approach Delay (s)		37.1			31.3			3.1			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 100: 6th St & Evelyn Ave

Baseline 2018 PM Peak
 12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔↔↔	
Traffic Volume (vph)	0	10	25	40	20	0	0	0	0	30	1600	40
Future Volume (vph)	0	10	25	40	20	0	0	0	0	30	1600	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frt		0.90			1.00						1.00	
Flt Protected		1.00			0.97						1.00	
Satd. Flow (prot)		1582			1694						4756	
Flt Permitted		1.00			0.78						1.00	
Satd. Flow (perm)		1582			1361						4756	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	11	27	43	22	0	0	0	0	33	1739	43
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	19	0	0	65	0	0	0	0	0	1813	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA						Perm	NA
Protected Phases		8			4							6
Permitted Phases				4						6		
Actuated Green, G (s)		7.8			7.8						59.2	
Effective Green, g (s)		7.8			7.8						59.2	
Actuated g/C Ratio		0.10			0.10						0.79	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		2.5			2.5						0.2	
Lane Grp Cap (vph)		164			141						3754	
v/s Ratio Prot		0.01										
v/s Ratio Perm					0.05							0.38
v/c Ratio		0.12			0.46							0.48
Uniform Delay, d1		30.5			31.6							2.7
Progression Factor		1.00			0.63							0.84
Incremental Delay, d2		0.2			1.6							0.4
Delay (s)		30.7			21.5							2.7
Level of Service		C			C							A
Approach Delay (s)		30.7			21.5			0.0				2.7
Approach LOS		C			C			A				A
Intersection Summary												
HCM 2000 Control Delay			3.9		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)					8.0		
Intersection Capacity Utilization			52.1%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↖↖	
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	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	-	-	16974	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Minor2		Major2	
Conflicting Flow All	-	1	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	1083	-	0
Stage 1	0	-	-	0
Stage 2	0	-	-	0
Platoon blocked, %			-	
Mov Cap-1 Maneuver	-	1083	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

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

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

HCM Signalized Intersection Capacity Analysis
110: 7th St & Evelyn Ave

Baseline 2018 PM Peak
12/05/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↵	↵↵↵			
Traffic Volume (vph)	0	22	1440	15	0	0
Future Volume (vph)	0	22	1440	15	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		1.00	0.91			
Frt		0.86	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1514	4724			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1514	4724			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	24	1582	16	0	0
RTOR Reduction (vph)	0	23	1	0	0	0
Lane Group Flow (vph)	0	1	1597	0	0	0
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Turn Type		Prot	NA			
Protected Phases		8	2			
Permitted Phases						
Actuated Green, G (s)		2.0	55.3			
Effective Green, g (s)		2.0	55.3			
Actuated g/C Ratio		0.03	0.74			
Clearance Time (s)		4.0	4.0			
Vehicle Extension (s)		0.2	0.2			
Lane Grp Cap (vph)		40	3483			
v/s Ratio Prot		c0.00	c0.34			
v/s Ratio Perm						
v/c Ratio		0.02	0.46			
Uniform Delay, d1		35.5	3.9			
Progression Factor		1.00	1.83			
Incremental Delay, d2		0.1	0.4			
Delay (s)		35.6	7.5			
Level of Service		D	A			
Approach Delay (s)	35.6		7.5		0.0	
Approach LOS	D		A		A	
Intersection Summary						
HCM 2000 Control Delay			7.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			41.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
115: 7th St & Evelyn Ave

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶			↕↕↕		
Traffic Volume (vph)	45	0	67	1395	0	0
Future Volume (vph)	45	0	67	1395	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0			4.0		
Lane Util. Factor	1.00			0.91		
Frt	1.00			1.00		
Flt Protected	0.95			1.00		
Satd. Flow (prot)	1662			4721		
Flt Permitted	0.95			1.00		
Satd. Flow (perm)	1662			4721		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	49	0	74	1533	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	49	0	0	1607	0	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%
Turn Type	Prot		Split	NA		
Protected Phases	4		2	2		
Permitted Phases						
Actuated Green, G (s)	5.7			55.3		
Effective Green, g (s)	5.7			55.3		
Actuated g/C Ratio	0.08			0.74		
Clearance Time (s)	4.0			4.0		
Vehicle Extension (s)	0.2			0.2		
Lane Grp Cap (vph)	126			3480		
v/s Ratio Prot	c0.03			c0.34		
v/s Ratio Perm						
v/c Ratio	0.39			0.46		
Uniform Delay, d1	33.0			3.9		
Progression Factor	1.06			0.09		
Incremental Delay, d2	0.7			0.4		
Delay (s)	35.5			0.7		
Level of Service	D			A		
Approach Delay (s)	35.5			0.7	0.0	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			




















HCM Signalized Intersection Capacity Analysis
120: 6th St & A St

Baseline 2018 PM Peak
12/05/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑	↗	↘	↑						↑↑↑	↗	
Traffic Volume (vph)	0	165	135	130	215	0	0	0	0	105	1595	95	
Future Volume (vph)	0	165	135	130	215	0	0	0	0	105	1595	95	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00	
Frt		1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00						1.00	1.00	
Satd. Flow (prot)		1750	1488	1662	1750						4763	1488	
Flt Permitted		1.00	1.00	0.45	1.00						1.00	1.00	
Satd. Flow (perm)		1750	1488	784	1750						4763	1488	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	179	147	141	234	0	0	0	0	114	1734	103	
RTOR Reduction (vph)	0	0	97	0	0	0	0	0	0	0	0	41	
Lane Group Flow (vph)	0	179	50	141	234	0	0	0	0	0	1848	62	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type		NA	Perm	pm+pt	NA						Perm	NA	Perm
Protected Phases		4		3	8							6	
Permitted Phases			4	8						6			6
Actuated Green, G (s)		17.0	17.0	34.4	34.4						32.6	32.6	
Effective Green, g (s)		17.0	17.0	34.4	34.4						32.6	32.6	
Actuated g/C Ratio		0.23	0.23	0.46	0.46						0.43	0.43	
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0	
Vehicle Extension (s)		0.2	0.2	0.2	0.2						0.2	0.2	
Lane Grp Cap (vph)		396	337	516	802						2070	646	
v/s Ratio Prot		c0.10		0.05	c0.13								
v/s Ratio Perm			0.03	0.08							0.39	0.04	
v/c Ratio		0.45	0.15	0.27	0.29						0.89	0.10	
Uniform Delay, d1		25.0	23.2	12.3	12.7						19.6	12.5	
Progression Factor		1.00	1.00	1.12	1.15						1.06	1.46	
Incremental Delay, d2		3.7	0.9	1.1	0.8						6.0	0.3	
Delay (s)		28.7	24.1	14.9	15.3						26.8	18.5	
Level of Service		C	C	B	B						C	B	
Approach Delay (s)		26.6			15.2			0.0			26.4		
Approach LOS		C			B			A			C		
Intersection Summary													
HCM 2000 Control Delay			24.8			HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.65										
Actuated Cycle Length (s)			75.0			Sum of lost time (s)				12.0			
Intersection Capacity Utilization			63.0%			ICU Level of Service					B		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
130: 7th St & A St

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	185	0	0	195	70	160	1300	120	0	0	0
Future Volume (vph)	80	185	0	0	195	70	160	1300	120	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0				
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.99				
Satd. Flow (prot)	1662	1750			1750	1488		4661				
Flt Permitted	0.63	1.00			1.00	1.00		0.99				
Satd. Flow (perm)	1096	1750			1750	1488		4661				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	86	199	0	0	210	75	172	1398	129	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	62	0	11	0	0	0	0
Lane Group Flow (vph)	86	199	0	0	210	13	0	1688	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	custom	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	7					8	2					
Actuated Green, G (s)	8.4	23.9			11.5	11.5		43.1				
Effective Green, g (s)	8.4	23.9			11.5	11.5		43.1				
Actuated g/C Ratio	0.11	0.32			0.15	0.15		0.57				
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0				
Vehicle Extension (s)	0.2	0.2			0.2	0.2		0.2				
Lane Grp Cap (vph)	122	557			268	228		2678				
v/s Ratio Prot		0.11			c0.12							
v/s Ratio Perm	c0.08					0.01		0.36				
v/c Ratio	0.70	0.36			0.78	0.06		0.63				
Uniform Delay, d1	32.1	19.6			30.6	27.1		10.6				
Progression Factor	0.97	0.92			1.00	1.00		1.20				
Incremental Delay, d2	11.6	0.1			12.9	0.0		1.0				
Delay (s)	42.9	18.2			43.4	27.2		13.7				
Level of Service	D	B			D	C		B				
Approach Delay (s)		25.6			39.2			13.7			0.0	
Approach LOS		C			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			18.4		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			63.0%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
140: 6th St & D St


















Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔↔↔	
Traffic Volume (vph)	0	110	60	75	130	0	0	0	0	95	1710	30
Future Volume (vph)	0	110	60	75	130	0	0	0	0	95	1710	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frt		0.95			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1667			1718						4753	
Flt Permitted		1.00			0.83						1.00	
Satd. Flow (perm)		1667			1454						4753	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	120	65	82	141	0	0	0	0	103	1859	33
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	178	0	0	223	0	0	0	0	0	1993	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA						Perm	NA
Protected Phases		8			4							6
Permitted Phases				4							6	
Actuated Green, G (s)		26.0			26.0							41.0
Effective Green, g (s)		26.0			26.0							41.0
Actuated g/C Ratio		0.35			0.35							0.55
Clearance Time (s)		4.0			4.0							4.0
Vehicle Extension (s)		0.2			0.2							0.2
Lane Grp Cap (vph)		577			504							2598
v/s Ratio Prot		0.11										
v/s Ratio Perm					0.15							0.42
v/c Ratio		0.31			0.44							0.77
Uniform Delay, d1		17.9			18.9							13.3
Progression Factor		1.00			0.74							0.25
Incremental Delay, d2		1.4			2.5							1.5
Delay (s)		19.3			16.6							4.8
Level of Service		B			B							A
Approach Delay (s)		19.3			16.6			0.0				4.8
Approach LOS		B			B			A				A
Intersection Summary												
HCM 2000 Control Delay			7.0									A
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			75.0								8.0	
Intersection Capacity Utilization			70.9%									C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
150: 7th St & D St

Baseline 2018 PM Peak
12/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations								  					
Traffic Volume (vph)	30	175	0	0	150	90	65	1455	70	0	0	0	
Future Volume (vph)	30	175	0	0	150	90	65	1455	70	0	0	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0			4.0			4.0					
Lane Util. Factor		1.00			1.00			0.91					
Frt		1.00			0.95			0.99					
Flt Protected		0.99			1.00			1.00					
Satd. Flow (prot)		1737			1661			4693					
Flt Permitted		0.77			1.00			1.00					
Satd. Flow (perm)		1340			1661			4693					
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	32	188	0	0	161	97	70	1565	75	0	0	0	
RTOR Reduction (vph)	0	0	0	0	18	0	0	4	0	0	0	0	
Lane Group Flow (vph)	0	220	0	0	240	0	0	1706	0	0	0	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	
Turn Type	Perm	NA			NA		Perm	NA					
Protected Phases		8			4			2					
Permitted Phases	8						2						
Actuated Green, G (s)		14.7			14.7			52.3					
Effective Green, g (s)		14.7			14.7			52.3					
Actuated g/C Ratio		0.20			0.20			0.70					
Clearance Time (s)		4.0			4.0			4.0					
Vehicle Extension (s)		0.2			0.2			0.2					
Lane Grp Cap (vph)		262			325			3272					
v/s Ratio Prot					0.14								
v/s Ratio Perm		c0.16						0.36					
v/c Ratio		0.84			0.74			0.52					
Uniform Delay, d1		29.0			28.3			5.4					
Progression Factor		0.90			1.00			0.22					
Incremental Delay, d2		17.4			7.4			0.5					
Delay (s)		43.4			35.7			1.7					
Level of Service		D			D			A					
Approach Delay (s)		43.4			35.7			1.7			0.0		
Approach LOS		D			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			9.9				HCM 2000 Level of Service		A				
HCM 2000 Volume to Capacity ratio			0.59										
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		8.0				
Intersection Capacity Utilization			70.0%				ICU Level of Service		C				
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
160: 6th St & E St













Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	305	360	0	0	0	0	0	1810	125
Future Volume (vph)	0	0	0	305	360	0	0	0	0	0	1810	125
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)				4.0	4.0						4.0	
Lane Util. Factor				0.91	0.91						0.91	
Frt				1.00	1.00						0.99	
Flt Protected				0.95	0.99						1.00	
Satd. Flow (prot)				1513	3154						4731	
Flt Permitted				0.95	0.99						1.00	
Satd. Flow (perm)				1513	3154						4731	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	335	396	0	0	0	0	0	1989	137
RTOR Reduction (vph)	0	0	0	10	10	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	228	483	0	0	0	0	0	2116	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA							NA
Protected Phases					8							6
Permitted Phases				8								
Actuated Green, G (s)				26.0	26.0						41.0	
Effective Green, g (s)				26.0	26.0						41.0	
Actuated g/C Ratio				0.35	0.35						0.55	
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				0.2	0.2						0.2	
Lane Grp Cap (vph)				524	1093						2586	
v/s Ratio Prot											c0.45	
v/s Ratio Perm				0.15	0.15							
v/c Ratio				0.44	0.44						0.82	
Uniform Delay, d1				18.9	18.9						13.9	
Progression Factor				0.66	0.67						0.40	
Incremental Delay, d2				2.2	1.1						2.1	
Delay (s)				14.6	13.8						7.7	
Level of Service				B	B						A	
Approach Delay (s)		0.0			14.0			0.0			7.7	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.3		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)			8.0				
Intersection Capacity Utilization			61.3%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												













HCM Signalized Intersection Capacity Analysis
170: 7th St & E St

Baseline 2018 PM Peak
12/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑		↵	↑↑↑					
Traffic Volume (vph)	0	0	0	0	505	205	175	1370	0	0	0	0	
Future Volume (vph)	0	0	0	0	505	205	175	1370	0	0	0	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)					4.0		4.0	4.0					
Lane Util. Factor					0.95		0.86	0.86					
Frt					0.96		1.00	1.00					
Flt Protected					1.00		0.95	1.00					
Satd. Flow (prot)					3163		1430	4468					
Flt Permitted					1.00		0.95	1.00					
Satd. Flow (perm)					3163		1430	4468					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	549	223	190	1489	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	20	0	52	6	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	752	0	119	1502	0	0	0	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%	
Turn Type					NA		Perm	NA					
Protected Phases					8			2					
Permitted Phases							2						
Actuated Green, G (s)					20.8		46.2	46.2					
Effective Green, g (s)					20.8		46.2	46.2					
Actuated g/C Ratio					0.28		0.62	0.62					
Clearance Time (s)					4.0		4.0	4.0					
Vehicle Extension (s)					0.2		0.2	0.2					
Lane Grp Cap (vph)					877		880	2752					
v/s Ratio Prot					c0.24								
v/s Ratio Perm							0.08	0.34					
v/c Ratio					0.86		0.14	0.55					
Uniform Delay, d1					25.7		6.0	8.3					
Progression Factor					1.00		0.24	0.45					
Incremental Delay, d2					8.0		0.3	0.7					
Delay (s)					33.7		1.7	4.4					
Level of Service					C		A	A					
Approach Delay (s)		0.0			33.7			4.1			0.0		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			75.0		Sum of lost time (s)				8.0				
Intersection Capacity Utilization			61.3%		ICU Level of Service				B				
Analysis Period (min)			15										
c Critical Lane Group													













HCM Signalized Intersection Capacity Analysis
180: 6th St & F St

Baseline 2018 PM Peak
12/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑								↘	↑↑↑		
Traffic Volume (vph)	0	280	120	0	0	0	0	0	0	200	1910	0	
Future Volume (vph)	0	280	120	0	0	0	0	0	0	200	1910	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0								4.0	4.0		
Lane Util. Factor		0.95								1.00	0.91		
Frt		0.95								1.00	1.00		
Flt Protected		1.00								0.95	1.00		
Satd. Flow (prot)		3175								1646	4778		
Flt Permitted		1.00								0.95	1.00		
Satd. Flow (perm)		3175								1646	4778		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	301	129	0	0	0	0	0	0	215	2054	0	
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	105	0	0	
Lane Group Flow (vph)	0	426	0	0	0	0	0	0	0	110	2054	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	
Turn Type		NA								Perm	NA		
Protected Phases		4									6		
Permitted Phases										6			
Actuated Green, G (s)		28.8								38.2	38.2		
Effective Green, g (s)		28.8								38.2	38.2		
Actuated g/C Ratio		0.38								0.51	0.51		
Clearance Time (s)		4.0								4.0	4.0		
Vehicle Extension (s)		0.2								0.2	0.2		
Lane Grp Cap (vph)		1219								838	2433		
v/s Ratio Prot		c0.13									c0.43		
v/s Ratio Perm										0.07			
v/c Ratio		0.35								0.13	0.84		
Uniform Delay, d1		16.4								9.7	15.8		
Progression Factor		1.00								0.27	0.63		
Incremental Delay, d2		0.8								0.2	2.4		
Delay (s)		17.2								2.8	12.4		
Level of Service		B								A	B		
Approach Delay (s)		17.2			0.0			0.0			11.5		
Approach LOS		B			A			A			B		
Intersection Summary													
HCM 2000 Control Delay			12.4		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.63										
Actuated Cycle Length (s)			75.0		Sum of lost time (s)					8.0			
Intersection Capacity Utilization			61.3%		ICU Level of Service					B			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
190: 7th St & F St

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↔↔↔				
Traffic Volume (vph)	105	400	0	0	0	0	0	1440	165	0	0	0
Future Volume (vph)	105	400	0	0	0	0	0	1440	165	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						0.91				
Frt		1.00						0.98				
Flt Protected		0.99						1.00				
Satd. Flow (prot)		3265						4704				
Flt Permitted		0.99						1.00				
Satd. Flow (perm)		3265						4704				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	444	0	0	0	0	0	1600	183	0	0	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	545	0	0	0	0	0	1770	0	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		4						6				
Permitted Phases	4											
Actuated Green, G (s)		16.4						50.6				
Effective Green, g (s)		16.4						50.6				
Actuated g/C Ratio		0.22						0.67				
Clearance Time (s)		4.0						4.0				
Vehicle Extension (s)		0.2						0.2				
Lane Grp Cap (vph)		713						3173				
v/s Ratio Prot								c0.38				
v/s Ratio Perm		0.17										
v/c Ratio		0.76						0.56				
Uniform Delay, d1		27.5						6.4				
Progression Factor		0.91						0.40				
Incremental Delay, d2		4.3						0.7				
Delay (s)		29.3						3.2				
Level of Service		C						A				
Approach Delay (s)		29.3			0.0			3.2			0.0	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.5					HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.0					Sum of lost time (s)			8.0	
Intersection Capacity Utilization			56.2%					ICU Level of Service			B	
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
200: 6th St & G St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗					↖	↑↑↑	↗
Traffic Volume (vph)	0	165	105	50	200	0	0	0	0	100	1820	135
Future Volume (vph)	0	165	105	50	200	0	0	0	0	100	1820	135
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		1.00			1.00					1.00	0.91	1.00
Frt		0.95			1.00					1.00	1.00	0.85
Flt Protected		1.00			0.99					0.95	1.00	1.00
Satd. Flow (prot)		1658			1733					1662	4778	1488
Flt Permitted		1.00			0.89					0.95	1.00	1.00
Satd. Flow (perm)		1658			1563					1662	4778	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	174	111	53	211	0	0	0	0	105	1916	142
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	73
Lane Group Flow (vph)	0	280	0	0	264	0	0	0	0	105	1916	69
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		8			4						6	
Permitted Phases				4						6		6
Actuated Green, G (s)		30.4			30.4					36.6	36.6	36.6
Effective Green, g (s)		30.4			30.4					36.6	36.6	36.6
Actuated g/C Ratio		0.41			0.41					0.49	0.49	0.49
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		0.2			0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		672			633					811	2331	726
v/s Ratio Prot		0.17									c0.40	
v/s Ratio Perm					c0.17					0.06		0.05
v/c Ratio		0.42			0.42					0.13	0.82	0.10
Uniform Delay, d1		16.0			16.0					10.5	16.4	10.3
Progression Factor		1.00			1.07					0.19	0.28	0.06
Incremental Delay, d2		1.9			2.0					0.2	2.2	0.2
Delay (s)		17.8			19.0					2.2	6.8	0.7
Level of Service		B			B					A	A	A
Approach Delay (s)		17.8			19.0			0.0			6.2	
Approach LOS		B			B			A			A	

Intersection Summary

HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
210: 7th St & G St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑			↑	↗	↘	↑↑↑				
Traffic Volume (vph)	100	170	0	0	120	90	135	1380	50	0	0	0
Future Volume (vph)	100	170	0	0	120	90	135	1380	50	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.91				
Frt	1.00	1.00			1.00	0.85	1.00	0.99				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1662	1750			1750	1488	1662	4752				
Flt Permitted	0.64	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1128	1750			1750	1488	1662	4752				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	108	183	0	0	129	97	145	1484	54	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	22	0	3	0	0	0	0
Lane Group Flow (vph)	108	183	0	0	129	75	145	1535	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8					4	2					
Actuated Green, G (s)	14.8	14.8			14.8	14.8	52.2	52.2				
Effective Green, g (s)	14.8	14.8			14.8	14.8	52.2	52.2				
Actuated g/C Ratio	0.20	0.20			0.20	0.20	0.70	0.70				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	222	345			345	293	1156	3307				
v/s Ratio Prot		c0.10			0.07			c0.32				
v/s Ratio Perm	0.10					0.05	0.09					
v/c Ratio	0.49	0.53			0.37	0.25	0.13	0.46				
Uniform Delay, d1	26.7	27.0			26.1	25.4	3.8	5.1				
Progression Factor	0.88	0.92			1.00	1.00	0.24	0.28				
Incremental Delay, d2	1.6	1.5			0.7	0.5	0.2	0.4				
Delay (s)	25.1	26.3			26.8	25.9	1.1	1.9				
Level of Service	C	C			C	C	A	A				
Approach Delay (s)		25.8			26.4			1.8			0.0	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.5		HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)			8.0				
Intersection Capacity Utilization			56.8%		ICU Level of Service			B				
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
220: 6th St & J St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔						↔↔↔		
Traffic Volume (vph)	0	30	50	40	40	0	0	0	0	30	1945	35	
Future Volume (vph)	0	30	50	40	40	0	0	0	0	30	1945	35	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0			4.0						4.0		
Lane Util. Factor		1.00			1.00						0.91		
Frt		0.92			1.00						1.00		
Flt Protected		1.00			0.98						1.00		
Satd. Flow (prot)		1602			1707						4762		
Flt Permitted		1.00			0.86						1.00		
Satd. Flow (perm)		1602			1501						4762		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	33	55	44	44	0	0	0	0	33	2137	38	
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	2	0	
Lane Group Flow (vph)	0	85	0	0	88	0	0	0	0	0	2206	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type		NA		Perm	NA						Perm	NA	
Protected Phases		8			4							6	
Permitted Phases				4							6		
Actuated Green, G (s)		28.0			28.0						39.0		
Effective Green, g (s)		28.0			28.0						39.0		
Actuated g/C Ratio		0.37			0.37						0.52		
Clearance Time (s)		4.0			4.0						4.0		
Vehicle Extension (s)		0.2			0.2						0.2		
Lane Grp Cap (vph)		598			560						2476		
v/s Ratio Prot		0.05											
v/s Ratio Perm					0.06							0.46	
v/c Ratio		0.14			0.16							0.89	
Uniform Delay, d1		15.6			15.6							16.1	
Progression Factor		1.00			0.82							0.56	
Incremental Delay, d2		0.5			0.6							4.0	
Delay (s)		16.0			13.4							13.0	
Level of Service		B			B							B	
Approach Delay (s)		16.0			13.4			0.0				13.0	
Approach LOS		B			B			A				B	
Intersection Summary													
HCM 2000 Control Delay			13.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.58										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			60.3%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
230: 7th St & J St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗			↖↗↘				
Traffic Volume (vph)	30	20	0	0	60	25	20	1525	10	0	0	0
Future Volume (vph)	30	20	0	0	60	25	20	1525	10	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.91				
Frt		1.00			0.96			1.00				
Flt Protected		0.97			1.00			1.00				
Satd. Flow (prot)		1699			1681			4770				
Flt Permitted		0.78			1.00			1.00				
Satd. Flow (perm)		1356			1681			4770				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	33	22	0	0	66	27	22	1676	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	55	0	0	78	0	0	1709	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8						2					
Actuated Green, G (s)		8.8			8.8			58.2				
Effective Green, g (s)		8.8			8.8			58.2				
Actuated g/C Ratio		0.12			0.12			0.78				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		159			197			3701				
v/s Ratio Prot					c0.05							
v/s Ratio Perm		0.04						0.36				
v/c Ratio		0.35			0.40			0.46				
Uniform Delay, d1		30.5			30.6			2.9				
Progression Factor		0.84			1.00			0.42				
Incremental Delay, d2		0.4			0.5			0.3				
Delay (s)		26.0			31.1			1.6				
Level of Service		C			C			A				
Approach Delay (s)		26.0			31.1			1.6			0.0	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			3.8				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		8.0			
Intersection Capacity Utilization			49.0%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
240: 6th St & M St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	190	465	215	685	0	0	0	0	115	1970	145
Future Volume (vph)	0	190	465	215	685	0	0	0	0	115	1970	145
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						1.00	1.00
Satd. Flow (prot)		1733	1488	1662	1750						4764	1488
Flt Permitted		1.00	1.00	0.95	1.00						1.00	1.00
Satd. Flow (perm)		1733	1488	1662	1750						4764	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	200	489	226	721	0	0	0	0	121	2074	153
RTOR Reduction (vph)	0	0	73	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	200	416	226	721	0	0	0	0	0	2195	101
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA	Prot	Prot	NA					Perm	NA	Perm
Protected Phases		4	4	3	8						6	
Permitted Phases										6		6
Actuated Green, G (s)		10.8	10.8	16.0	30.8						36.2	36.2
Effective Green, g (s)		10.8	10.8	16.0	30.8						36.2	36.2
Actuated g/C Ratio		0.14	0.14	0.21	0.41						0.48	0.48
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		0.2	0.2	2.5	0.2						0.2	0.2
Lane Grp Cap (vph)		249	214	354	718						2299	718
v/s Ratio Prot		0.12	c0.28	0.14	c0.41							
v/s Ratio Perm											0.46	0.07
v/c Ratio		0.80	1.95	0.64	1.00						0.95	0.14
Uniform Delay, d1		31.1	32.1	26.9	22.1						18.6	10.8
Progression Factor		1.00	1.00	1.08	1.12						0.70	0.41
Incremental Delay, d2		16.0	441.9	2.2	28.3						7.3	0.2
Delay (s)		47.1	474.0	31.1	53.0						20.4	4.6
Level of Service		D	F	C	D						C	A
Approach Delay (s)		350.1			47.8			0.0			19.3	
Approach LOS		F			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			83.3			HCM 2000 Level of Service					F	
HCM 2000 Volume to Capacity ratio			1.18									
Actuated Cycle Length (s)			75.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			98.1%			ICU Level of Service					F	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
250: 7th St & M St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑	↗		↖↖↖	↗			
Traffic Volume (vph)	2	285	0	0	430	125	465	1355	135	0	0	0
Future Volume (vph)	2	285	0	0	430	125	465	1355	135	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor		1.00			1.00	1.00		0.91	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		1732			1750	1488		4717	1488			
Flt Permitted		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		1729			1750	1488		4717	1488			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	310	0	0	467	136	505	1473	147	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	20	0	0	59	0	0	0
Lane Group Flow (vph)	0	312	0	0	467	116	0	1978	88	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA	Perm			
Protected Phases		8			4			2				
Permitted Phases	8					4	2		2			
Actuated Green, G (s)		22.2			22.2	22.2		44.8	44.8			
Effective Green, g (s)		22.2			22.2	22.2		44.8	44.8			
Actuated g/C Ratio		0.30			0.30	0.30		0.60	0.60			
Clearance Time (s)		4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)		0.2			0.2	0.2		0.2	0.2			
Lane Grp Cap (vph)		511			518	440		2817	888			
v/s Ratio Prot					c0.27							
v/s Ratio Perm		0.18				0.08		0.42	0.06			
v/c Ratio		0.61			0.90	0.26		0.70	0.10			
Uniform Delay, d1		22.7			25.4	20.2		10.5	6.5			
Progression Factor		0.90			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.8			18.4	0.1		1.5	0.2			
Delay (s)		21.3			43.8	20.3		12.0	6.7			
Level of Service		C			D	C		B	A			
Approach Delay (s)		21.3			38.5			11.6			0.0	
Approach LOS		C			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			17.9				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		8.0			
Intersection Capacity Utilization			73.5%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 260: 6th St & OR 99 EB & Park St

Baseline 2018 PM Peak
 12/05/2018



Movement	EBT	EBR	EBR2	WBL2	WBL	WBT	SBL2	SBL	SBT	SBR
Lane Configurations	↑	↔				↔		↔	↑↑↑	
Traffic Volume (vph)	205	40	30	10	60	35	105	370	1630	160
Future Volume (vph)	205	40	30	10	60	35	105	370	1630	160
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0				5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00				1.00		0.86	0.86	
Frt	1.00	0.85				1.00		1.00	0.99	
Flt Protected	1.00	1.00				0.97		0.95	1.00	
Satd. Flow (prot)	1733	1488				1677		1408	4450	
Flt Permitted	1.00	1.00				0.97		0.95	1.00	
Satd. Flow (perm)	1733	1488				1677		1408	4450	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	42	32	11	63	37	111	389	1716	168
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	8	0
Lane Group Flow (vph)	216	74	0	0	0	111	0	461	1915	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	3%	0%	2%	0%	0%
Turn Type	NA	Prot		Split	Split	NA	Split	Split	NA	
Protected Phases	8	8		7	7	7	5	5	5	
Permitted Phases										
Actuated Green, G (s)	14.8	14.8				11.6		56.7	56.7	
Effective Green, g (s)	14.8	14.8				11.6		56.7	56.7	
Actuated g/C Ratio	0.15	0.15				0.12		0.58	0.58	
Clearance Time (s)	5.0	5.0				5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0				2.0		3.0	3.0	
Lane Grp Cap (vph)	261	224				198		813	2572	
v/s Ratio Prot	c0.12	0.05				c0.07		0.33	c0.43	
v/s Ratio Perm										
v/c Ratio	0.83	0.33				0.56		0.57	0.74	
Uniform Delay, d1	40.4	37.2				40.8		13.0	15.3	
Progression Factor	1.00	1.00				1.00		1.00	1.00	
Incremental Delay, d2	18.1	0.3				2.2		0.9	1.2	
Delay (s)	58.5	37.5				43.0		13.9	16.5	
Level of Service	E	D				D		B	B	
Approach Delay (s)	53.2					43.0			16.0	
Approach LOS	D					D			B	
Intersection Summary										
HCM 2000 Control Delay			21.0			HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.73							
Actuated Cycle Length (s)			98.1			Sum of lost time (s)			15.0	
Intersection Capacity Utilization			67.3%			ICU Level of Service			C	
Analysis Period (min)			15							
c	Critical Lane Group									

HCM Signalized Intersection Capacity Analysis
270: 7th St & OR 99 WB & Park St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	NWL	NWR	NWR2
Lane Configurations										
Traffic Volume (vph)	215	140	80	115	60	1350	25	20	270	10
Future Volume (vph)	215	140	80	115	60	1350	25	20	270	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00		0.95		1.00	0.95	
Frt	1.00	1.00	1.00	0.85		1.00		0.87	0.85	
Flt Protected	0.95	1.00	1.00	1.00		1.00		0.99	1.00	
Satd. Flow (prot)	1662	1750	1750	1488		3309		1512	1413	
Flt Permitted	0.69	1.00	1.00	1.00		1.00		0.99	1.00	
Satd. Flow (perm)	1203	1750	1750	1488		3309		1512	1413	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	229	149	85	122	64	1436	27	21	287	11
RTOR Reduction (vph)	0	0	0	95	0	0	0	0	0	0
Lane Group Flow (vph)	229	149	85	27	0	1527	0	162	157	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	Perm	Split	NA		Prot	Prot	
Protected Phases		4	8		6	6		5	5	
Permitted Phases	4			8						
Actuated Green, G (s)	26.0	26.0	26.0	26.0		60.6		17.9	17.9	
Effective Green, g (s)	26.0	26.0	26.0	26.0		61.1		18.4	18.4	
Actuated g/C Ratio	0.22	0.22	0.22	0.22		0.52		0.16	0.16	
Clearance Time (s)	4.0	4.0	4.0	4.0		4.5		4.5	4.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		4.2		4.2	4.2	
Lane Grp Cap (vph)	266	387	387	329		1720		236	221	
v/s Ratio Prot		0.09	0.05			c0.46		0.11	c0.11	
v/s Ratio Perm	c0.19			0.02						
v/c Ratio	0.86	0.39	0.22	0.08		0.89		0.69	0.71	
Uniform Delay, d1	44.0	38.9	37.4	36.3		25.1		46.8	47.0	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	23.4	0.5	0.2	0.1		6.2		8.9	11.2	
Delay (s)	67.4	39.4	37.7	36.4		31.3		55.8	58.2	
Level of Service	E	D	D	D		C		E	E	
Approach Delay (s)		56.4	36.9			31.3		57.0		
Approach LOS		E	D			C		E		

Intersection Summary

HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
280: Parkdale Dr & OR 99

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	180	30	150	230	45	35	360	120	60	460	85
Future Volume (vph)	55	180	30	150	230	45	35	360	120	60	460	85
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1750	1488	1662	1750	1488	1662	1684		1630	1709	
Flt Permitted	0.61	1.00	1.00	0.64	1.00	1.00	0.32	1.00		0.38	1.00	
Satd. Flow (perm)	1062	1750	1488	1121	1750	1488	553	1684		647	1709	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	57	186	31	155	237	46	36	371	124	62	474	88
RTOR Reduction (vph)	0	0	21	0	0	31	0	14	0	0	8	0
Lane Group Flow (vph)	57	186	10	155	237	15	36	481	0	62	554	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8				4
Permitted Phases	6		6	2		2	8			4		
Actuated Green, G (s)	13.0	13.0	13.0	13.0	13.0	13.0	18.5	18.5		18.5	18.5	
Effective Green, g (s)	13.5	13.5	13.5	13.5	13.5	13.5	19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.47	0.47		0.47	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	354	583	496	373	583	496	259	790		303	801	
v/s Ratio Prot		0.11			0.14			0.29				c0.32
v/s Ratio Perm	0.05		0.01	c0.14		0.01	0.07			0.10		
v/c Ratio	0.16	0.32	0.02	0.42	0.41	0.03	0.14	0.61		0.20	0.69	
Uniform Delay, d1	9.5	10.1	9.1	10.4	10.4	9.1	6.1	8.0		6.3	8.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3	0.0	0.8	0.5	0.0	0.2	1.1		0.2	2.4	
Delay (s)	9.7	10.4	9.1	11.2	10.9	9.1	6.3	9.1		6.6	10.8	
Level of Service	A	B	A	B	B	A	A	A		A	B	
Approach Delay (s)		10.1			10.8			8.9			10.4	
Approach LOS		B			B			A			B	

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑		↑	↑	↑	
Traffic Vol, veh/h	490	55	5	405	35	5
Future Vol, veh/h	490	55	5	405	35	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	557	63	6	460	40	6

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	620	0	1061 589
Stage 1	-	-	-	-	589 -
Stage 2	-	-	-	-	472 -
Critical Hdwy	-	-	4.1	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.2	-	3.5 3.3
Pot Cap-1 Maneuver	-	-	970	-	250 512
Stage 1	-	-	-	-	558 -
Stage 2	-	-	-	-	632 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	970	-	249 512
Mov Cap-2 Maneuver	-	-	-	-	382 -
Stage 1	-	-	-	-	555 -
Stage 2	-	-	-	-	632 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	395	-	-	970	-
HCM Lane V/C Ratio	0.115	-	-	0.006	-
HCM Control Delay (s)	15.3	-	-	8.7	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑		↑
Traffic Vol, veh/h	590	5	2	840	0	35
Future Vol, veh/h	590	5	2	840	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	275	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	0	0	1	0	0
Mvmt Flow	608	5	2	866	0	36

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	613	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	2.2	-	-
Pot Cap-1 Maneuver	-	-	976	-	0
Stage 1	-	-	-	-	0
Stage 2	-	-	-	-	0
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	976	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	976	-
HCM Lane V/C Ratio	0.052	-	-	0.002	-
HCM Control Delay (s)	10.4	-	-	8.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

HCM Signalized Intersection Capacity Analysis
310: Hubbard Ln & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	540	5	25	765	75	5	10	10	20	10	10
Future Volume (vph)	10	540	5	25	765	75	5	10	10	20	10	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3228	1488	1583	3292	1488	1250	1619		1568	1619	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00		0.74	1.00	
Satd. Flow (perm)	1662	3228	1488	1583	3292	1488	979	1619		1229	1619	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	562	5	26	797	78	5	10	10	21	10	10
RTOR Reduction (vph)	0	0	2	0	0	31	0	9	0	0	9	0
Lane Group Flow (vph)	10	563	3	26	797	47	5	11	0	21	11	0
Heavy Vehicles (%)	0%	3%	0%	5%	1%	0%	33%	0%	0%	6%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8				4
Permitted Phases			6			2	8			4		
Actuated Green, G (s)	0.7	27.6	27.6	0.8	27.7	27.7	5.5	5.5		5.5	5.5	
Effective Green, g (s)	0.7	29.6	29.6	0.8	29.7	29.7	6.5	6.5		6.5	6.5	
Actuated g/C Ratio	0.01	0.61	0.61	0.02	0.61	0.61	0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	23	1953	900	25	1999	903	130	215		163	215	
v/s Ratio Prot	0.01	0.17		c0.02	c0.24			0.01				0.01
v/s Ratio Perm			0.00			0.03	0.01			c0.02		
v/c Ratio	0.43	0.29	0.00	1.04	0.40	0.05	0.04	0.05		0.13	0.05	
Uniform Delay, d1	23.9	4.6	3.8	24.1	5.0	3.9	18.5	18.5		18.7	18.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.6	0.1	0.0	192.8	0.1	0.0	0.1	0.1		0.4	0.1	
Delay (s)	36.5	4.7	3.8	216.8	5.1	3.9	18.6	18.6		19.1	18.6	
Level of Service	D	A	A	F	A	A	B	B		B	B	
Approach Delay (s)		5.2			11.1			18.6			18.8	
Approach LOS		A			B			B			B	

Intersection Summary

HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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	0	570	10	275	850	80	0	0	0	0	0	20
Future Vol, veh/h	0	570	10	275	850	80	0	0	0	0	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	315	200	-	275	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	0	620	11	299	924	87	0	0	0	0	0	22

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	631	0	0	-	-	462
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.1	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.2	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	961	-	-	0	0	552
Stage 1	0	-	-	-	-	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	961	-	-	-	0	552
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.4	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	961	-	-	552
HCM Lane V/C Ratio	-	-	0.311	-	-	0.039
HCM Control Delay (s)	-	-	10.4	-	-	11.8
HCM Lane LOS	-	-	B	-	-	B
HCM 95th %tile Q(veh)	-	-	1.3	-	-	0.1

HCM Signalized Intersection Capacity Analysis
330: Dowell Rd & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	660	20	160	1070	170	45	40	130	105	55	65
Future Volume (vph)	45	660	20	160	1070	170	45	40	130	105	55	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3260	1403	1662	3260	1488	1662	1549		1646	1608	
Flt Permitted	0.23	1.00	1.00	0.30	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	407	3260	1403	522	3260	1488	1662	1549		1646	1608	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	49	725	22	176	1176	187	49	44	143	115	60	71
RTOR Reduction (vph)	0	0	14	0	0	116	0	112	0	0	50	0
Lane Group Flow (vph)	49	725	8	176	1176	71	49	75	0	115	81	0
Heavy Vehicles (%)	0%	2%	6%	0%	2%	0%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	17.2	17.2	17.2	17.2	17.2	17.2	2.6	9.7		6.4	13.5	
Effective Green, g (s)	17.2	17.2	17.2	17.2	17.2	17.2	2.6	9.7		6.4	13.5	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.38	0.06	0.21		0.14	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	154	1237	532	198	1237	564	95	331		232	479	
v/s Ratio Prot		0.22			c0.36		0.03	c0.05		c0.07	c0.05	
v/s Ratio Perm	0.12		0.01	0.34		0.05						
v/c Ratio	0.32	0.59	0.02	0.89	0.95	0.13	0.52	0.23		0.50	0.17	
Uniform Delay, d1	9.9	11.2	8.8	13.2	13.6	9.2	20.7	14.7		18.0	11.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.6	0.0	34.6	15.3	0.1	3.5	0.3		1.2	0.1	
Delay (s)	10.8	11.8	8.8	47.7	28.9	9.2	24.2	15.0		19.2	11.9	
Level of Service	B	B	A	D	C	A	C	B		B	B	
Approach Delay (s)		11.7			28.7			16.9			15.3	
Approach LOS		B			C			B			B	

Intersection Summary

HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
340: Allen Creek Rd & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑	↗	↙	↑↑	↗	↙↗	↑		↙	↗	
Traffic Volume (vph)	5	690	195	295	1005	5	405	15	170	5	105	10
Future Volume (vph)	5	690	195	295	1005	5	405	15	170	5	105	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3292	1430	1662	3292	1488	3225	1509		1662	1727	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3292	1430	1662	3292	1488	3225	1509		1662	1727	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	5	742	210	317	1081	5	435	16	183	5	113	11
RTOR Reduction (vph)	0	0	138	0	0	2	0	127	0	0	3	0
Lane Group Flow (vph)	5	742	72	317	1081	3	435	72	0	5	121	0
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2						
Actuated Green, G (s)	1.3	39.1	39.1	23.1	60.9	60.9	19.6	35.5		1.3	17.2	
Effective Green, g (s)	2.3	41.1	41.1	24.1	62.9	62.9	20.6	36.5		2.3	18.2	
Actuated g/C Ratio	0.02	0.34	0.34	0.20	0.52	0.52	0.17	0.30		0.02	0.15	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	31	1127	489	333	1725	779	553	458		31	261	
v/s Ratio Prot	0.00	0.23		c0.19	c0.33		c0.13	0.05		0.00	c0.07	
v/s Ratio Perm			0.05			0.00						
v/c Ratio	0.16	0.66	0.15	0.95	0.63	0.00	0.79	0.16		0.16	0.46	
Uniform Delay, d1	57.9	33.5	27.3	47.4	20.2	13.6	47.6	30.5		57.9	46.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	3.0	0.6	36.6	1.7	0.0	7.0	0.1		1.8	0.9	
Delay (s)	59.7	36.5	27.9	84.0	22.0	13.6	54.6	30.6		59.7	47.4	
Level of Service	E	D	C	F	C	B	D	C		E	D	
Approach Delay (s)		34.8			35.9			47.1			47.9	
Approach LOS		C			D			D			D	

Intersection Summary

HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑				↑			↑
Traffic Vol, veh/h	0	1340	130	0	2090	20	0	0	85	0	0	2
Future Vol, veh/h	0	1340	130	0	2090	20	0	0	85	0	0	2
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	-	-	275	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1381	134	0	2155	21	0	0	88	0	0	2

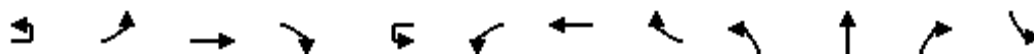
Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	-	-	0	-	-	691	-	-	1088
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	387	0	0	211
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	387	-	-	211
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	17	22.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	387	-	-	-	-	211
HCM Lane V/C Ratio	0.226	-	-	-	-	0.01
HCM Control Delay (s)	17	-	-	-	-	22.2
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.9	-	-	-	-	0

HCM Signalized Intersection Capacity Analysis
360: Ringuette St & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	75	1260	50	15	145	1895	20	190	70	225	15
Future Volume (vph)	5	75	1260	50	15	145	1895	20	190	70	225	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		0.95	0.95	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	0.98	1.00	0.95
Satd. Flow (prot)		1662	3260	1458		1662	3287		1579	1624	1473	1662
Flt Permitted		0.06	1.00	1.00		0.11	1.00		0.95	0.98	1.00	0.95
Satd. Flow (perm)		104	3260	1458		189	3287		1579	1624	1473	1662
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	77	1299	52	15	149	1954	21	196	72	232	15
RTOR Reduction (vph)	0	0	0	24	0	0	0	0	0	0	207	0
Lane Group Flow (vph)	0	82	1299	28	0	164	1975	0	131	137	25	15
Heavy Vehicles (%)	0%	0%	2%	2%	0%	0%	1%	0%	0%	0%	1%	0%
Turn Type	Prot	pm+pt	NA	Perm	Prot	pm+pt	NA		Split	NA	Perm	Split
Protected Phases	1	1	6		5	5	2		8	8		4
Permitted Phases		6		6		2					8	
Actuated Green, G (s)		73.2	66.5	66.5		83.2	71.5		13.2	13.2	13.2	14.6
Effective Green, g (s)		75.2	67.5	67.5		84.2	72.5		13.7	13.7	13.7	15.1
Actuated g/C Ratio		0.60	0.54	0.54		0.67	0.58		0.11	0.11	0.11	0.12
Clearance Time (s)		5.0	5.0	5.0		5.0	5.0		4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.5	4.5	4.5		2.5	4.5		2.5	2.5	2.5	2.8
Lane Grp Cap (vph)		158	1760	787		276	1906		173	177	161	200
v/s Ratio Prot		0.03	0.40			c0.06	c0.60		0.08	c0.08		0.01
v/s Ratio Perm		0.28		0.02		0.34					0.02	
v/c Ratio		0.52	0.74	0.04		0.59	1.04		0.76	0.77	0.16	0.07
Uniform Delay, d1		27.1	22.0	13.5		16.3	26.2		54.0	54.1	50.4	48.8
Progression Factor		1.00	1.00	1.00		1.01	0.92		1.00	1.00	1.00	1.00
Incremental Delay, d2		2.1	2.8	0.1		2.1	27.9		16.4	18.1	0.3	0.1
Delay (s)		29.3	24.8	13.6		18.5	52.0		70.4	72.2	50.8	48.9
Level of Service		C	C	B		B	D		E	E	D	D
Approach Delay (s)			24.7			49.5			61.8			
Approach LOS			C			D			E			
Intersection Summary												
HCM 2000 Control Delay			43.5			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			125.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			95.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												



Movement	SBT	SBR
Lane Configurations	↶	
Traffic Volume (vph)	65	130
Future Volume (vph)	65	130
Ideal Flow (vphpl)	1750	1750
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frt	0.90	
Flt Protected	1.00	
Satd. Flow (prot)	1575	
Flt Permitted	1.00	
Satd. Flow (perm)	1575	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	67	134
RTOR Reduction (vph)	59	0
Lane Group Flow (vph)	142	0
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	14.6	
Effective Green, g (s)	15.1	
Actuated g/C Ratio	0.12	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.8	
Lane Grp Cap (vph)	190	
v/s Ratio Prot	c0.09	
v/s Ratio Perm		
v/c Ratio	0.75	
Uniform Delay, d1	53.1	
Progression Factor	1.00	
Incremental Delay, d2	14.5	
Delay (s)	67.6	
Level of Service	E	
Approach Delay (s)	66.3	
Approach LOS	E	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
380: OR 238/6th St & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	730	25	480	1020	5	100	15	295	0	960	1015
Future Volume (vph)	10	730	25	480	1020	5	100	15	295	0	960	1015
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.86			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1471	3122		3162	3226		1614	1458			3292	1473
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	1471	3122		3162	3226		1614	1458			3292	1473
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	745	26	490	1041	5	102	15	301	0	980	1036
RTOR Reduction (vph)	0	2	0	0	0	0	0	164	0	0	0	0
Lane Group Flow (vph)	10	769	0	490	1046	0	102	152	0	0	980	1036
Heavy Vehicles (%)	13%	6%	5%	2%	3%	0%	3%	0%	3%	0%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA			NA	Free
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases												Free
Actuated Green, G (s)	1.5	48.3		10.0	56.8		11.6	51.7			35.1	125.0
Effective Green, g (s)	2.5	49.3		11.0	57.8		12.6	52.7			36.1	125.0
Actuated g/C Ratio	0.02	0.39		0.09	0.46		0.10	0.42			0.29	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)	2.5	4.3		2.5	4.3		2.5	2.5			2.5	
Lane Grp Cap (vph)	29	1231		278	1491		162	614			950	1473
v/s Ratio Prot	0.01	0.25		c0.15	0.32		0.06	0.10			c0.30	
v/s Ratio Perm												c0.70
v/c Ratio	0.34	0.62		1.76	0.70		0.63	0.25			1.03	0.70
Uniform Delay, d1	60.4	30.4		57.0	26.7		54.0	23.3			44.5	0.0
Progression Factor	0.95	1.09		0.91	0.70		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.9	1.8		353.8	2.1		6.5	0.2			37.6	2.8
Delay (s)	61.5	35.0		405.7	20.9		60.4	23.5			82.1	2.8
Level of Service	E	D		F	C		E	C			F	A
Approach Delay (s)		35.4			143.6			32.5			41.3	
Approach LOS		D			F			C			D	

Intersection Summary		
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.97	
Actuated Cycle Length (s)	125.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	85.8%	ICU Level of Service E
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
390: OR 99 EB & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑						↑↑	
Traffic Volume (vph)	0	855	175	0	1485	0	0	0	0	50	425	45
Future Volume (vph)	0	855	175	0	1485	0	0	0	0	50	425	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0						5.0	
Lane Util. Factor		0.95			0.95						0.95	
Frt		0.97			1.00						0.99	
Flt Protected		1.00			1.00						1.00	
Satd. Flow (prot)		3146			3260						3226	
Flt Permitted		1.00			1.00						1.00	
Satd. Flow (perm)		3146			3260						3226	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	900	184	0	1563	0	0	0	0	53	447	47
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	1076	0	0	1563	0	0	0	0	0	539	0
Heavy Vehicles (%)	0%	3%	3%	0%	2%	0%	0%	0%	0%	0%	1%	5%
Turn Type		NA			NA					Perm	NA	
Protected Phases		6			2						4	
Permitted Phases										4		
Actuated Green, G (s)		88.4			88.4						26.6	
Effective Green, g (s)		88.4			88.4						26.6	
Actuated g/C Ratio		0.71			0.71						0.21	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		4.5			4.5						2.5	
Lane Grp Cap (vph)		2224			2305						686	
v/s Ratio Prot		0.34			0.48							
v/s Ratio Perm											0.17	
v/c Ratio		0.48			0.68						0.79	
Uniform Delay, d1		8.1			10.3						46.5	
Progression Factor		0.55			1.14						1.00	
Incremental Delay, d2		0.7			1.4						5.7	
Delay (s)		5.2			13.1						52.2	
Level of Service		A			B						D	
Approach Delay (s)		5.2			13.1			0.0			52.2	
Approach LOS		A			B			A			D	
Intersection Summary												
HCM 2000 Control Delay			17.1									B
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			125.0							10.0		
Intersection Capacity Utilization			68.8%									C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
400: OR 99 WB & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↗	↘	↑↑				
Traffic Volume (vph)	0	905	0	0	1225	10	260	285	30	0	0	0
Future Volume (vph)	0	905	0	0	1225	10	260	285	30	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor		0.95			0.95	1.00	1.00	0.95				
Frt		1.00			1.00	0.85	1.00	0.99				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3228			3260	1488	1630	3183				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3228			3260	1488	1630	3183				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	953	0	0	1289	11	274	300	32	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	3	0	9	0	0	0	0
Lane Group Flow (vph)	0	953	0	0	1289	8	274	323	0	0	0	0
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	2%	2%	12%	0%	0%	0%
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		6			2			8				
Permitted Phases						2	8					
Actuated Green, G (s)		88.2			88.2	88.2	26.8	26.8				
Effective Green, g (s)		89.2			89.2	89.2	27.8	27.8				
Actuated g/C Ratio		0.71			0.71	0.71	0.22	0.22				
Clearance Time (s)		5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)		4.5			4.5	4.5	2.5	2.5				
Lane Grp Cap (vph)		2303			2326	1061	362	707				
v/s Ratio Prot		0.30			0.40			0.10				
v/s Ratio Perm						0.01	0.17					
v/c Ratio		0.41			0.55	0.01	0.76	0.46				
Uniform Delay, d1		7.3			8.5	5.2	45.4	42.1				
Progression Factor		2.06			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.5			1.0	0.0	8.3	0.3				
Delay (s)		15.5			9.4	5.2	53.8	42.4				
Level of Service		B			A	A	D	D				
Approach Delay (s)		15.5			9.4			47.5			0.0	
Approach LOS		B			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			19.5			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			125.0			Sum of lost time (s)					8.0	
Intersection Capacity Utilization			68.8%			ICU Level of Service					C	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
410: Parkdale Dr/Park St & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	870	35	500	1110	80	10	85	380	70	60	10
Future Volume (vph)	20	870	35	500	1110	80	10	85	380	70	60	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00		0.98	
Satd. Flow (prot)	1662	3260	1488	1662	3292	1488		1741	1488		1691	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.79	
Satd. Flow (perm)	1662	3260	1488	1662	3292	1488		1697	1488		1375	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	21	897	36	515	1144	82	10	88	392	72	62	10
RTOR Reduction (vph)	0	0	22	0	0	28	0	0	35	0	2	0
Lane Group Flow (vph)	21	897	14	515	1144	54	0	98	357	0	142	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			4	5		8	
Permitted Phases			6			2	4		4	8		
Actuated Green, G (s)	2.6	30.4	30.4	26.5	54.3	54.3		13.7	40.2		13.7	
Effective Green, g (s)	2.6	32.4	32.4	26.5	56.3	56.3		14.7	40.2		14.7	
Actuated g/C Ratio	0.03	0.38	0.38	0.31	0.66	0.66		0.17	0.47		0.17	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		5.0	4.0		5.0	
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7		2.5	2.5		2.5	
Lane Grp Cap (vph)	50	1233	563	514	2165	978		291	698		236	
v/s Ratio Prot	0.01	c0.28		c0.31	0.35				0.16			
v/s Ratio Perm			0.01			0.04		0.06	0.08		c0.10	
v/c Ratio	0.42	0.73	0.02	1.00	0.53	0.06		0.34	0.51		0.60	
Uniform Delay, d1	40.8	22.8	16.7	29.5	7.7	5.2		31.2	15.8		32.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	4.1	2.6	0.0	40.2	0.4	0.0		0.5	0.5		3.4	
Delay (s)	44.9	25.4	16.7	69.7	8.1	5.2		31.7	16.3		36.1	
Level of Service	D	C	B	E	A	A		C	B		D	
Approach Delay (s)		25.5			26.2			19.4			36.1	
Approach LOS		C			C			B			D	

Intersection Summary		
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.80	
Actuated Cycle Length (s)	85.6	Sum of lost time (s) 12.0
Intersection Capacity Utilization	81.1%	ICU Level of Service D
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
420: US 199 & M St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	205	200	295	160	25	110	1005	240	15	1195	185
Future Volume (vph)	145	205	200	295	160	25	110	1005	240	15	1195	185
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1614	1733	1488	3225	1714		1646	3292	1473	1662	3292	1430
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1614	1733	1488	3225	1714		1646	3292	1473	1662	3292	1430
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	154	218	213	314	170	27	117	1069	255	16	1271	197
RTOR Reduction (vph)	0	0	177	0	4	0	0	0	52	0	0	31
Lane Group Flow (vph)	154	218	36	314	193	0	117	1069	203	16	1271	166
Heavy Vehicles (%)	3%	1%	0%	0%	0%	0%	1%	1%	1%	0%	1%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases			8						6			2
Actuated Green, G (s)	14.3	18.1	18.1	14.8	18.6		12.9	58.0	72.8	2.6	47.7	62.0
Effective Green, g (s)	14.3	19.1	19.1	14.8	19.6		12.9	60.0	72.8	2.6	49.7	62.0
Actuated g/C Ratio	0.13	0.17	0.17	0.13	0.17		0.11	0.53	0.65	0.02	0.44	0.55
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	6.0	4.0	4.0	6.0	4.0
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	4.7	2.5	2.5	4.7	2.5
Lane Grp Cap (vph)	205	294	252	424	298		188	1755	953	38	1454	788
v/s Ratio Prot	0.10	c0.13		c0.10	0.11		c0.07	0.32	0.03	0.01	c0.39	0.03
v/s Ratio Perm			0.02						0.11			0.09
v/c Ratio	0.75	0.74	0.14	0.74	0.65		0.62	0.61	0.21	0.42	0.87	0.21
Uniform Delay, d1	47.4	44.4	39.7	47.0	43.2		47.5	18.1	8.1	54.2	28.6	12.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.7	9.2	0.2	6.5	4.2		5.4	0.8	0.1	5.4	6.6	0.1
Delay (s)	61.1	53.5	39.9	53.5	47.5		52.9	19.0	8.2	59.6	35.1	12.9
Level of Service	E	D	D	D	D		D	B	A	E	D	B
Approach Delay (s)		50.6			51.2			19.8			32.4	
Approach LOS		D			D			B			C	

Intersection Summary		
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.79	C
Actuated Cycle Length (s)	112.5	Sum of lost time (s)
Intersection Capacity Utilization	76.7%	16.0
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
430: F St/E St & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	895	195	20	1010	375	240	185	25	510	185	155
Future Volume (vph)	100	895	195	20	1010	375	240	185	25	510	185	155
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		3.0	4.0	3.0	3.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3158		1662	3260	1458	1646	1669		3131	1607	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3158		1662	3260	1458	1646	1669		3131	1607	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	106	952	207	21	1074	399	255	197	27	543	197	165
RTOR Reduction (vph)	0	16	0	0	0	131	0	4	0	0	27	0
Lane Group Flow (vph)	106	1143	0	21	1074	268	255	220	0	543	335	0
Heavy Vehicles (%)	0%	3%	0%	0%	2%	2%	1%	2%	10%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	11.6	50.0		2.0	38.4	60.8	18.4	18.6		22.4	22.6	
Effective Green, g (s)	13.6	52.0		3.0	40.4	62.8	19.4	19.6		22.4	23.6	
Actuated g/C Ratio	0.12	0.46		0.03	0.36	0.56	0.17	0.18		0.20	0.21	
Clearance Time (s)	6.0	6.0		4.0	6.0	4.0	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	4.7		2.5	4.7	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	201	1466		44	1175	817	285	292		626	338	
v/s Ratio Prot	c0.06	c0.36		0.01	c0.33	0.07	c0.15	0.13		0.17	c0.21	
v/s Ratio Perm						0.12						
v/c Ratio	0.53	0.78		0.48	0.91	0.33	0.89	0.75		0.87	0.99	
Uniform Delay, d1	46.2	25.2		53.7	34.1	13.2	45.3	43.9		43.4	44.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	4.2		5.8	12.3	0.2	27.8	10.0		12.0	46.5	
Delay (s)	48.1	29.4		59.6	46.5	13.4	73.1	53.9		55.4	90.6	
Level of Service	D	C		E	D	B	E	D		E	F	
Approach Delay (s)		30.9			37.8			64.1			69.5	
Approach LOS		C			D			E			E	

Intersection Summary

HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
440: Beacon Dr & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	1125	160	45	1000	175	150	110	60	145	150	230
Future Volume (vph)	135	1125	160	45	1000	175	150	110	60	145	150	230
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1662	3228	1488	1498	3228	1473	1646	1645		1662	1750	1473
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1662	3228	1488	1498	3228	1473	1646	1645		1662	1750	1473
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	139	1160	165	46	1031	180	155	113	62	149	155	237
RTOR Reduction (vph)	0	0	38	0	0	40	0	17	0	0	0	104
Lane Group Flow (vph)	139	1160	127	46	1031	140	155	158	0	149	155	133
Heavy Vehicles (%)	0%	3%	0%	11%	3%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	12.7	63.9	63.9	7.6	58.8	58.8	15.9	15.4		15.1	14.6	27.3
Effective Green, g (s)	12.7	65.9	65.9	7.6	60.8	60.8	15.9	15.4		15.1	14.6	27.3
Actuated g/C Ratio	0.11	0.55	0.55	0.06	0.51	0.51	0.13	0.13		0.13	0.12	0.23
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	175	1772	817	94	1635	746	218	211		209	212	384
v/s Ratio Prot	c0.08	c0.36		0.03	0.32		c0.09	c0.10		0.09	0.09	0.04
v/s Ratio Perm			0.09			0.09						0.05
v/c Ratio	0.79	0.65	0.16	0.49	0.63	0.19	0.71	0.75		0.71	0.73	0.35
Uniform Delay, d1	52.4	19.0	13.3	54.3	21.5	16.1	49.8	50.4		50.4	50.8	38.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.9	1.9	0.4	2.9	1.9	0.6	9.8	13.3		10.2	11.5	0.4
Delay (s)	73.2	20.9	13.7	57.2	23.3	16.7	59.6	63.8		60.6	62.4	39.3
Level of Service	E	C	B	E	C	B	E	E		E	E	D
Approach Delay (s)		25.1			23.6			61.8			51.8	
Approach LOS		C			C			E			D	

Intersection Summary		
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.71	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	70.4%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
450: Terry Ln & US 199

Baseline 2018 PM Peak
12/05/2018

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↑↑	↗	↖	↑↑	↗	↖↗	↖		↖	↗		
Traffic Volume (vph)	5	875	350	165	820	10	315	65	160	10	40	20	
Future Volume (vph)	5	875	350	165	820	10	315	65	160	10	40	20	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	0.95		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1661	3228	1452	1646	3228	1455	3225	1549		1498	1621		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1661	3228	1452	1646	3228	1455	3225	1549		1498	1621		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	5	911	365	172	854	10	328	68	167	10	42	21	
RTOR Reduction (vph)	0	0	79	0	0	5	0	56	0	0	14	0	
Lane Group Flow (vph)	5	911	286	172	854	5	328	179	0	10	49	0	
Confl. Peds. (#/hr)	1		2	2		1	4		1	1		4	
Heavy Vehicles (%)	0%	3%	0%	1%	3%	0%	0%	0%	0%	11%	0%	6%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases			2			6							
Actuated Green, G (s)	0.9	38.0	38.0	16.2	55.3	55.3	15.8	29.9		1.0	15.1		
Effective Green, g (s)	0.9	40.0	40.0	18.2	57.3	57.3	15.8	29.9		1.0	15.1		
Actuated g/C Ratio	0.01	0.38	0.38	0.17	0.55	0.55	0.15	0.28		0.01	0.14		
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7	2.5	2.5		2.5	2.5		
Lane Grp Cap (vph)	14	1228	552	285	1759	793	484	440		14	232		
v/s Ratio Prot	0.00	c0.28		c0.10	0.26		c0.10	c0.12		0.01	0.03		
v/s Ratio Perm			0.20			0.00							
v/c Ratio	0.36	0.74	0.52	0.60	0.49	0.01	0.68	0.41		0.71	0.21		
Uniform Delay, d1	51.8	28.1	25.1	40.1	14.8	10.9	42.2	30.4		51.9	39.7		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	11.0	2.9	1.5	3.0	0.4	0.0	3.4	0.4		95.3	0.3		
Delay (s)	62.8	30.9	26.6	43.1	15.2	10.9	45.6	30.9		147.2	40.1		
Level of Service	E	C	C	D	B	B	D	C		F	D		
Approach Delay (s)		29.8			19.8			39.5			54.8		
Approach LOS		C			B			D			D		
Intersection Summary													
HCM 2000 Control Delay			28.8	HCM 2000 Level of Service						C			
HCM 2000 Volume to Capacity ratio			0.66										
Actuated Cycle Length (s)			105.1	Sum of lost time (s)						16.0			
Intersection Capacity Utilization			63.1%	ICU Level of Service						B			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
460: Agness Ave & US 199

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	890	110	205	860	130	85	120	275	80	110	40
Future Volume (vph)	55	890	110	205	860	130	85	120	275	80	110	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	3228	1449	1614	3260	1455	1661	1525		1662	1673	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.55	1.00		0.16	1.00	
Satd. Flow (perm)	1630	3228	1449	1614	3260	1455	959	1525		281	1673	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	57	927	115	214	896	135	89	125	286	83	115	42
RTOR Reduction (vph)	0	0	74	0	0	48	0	47	0	0	9	0
Lane Group Flow (vph)	57	927	41	214	896	87	89	364	0	83	148	0
Confl. Peds. (#/hr)	1		3	3		1	2					2
Heavy Vehicles (%)	2%	3%	0%	3%	2%	0%	0%	0%	4%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	8.0	41.8	41.8	21.5	55.3	55.3	42.5	32.6		41.1	31.9	
Effective Green, g (s)	8.0	43.8	43.8	21.5	57.3	57.3	42.5	32.6		41.1	31.9	
Actuated g/C Ratio	0.06	0.36	0.36	0.17	0.47	0.47	0.35	0.26		0.33	0.26	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	105	1148	515	281	1517	677	387	403		197	433	
v/s Ratio Prot	0.03	c0.29		c0.13	0.27		0.02	c0.24		c0.03	0.09	
v/s Ratio Perm			0.03			0.06	0.06			0.11		
v/c Ratio	0.54	0.81	0.08	0.76	0.59	0.13	0.23	0.90		0.42	0.34	
Uniform Delay, d1	55.8	35.8	26.3	48.4	24.3	18.7	28.0	43.7		30.9	37.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.5	4.8	0.1	11.1	0.9	0.2	0.2	22.9		1.1	0.3	
Delay (s)	60.2	40.6	26.4	59.4	25.1	18.9	28.2	66.6		32.0	37.4	
Level of Service	E	D	C	E	C	B	C	E		C	D	
Approach Delay (s)		40.2			30.3			59.8			35.5	
Approach LOS		D			C			E			D	
Intersection Summary												
HCM 2000 Control Delay			39.0		HCM 2000 Level of Service						D	
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			123.1		Sum of lost time (s)						16.0	
Intersection Capacity Utilization			82.4%		ICU Level of Service						E	
Analysis Period (min)			15									

c Critical Lane Group

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑						↕	
Traffic Vol, veh/h	0	386	859	0	825	0	0	0	0	2	0	370
Future Vol, veh/h	0	386	859	0	825	0	0	0	0	2	0	370
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16965	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	5	6	0	6	0	0	0	0	0	0	7
Mvmt Flow	0	394	877	0	842	0	0	0	0	2	0	378

Major/Minor	Major1			Major2			Minor2			
Conflicting Flow All	-	0	-	-	-	0		1236	1236	-
Stage 1	-	-	-	-	-	-		842	842	-
Stage 2	-	-	-	-	-	-		394	394	-
Critical Hdwy	-	-	-	-	-	-		6.4	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-		5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-		5.4	5.5	-
Follow-up Hdwy	-	-	-	-	-	-		3.5	4	-
Pot Cap-1 Maneuver	0	-	0	0	-	0		196	178	0
Stage 1	0	-	0	0	-	0		426	383	0
Stage 2	0	-	0	0	-	0		686	609	0
Platoon blocked, %	-	-	-	-	-	-		-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-		196	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-		196	0	-
Stage 1	-	-	-	-	-	-		426	0	-
Stage 2	-	-	-	-	-	-		686	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	
HCM LOS			-

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	-	-
HCM Lane LOS	-	-	-
HCM 95th %tile Q(veh)	-	-	-

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔				
Traffic Vol, veh/h	15	70	0	0	145	65	2	645	230	0	0	0
Future Vol, veh/h	15	70	0	0	145	65	2	645	230	0	0	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	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	1	1	0	0	0
Mvmt Flow	17	79	0	0	163	73	2	725	258	0	0	0

Major/Minor	Minor2		Minor1		Major1						
Conflicting Flow All	940	987	-	-	858	854	0	0	0		
Stage 1	0	0	-	-	858	-	-	-	-		
Stage 2	940	987	-	-	0	-	-	-	-		
Critical Hdwy	7.1	6.5	-	-	6.5	6.2	4.1	-	-		
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-		
Critical Hdwy Stg 2	6.1	5.5	-	-	-	-	-	-	-		
Follow-up Hdwy	3.5	4	-	-	4	3.3	2.2	-	-		
Pot Cap-1 Maneuver	246	249	0	0	297	361	-	-	-		
Stage 1	-	-	0	0	376	-	-	-	-		
Stage 2	319	328	0	0	-	-	-	-	-		
Platoon blocked, %								-	-		
Mov Cap-1 Maneuver	111	249	-	-	297	361	-	-	-		
Mov Cap-2 Maneuver	111	249	-	-	297	-	-	-	-		
Stage 1	-	-	-	-	376	-	-	-	-		
Stage 2	144	328	-	-	-	-	-	-	-		

Approach	EB		WB		NB		
HCM Control Delay, s	37.3		23.1				
HCM LOS	E		C				

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	204	430
HCM Lane V/C Ratio	-	-	-	0.468	0.549
HCM Control Delay (s)	-	-	-	37.3	23.1
HCM Lane LOS	-	-	-	E	C
HCM 95th %tile Q(veh)	-	-	-	2.3	3.2

Intersection												
Int Delay, s/veh	19.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	2	10	110	5	25	10	335	2	85	1370	2
Future Vol, veh/h	5	2	10	110	5	25	10	335	2	85	1370	2
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	-	-	-	-	-	-	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	0	0
Mvmt Flow	5	2	11	120	5	27	11	364	2	92	1489	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1881	2062	746	1317	2062	183	1491	0	0	366	0	0
Stage 1	1674	1674	-	387	387	-	-	-	-	-	-	-
Stage 2	207	388	-	930	1675	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	45	55	360	~117	55	834	456	-	-	1204	-	-
Stage 1	101	154	-	614	613	-	-	-	-	-	-	-
Stage 2	781	612	-	291	153	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	37	50	360	~101	50	834	456	-	-	1204	-	-
Mov Cap-2 Maneuver	37	50	-	~101	50	-	-	-	-	-	-	-
Stage 1	99	142	-	599	598	-	-	-	-	-	-	-
Stage 2	731	597	-	257	141	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	59.6		263.7		0.4		0.5	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	456	-	-	84	115	1204	-	-
HCM Lane V/C Ratio	0.024	-	-	0.22	1.323	0.077	-	-
HCM Control Delay (s)	13.1	-	-	59.6	263.7	8.2	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	10.2	0.2	-	-

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

HCM Signalized Intersection Capacity Analysis
500: OR 238 & Union Ave/Harbeck Rd

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	105	55	30	75	180	45	805	20	200	1130	245
Future Volume (vph)	310	105	55	30	75	180	45	805	20	200	1130	245
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1660		1662	1750	1488	1662	3281		1662	3230	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	1660		1662	1750	1488	1662	3281		1662	3230	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	323	109	57	31	78	188	47	839	21	208	1177	255
RTOR Reduction (vph)	0	14	0	0	0	64	0	1	0	0	11	0
Lane Group Flow (vph)	323	152	0	31	78	124	47	859	0	208	1421	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	1	6		5		
Permitted Phases						4						2
Actuated Green, G (s)	26.6	30.0		5.5	8.9	25.7	6.5	35.3		16.8	45.6	
Effective Green, g (s)	26.6	30.0		5.5	8.9	25.7	6.5	36.8		16.8	47.1	
Actuated g/C Ratio	0.25	0.29		0.05	0.08	0.24	0.06	0.35		0.16	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.5	2.5		4.5	2.5	2.5	2.5	3.0		2.5	4.5	
Lane Grp Cap (vph)	420	473		86	148	420	102	1148		265	1447	
v/s Ratio Prot	c0.19	0.09		0.02	c0.04	0.05	0.03	0.26		c0.13		
v/s Ratio Perm						0.04						c0.44
v/c Ratio	0.77	0.32		0.36	0.53	0.29	0.46	0.75		0.78	0.98	
Uniform Delay, d1	36.4	29.5		48.1	46.1	32.3	47.6	30.1		42.4	28.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.9	0.3		4.4	2.6	0.3	2.4	2.7		13.6	19.5	
Delay (s)	44.3	29.8		52.5	48.7	32.6	50.0	32.8		56.1	48.0	
Level of Service	D	C		D	D	C	D	C		E	D	
Approach Delay (s)		39.4			38.9			33.7			49.1	
Approach LOS		D			D			C			D	

Intersection Summary

HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	105.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑		↕	↑↑	
Traffic Vol, veh/h	35	2	105	2	2	5	35	750	2	5	1070	40
Future Vol, veh/h	35	2	105	2	2	5	35	750	2	5	1070	40
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	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	0	0	0	3	1	0	0	0	0
Mvmt Flow	37	2	111	2	2	5	37	789	2	5	1126	42

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1627	2022	584	1438	2042	396	1168	0	0	791	0	0
Stage 1	1157	1157	-	864	864	-	-	-	-	-	-	-
Stage 2	470	865	-	574	1178	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.92	7.5	6.5	6.9	4.16	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.31	3.5	4	3.3	2.23	-	-	2.2	-	-
Pot Cap-1 Maneuver	69	59	457	95	57	609	588	-	-	838	-	-
Stage 1	212	273	-	319	374	-	-	-	-	-	-	-
Stage 2	548	374	-	476	267	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	63	55	457	66	53	609	588	-	-	838	-	-
Mov Cap-2 Maneuver	63	55	-	66	53	-	-	-	-	-	-	-
Stage 1	199	271	-	299	350	-	-	-	-	-	-	-
Stage 2	506	350	-	356	265	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	90.2		38.2		0.5		0	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	588	-	-	173	118	838	-
HCM Lane V/C Ratio	0.063	-	-	0.864	0.08	0.006	-
HCM Control Delay (s)	11.5	-	-	90.2	38.2	9.3	-
HCM Lane LOS	B	-	-	F	E	A	-
HCM 95th %tile Q(veh)	0.2	-	-	6.2	0.3	0	-

HCM Signalized Intersection Capacity Analysis
520: OR 238 & Harbeck Rd

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	50	35	145	55	40	10	60	600	30	10	980	100
Future Volume (vph)	50	35	145	55	40	10	60	600	30	10	980	100
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.92			0.99		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1584			1666		1662	3270		1662	3249	
Flt Permitted		0.92			0.66		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1473			1120		1662	3270		1662	3249	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	38	156	59	43	11	65	645	32	11	1054	108
RTOR Reduction (vph)	0	60	0	0	4	0	0	2	0	0	5	0
Lane Group Flow (vph)	0	188	0	0	109	0	65	675	0	11	1157	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		14.3			14.3		6.3	40.3		1.1	35.1	
Effective Green, g (s)		15.3			15.3		6.8	41.8		1.6	36.6	
Actuated g/C Ratio		0.22			0.22		0.10	0.59		0.02	0.52	
Clearance Time (s)		5.0			5.0		4.5	5.5		4.5	5.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.7		2.5	3.7	
Lane Grp Cap (vph)		318			242		159	1933		37	1681	
v/s Ratio Prot							c0.04	0.21		0.01	c0.36	
v/s Ratio Perm		c0.13			0.10							
v/c Ratio		0.59			0.45		0.41	0.35		0.30	0.69	
Uniform Delay, d1		24.9			24.1		30.1	7.4		34.0	12.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.4			1.0		1.2	0.1		3.3	1.3	
Delay (s)		27.3			25.0		31.3	7.6		37.3	14.0	
Level of Service		C			C		C	A		D	B	
Approach Delay (s)		27.3			25.0			9.7			14.3	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
530: OR 238 & New Hope Rd

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	235	10	5	410	670	435
Future Volume (vph)	235	10	5	410	670	435
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.99		1.00	1.00	0.94	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1661		1662	3260	3116	
Flt Permitted	0.95		0.17	1.00	1.00	
Satd. Flow (perm)	1661		303	3260	3116	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	245	10	5	427	698	453
RTOR Reduction (vph)	2	0	0	0	150	0
Lane Group Flow (vph)	253	0	5	427	1001	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	8			6	2	
Permitted Phases			6			
Actuated Green, G (s)	12.3		22.1	22.1	22.1	
Effective Green, g (s)	13.7		23.5	23.5	23.5	
Actuated g/C Ratio	0.30		0.52	0.52	0.52	
Clearance Time (s)	5.4		5.4	5.4	5.4	
Vehicle Extension (s)	2.5		4.5	4.5	4.5	
Lane Grp Cap (vph)	503		157	1694	1620	
v/s Ratio Prot	c0.15			0.13	c0.32	
v/s Ratio Perm			0.02			
v/c Ratio	0.50		0.03	0.25	0.62	
Uniform Delay, d1	12.9		5.3	6.0	7.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.6		0.1	0.1	0.9	
Delay (s)	13.5		5.4	6.1	8.6	
Level of Service	B		A	A	A	
Approach Delay (s)	13.5			6.1	8.6	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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	2	135	60	30	200	2	45	2	10	5	5	2
Future Vol, veh/h	2	135	60	30	200	2	45	2	10	5	5	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	2	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	2	167	74	37	247	2	56	2	12	6	6	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	249	0	0	241	0	0	534	531	204	537	567	248
Stage 1	-	-	-	-	-	-	208	208	-	322	322	-
Stage 2	-	-	-	-	-	-	326	323	-	215	245	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1328	-	-	1337	-	-	460	457	842	458	436	796
Stage 1	-	-	-	-	-	-	799	734	-	694	655	-
Stage 2	-	-	-	-	-	-	691	654	-	792	707	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1328	-	-	1337	-	-	442	441	842	438	421	796
Mov Cap-2 Maneuver	-	-	-	-	-	-	442	441	-	438	421	-
Stage 1	-	-	-	-	-	-	797	733	-	693	634	-
Stage 2	-	-	-	-	-	-	660	633	-	776	706	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	13.7	13
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	482	1328	-	-	1337	-	-	465
HCM Lane V/C Ratio	0.146	0.002	-	-	0.028	-	-	0.032
HCM Control Delay (s)	13.7	7.7	0	-	7.8	0	-	13
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	30	20	40	50	85	20	105	50	50	105	5
Future Vol, veh/h	2	30	20	40	50	85	20	105	50	50	105	5
Conflicting Peds, #/hr	0	0	2	2	0	0	3	0	5	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	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	32	22	43	54	91	22	113	54	54	113	5

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	484	443	121	442	418	145	121	0	0	172	0	0
Stage 1	227	227	-	189	189	-	-	-	-	-	-	-
Stage 2	257	216	-	253	229	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	496	512	936	529	529	908	1479	-	-	1417	-	-
Stage 1	780	720	-	817	748	-	-	-	-	-	-	-
Stage 2	752	728	-	756	718	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	390	479	932	466	495	904	1475	-	-	1410	-	-
Mov Cap-2 Maneuver	390	479	-	466	495	-	-	-	-	-	-	-
Stage 1	764	688	-	799	732	-	-	-	-	-	-	-
Stage 2	616	712	-	674	686	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.8		13.3		0.9		2.4	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1475	-	-	583	623	1410	-
HCM Lane V/C Ratio	0.015	-	-	0.096	0.302	0.038	-
HCM Control Delay (s)	7.5	0	-	11.8	13.3	7.7	0
HCM Lane LOS	A	A	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.3	1.3	0.1	-

Intersection						
Int Delay, s/veh	3.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	110	195	35	35	210
Future Vol, veh/h	55	110	195	35	35	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	63	125	222	40	40	239

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	561	242	0	0	262
Stage 1	242	-	-	-	-
Stage 2	319	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	492	802	-	-	1314
Stage 1	803	-	-	-	-
Stage 2	741	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	475	802	-	-	1314
Mov Cap-2 Maneuver	475	-	-	-	-
Stage 1	775	-	-	-	-
Stage 2	741	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	652	1314
HCM Lane V/C Ratio	-	-	0.288	0.03
HCM Control Delay (s)	-	-	12.7	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	2	2	2	2	15	2	225	5	10	250	2
Future Vol, veh/h	2	2	2	2	2	15	2	225	5	10	250	2
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	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	2	2	2	2	16	2	245	5	11	272	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	556	549	273	549	548	248	274	0	0	250	0	0
Stage 1	295	295	-	252	252	-	-	-	-	-	-	-
Stage 2	261	254	-	297	296	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	445	446	771	450	447	796	1301	-	-	1327	-	-
Stage 1	718	673	-	757	702	-	-	-	-	-	-	-
Stage 2	748	701	-	716	672	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	430	441	771	443	442	796	1301	-	-	1327	-	-
Mov Cap-2 Maneuver	430	441	-	443	442	-	-	-	-	-	-	-
Stage 1	717	666	-	755	701	-	-	-	-	-	-	-
Stage 2	729	700	-	705	665	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.2		10.5		0.1		0.3	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1301	-	-	509	681	1327	-	-
HCM Lane V/C Ratio	0.002	-	-	0.013	0.03	0.008	-	-
HCM Control Delay (s)	7.8	0	-	12.2	10.5	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	10	2	25	10	130	2	105	15	130	170	2
Future Vol, veh/h	2	10	2	25	10	130	2	105	15	130	170	2
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	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	1	0	0
Mvmt Flow	2	11	2	28	11	148	2	119	17	148	193	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	701	630	194	629	623	128	195	0	0	136	0	0
Stage 1	490	490	-	132	132	-	-	-	-	-	-	-
Stage 2	211	140	-	497	491	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.209	-	-
Pot Cap-1 Maneuver	356	401	853	398	405	927	1390	-	-	1454	-	-
Stage 1	564	552	-	876	791	-	-	-	-	-	-	-
Stage 2	796	785	-	559	552	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	266	354	853	353	358	927	1390	-	-	1454	-	-
Mov Cap-2 Maneuver	266	354	-	353	358	-	-	-	-	-	-	-
Stage 1	563	489	-	874	789	-	-	-	-	-	-	-
Stage 2	658	783	-	482	489	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.3		12.2		0.1		3.3	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1390	-	-	367	690	1454	-
HCM Lane V/C Ratio	0.002	-	-	0.043	0.272	0.102	-
HCM Control Delay (s)	7.6	0	-	15.3	12.2	7.8	0
HCM Lane LOS	A	A	-	C	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	1.1	0.3	-

Intersection						
Int Delay, s/veh	8.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	185	95	135	375	120	105
Future Vol, veh/h	185	95	135	375	120	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	201	103	147	408	130	114

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	304	0	955
Stage 1	-	-	-	-	253
Stage 2	-	-	-	-	702
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1268	-	289
Stage 1	-	-	-	-	794
Stage 2	-	-	-	-	495
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1268	-	246
Mov Cap-2 Maneuver	-	-	-	-	246
Stage 1	-	-	-	-	675
Stage 2	-	-	-	-	495

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	33.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	363	-	-	1268	-
HCM Lane V/C Ratio	0.674	-	-	0.116	-
HCM Control Delay (s)	33.1	-	-	8.2	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	4.7	-	-	0.4	-

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	300	5	30	525	2	5	2	30	2	2	2
Future Vol, veh/h	2	300	5	30	525	2	5	2	30	2	2	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	337	6	34	590	2	6	2	34	2	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	592	0	0	343	0	0	1005	1004	340	1021	1006	591
Stage 1	-	-	-	-	-	-	344	344	-	659	659	-
Stage 2	-	-	-	-	-	-	661	660	-	362	347	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	994	-	-	1227	-	-	222	244	707	217	243	511
Stage 1	-	-	-	-	-	-	676	640	-	456	464	-
Stage 2	-	-	-	-	-	-	455	463	-	661	638	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	994	-	-	1227	-	-	212	234	707	198	233	511
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	234	-	198	233	-
Stage 1	-	-	-	-	-	-	675	639	-	455	445	-
Stage 2	-	-	-	-	-	-	432	444	-	626	637	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.4			12.9			18.9		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	496	994	-	-	1227	-	-	266
HCM Lane V/C Ratio	0.084	0.002	-	-	0.027	-	-	0.025
HCM Control Delay (s)	12.9	8.6	0	-	8	0	-	18.9
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.1

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	380	10	15	655	2	15	5	10	5	2	5
Future Vol, veh/h	2	380	10	15	655	2	15	5	10	5	2	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	432	11	17	744	2	17	6	11	6	2	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	746	0	0	443	0	0	1225	1222	438	1229	1226	745
Stage 1	-	-	-	-	-	-	442	442	-	779	779	-
Stage 2	-	-	-	-	-	-	783	780	-	450	447	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	871	-	-	1128	-	-	157	181	623	156	180	417
Stage 1	-	-	-	-	-	-	598	580	-	392	409	-
Stage 2	-	-	-	-	-	-	390	409	-	592	577	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	871	-	-	1128	-	-	150	176	623	146	175	417
Mov Cap-2 Maneuver	-	-	-	-	-	-	150	176	-	146	175	-
Stage 1	-	-	-	-	-	-	596	578	-	391	398	-
Stage 2	-	-	-	-	-	-	373	398	-	574	575	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			25.7			23.5		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	208	871	-	-	1128	-	-	208
HCM Lane V/C Ratio	0.164	0.003	-	-	0.015	-	-	0.066
HCM Control Delay (s)	25.7	9.1	0	-	8.2	0	-	23.5
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.2

HCM Signalized Intersection Capacity Analysis
620: 4th St & E St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕↕		↕	↑			↕		
Traffic Volume (vph)	0	0	0	70	385	55	15	295	0	0	325	95	
Future Volume (vph)	0	0	0	70	385	55	15	295	0	0	325	95	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)					4.0		4.0	4.0			4.0		
Lane Util. Factor					0.95		1.00	1.00			1.00		
Frt					0.98		1.00	1.00			0.97		
Flt Protected					0.99		0.95	1.00			1.00		
Satd. Flow (prot)					3242		1662	1750			1697		
Flt Permitted					0.99		0.41	1.00			1.00		
Satd. Flow (perm)					3242		721	1750			1697		
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	
Adj. Flow (vph)	0	0	0	83	458	65	18	351	0	0	387	113	
RTOR Reduction (vph)	0	0	0	0	24	0	0	0	0	0	15	0	
Lane Group Flow (vph)	0	0	0	0	582	0	18	351	0	0	485	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					4			6			2		
Permitted Phases				4			6						
Actuated Green, G (s)					13.1		28.9	28.9			28.9		
Effective Green, g (s)					13.1		28.9	28.9			28.9		
Actuated g/C Ratio					0.26		0.58	0.58			0.58		
Clearance Time (s)					4.0		4.0	4.0			4.0		
Vehicle Extension (s)					0.2		0.2	0.2			0.2		
Lane Grp Cap (vph)					849		416	1011			980		
v/s Ratio Prot								0.20			c0.29		
v/s Ratio Perm					0.18		0.02						
v/c Ratio					0.69		0.04	0.35			0.50		
Uniform Delay, d1					16.6		4.6	5.6			6.2		
Progression Factor					1.00		0.69	0.73			1.00		
Incremental Delay, d2					1.8		0.2	0.9			1.8		
Delay (s)					18.4		3.3	5.0			8.0		
Level of Service					B		A	A			A		
Approach Delay (s)		0.0			18.4			4.9			8.0		
Approach LOS		A			B			A			A		
Intersection Summary													
HCM 2000 Control Delay			11.5		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.55										
Actuated Cycle Length (s)			50.0		Sum of lost time (s)						8.0		
Intersection Capacity Utilization			54.7%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
630: 4th St & F St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕						↕		↕	↕		
Traffic Volume (vph)	85	215	50	0	0	0	0	235	70	40	370	0	
Future Volume (vph)	85	215	50	0	0	0	0	235	70	40	370	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0						4.0		4.0	4.0		
Lane Util. Factor		0.95						1.00		1.00	1.00		
Frt		0.98						0.97		1.00	1.00		
Flt Protected		0.99						1.00		0.95	1.00		
Satd. Flow (prot)		3215						1696		1662	1750		
Flt Permitted		0.99						1.00		0.51	1.00		
Satd. Flow (perm)		3215						1696		898	1750		
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	
Adj. Flow (vph)	108	272	63	0	0	0	0	297	89	51	468	0	
RTOR Reduction (vph)	0	38	0	0	0	0	0	14	0	0	0	0	
Lane Group Flow (vph)	0	405	0	0	0	0	0	372	0	51	468	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type	Perm	NA						NA		Perm	NA		
Protected Phases		8						6			2		
Permitted Phases	8									2			
Actuated Green, G (s)		10.9						31.1		31.1	31.1		
Effective Green, g (s)		10.9						31.1		31.1	31.1		
Actuated g/C Ratio		0.22						0.62		0.62	0.62		
Clearance Time (s)		4.0						4.0		4.0	4.0		
Vehicle Extension (s)		0.2						0.2		0.2	0.2		
Lane Grp Cap (vph)		700						1054		558	1088		
v/s Ratio Prot								0.22			c0.27		
v/s Ratio Perm		0.13								0.06			
v/c Ratio		0.58						0.35		0.09	0.43		
Uniform Delay, d1		17.5						4.6		3.8	4.9		
Progression Factor		1.00						1.00		1.17	0.97		
Incremental Delay, d2		0.7						0.9		0.3	1.1		
Delay (s)		18.2						5.5		4.7	5.9		
Level of Service		B						A		A	A		
Approach Delay (s)		18.2			0.0			5.5			5.8		
Approach LOS		B			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			9.8									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.47										
Actuated Cycle Length (s)			50.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			54.7%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
640: 4th St & G St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	15	135	50	25	220	70	50	175	25	45	350	30
Future Volume (vph)	15	135	50	25	220	70	50	175	25	45	350	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.97		1.00	0.98		1.00	0.99	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684			1691		1662	1717		1662	1714	
Flt Permitted		0.97			0.96		0.33	1.00		0.58	1.00	
Satd. Flow (perm)		1634			1631		586	1717		1010	1714	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	19	167	62	31	272	86	62	216	31	56	432	37
RTOR Reduction (vph)	0	20	0	0	18	0	0	8	0	0	5	0
Lane Group Flow (vph)	0	228	0	0	371	0	62	239	0	56	464	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		14.4			14.4		22.1	19.1		22.5	19.3	
Effective Green, g (s)		14.4			14.4		22.1	19.1		22.5	19.3	
Actuated g/C Ratio		0.30			0.30		0.45	0.39		0.46	0.40	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		2.5			2.5		2.5	6.1		2.5	6.1	
Lane Grp Cap (vph)		483			482		332	673		509	679	
v/s Ratio Prot							c0.01	0.14		0.01	c0.27	
v/s Ratio Perm		0.14			c0.23		0.07			0.04		
v/c Ratio		0.47			0.77		0.19	0.36		0.11	0.68	
Uniform Delay, d1		14.0			15.6		8.0	10.5		7.3	12.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5			7.2		0.2	0.9		0.1	4.4	
Delay (s)		14.6			22.8		8.2	11.4		7.4	16.5	
Level of Service		B			C		A	B		A	B	
Approach Delay (s)		14.6			22.8			10.7			15.6	
Approach LOS		B			C			B			B	

Intersection Summary

HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection

Intersection Delay, s/veh 9.5
Intersection LOS A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	135	5	5	90	130	195
Future Vol, veh/h	135	5	5	90	130	195
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	0	0	1
Mvmt Flow	148	5	5	99	143	214
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.5	8.5	9.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	5%	96%	0%
Vol Thru, %	95%	0%	40%
Vol Right, %	0%	4%	60%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	95	140	325
LT Vol	5	135	0
Through Vol	90	0	130
RT Vol	0	5	195
Lane Flow Rate	104	154	357
Geometry Grp	1	1	1
Degree of Util (X)	0.136	0.217	0.404
Departure Headway (Hd)	4.679	5.079	4.069
Convergence, Y/N	Yes	Yes	Yes
Cap	765	705	886
Service Time	2.712	3.124	2.092
HCM Lane V/C Ratio	0.136	0.218	0.403
HCM Control Delay	8.5	9.5	9.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.5	0.8	2

Intersection						
Int Delay, s/veh	65.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	480	735	90	175	60
Future Vol, veh/h	65	480	735	90	175	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	70	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	71	527	808	99	192	66

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	907	0	-	0	1527 858
Stage 1	-	-	-	-	858 -
Stage 2	-	-	-	-	669 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	759	-	-	-	~ 131 359
Stage 1	-	-	-	-	419 -
Stage 2	-	-	-	-	513 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	759	-	-	-	~ 119 359
Mov Cap-2 Maneuver	-	-	-	-	~ 119 -
Stage 1	-	-	-	-	380 -
Stage 2	-	-	-	-	513 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	\$ 442.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	759	-	-	-	143
HCM Lane V/C Ratio	0.094	-	-	-	1.806
HCM Control Delay (s)	10.2	-	-	-	\$ 442.4
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	19.4

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

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Vol, veh/h	5	640	15	80	790	20	15	20	65	5	5	10
Future Vol, veh/h	5	640	15	80	790	20	15	20	65	5	5	10
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	-	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	5	696	16	87	859	22	16	22	71	5	5	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	881	0	0	712	0	0	1766	1769	356	1413	1766	870
Stage 1	-	-	-	-	-	-	714	714	-	1044	1044	-
Stage 2	-	-	-	-	-	-	1052	1055	-	369	722	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	776	-	-	897	-	-	60	84	646	108	85	354
Stage 1	-	-	-	-	-	-	393	438	-	279	309	-
Stage 2	-	-	-	-	-	-	276	305	-	629	434	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	776	-	-	897	-	-	51	75	646	69	76	354
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	75	-	69	76	-
Stage 1	-	-	-	-	-	-	389	433	-	276	279	-
Stage 2	-	-	-	-	-	-	237	275	-	526	429	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.8			74			41.5		
HCM LOS							F			E		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	151	776	-	-	897	-	-	120
HCM Lane V/C Ratio	0.72	0.007	-	-	0.097	-	-	0.181
HCM Control Delay (s)	74	9.7	0.1	-	9.4	-	-	41.5
HCM Lane LOS	F	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	4.3	0	-	-	0.3	-	-	0.6

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑		↑	
Traffic Vol, veh/h	10	255	165	25	35	10
Future Vol, veh/h	10	255	165	25	35	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	287	185	28	39	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	213	0	-	0	365 199
Stage 1	-	-	-	-	199 -
Stage 2	-	-	-	-	166 -
Critical Hdwy	4.1	-	-	-	6.6 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.8 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1369	-	-	-	626 847
Stage 1	-	-	-	-	839 -
Stage 2	-	-	-	-	852 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1369	-	-	-	620 847
Mov Cap-2 Maneuver	-	-	-	-	620 -
Stage 1	-	-	-	-	831 -
Stage 2	-	-	-	-	852 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1369	-	-	-	659
HCM Lane V/C Ratio	0.008	-	-	-	0.077
HCM Control Delay (s)	7.7	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	30	25	5	35	5	30	30	10	5	25	2
Future Vol, veh/h	2	30	25	5	35	5	30	30	10	5	25	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	33	27	5	38	5	33	33	11	5	27	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	43	0	0	60	0	0	116	104	47	124	115	41
Stage 1	-	-	-	-	-	-	51	51	-	51	51	-
Stage 2	-	-	-	-	-	-	65	53	-	73	64	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1579	-	-	1556	-	-	865	790	1028	855	779	1036
Stage 1	-	-	-	-	-	-	967	856	-	967	856	-
Stage 2	-	-	-	-	-	-	951	855	-	942	846	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1579	-	-	1556	-	-	837	787	1028	817	776	1036
Mov Cap-2 Maneuver	-	-	-	-	-	-	837	787	-	817	776	-
Stage 1	-	-	-	-	-	-	966	855	-	966	853	-
Stage 2	-	-	-	-	-	-	916	852	-	895	845	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.8			9.7			9.7		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	836	1579	-	-	1556	-	-	795
HCM Lane V/C Ratio	0.092	0.001	-	-	0.004	-	-	0.044
HCM Control Delay (s)	9.7	7.3	0	-	7.3	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	35	45	5	35	10	65	25	5	2	25	5
Future Vol, veh/h	2	35	45	5	35	10	65	25	5	2	25	5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	4	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	38	49	5	38	11	71	27	5	2	27	5
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	7.4	7.5	8	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	68%	2%	10%	6%
Vol Thru, %	26%	43%	70%	78%
Vol Right, %	5%	55%	20%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	95	82	50	32
LT Vol	65	2	5	2
Through Vol	25	35	35	25
RT Vol	5	45	10	5
Lane Flow Rate	104	90	55	35
Geometry Grp	1	1	1	1
Degree of Util (X)	0.124	0.097	0.063	0.041
Departure Headway (Hd)	4.283	3.859	4.112	4.152
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	829	912	857	850
Service Time	2.352	1.952	2.208	2.24
HCM Lane V/C Ratio	0.125	0.099	0.064	0.041
HCM Control Delay	8	7.4	7.5	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.2	0.1

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	15	150	80	5	95	5	55	20	10	20	30	25
Future Vol, veh/h	15	150	80	5	95	5	55	20	10	20	30	25
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	150	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	16	165	88	5	104	5	60	22	11	22	33	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	109	0	0	253	0	0	388	360	209	375	402	107
Stage 1	-	-	-	-	-	-	241	241	-	117	117	-
Stage 2	-	-	-	-	-	-	147	119	-	258	285	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1494	-	-	1324	-	-	574	570	836	586	540	953
Stage 1	-	-	-	-	-	-	767	710	-	892	803	-
Stage 2	-	-	-	-	-	-	860	801	-	751	679	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1494	-	-	1324	-	-	525	561	836	555	532	953
Mov Cap-2 Maneuver	-	-	-	-	-	-	525	561	-	555	532	-
Stage 1	-	-	-	-	-	-	759	702	-	882	800	-
Stage 2	-	-	-	-	-	-	798	798	-	710	672	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.4			12.7			11.5		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	558	1494	-	-	1324	-	-	632
HCM Lane V/C Ratio	0.167	0.011	-	-	0.004	-	-	0.13
HCM Control Delay (s)	12.7	7.4	-	-	7.7	-	-	11.5
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.4

HCM Signalized Intersection Capacity Analysis
720: Willow Ln & Redwood Ave

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	275	10	25	420	135	15	25	35	100	5	2
Future Volume (vph)	5	275	10	25	420	135	15	25	35	100	5	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.96			0.94			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	
Satd. Flow (prot)	1662	1724		1583	1682			1597			1668	
Flt Permitted	0.35	1.00		0.53	1.00			0.93			0.81	
Satd. Flow (perm)	606	1724		877	1682			1496			1407	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	5	296	11	27	452	145	16	27	38	108	5	2
RTOR Reduction (vph)	0	1	0	0	10	0	0	31	0	0	1	0
Lane Group Flow (vph)	5	306	0	27	587	0	0	50	0	0	114	0
Heavy Vehicles (%)	0%	1%	0%	5%	0%	1%	0%	5%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	28.6	28.0		30.9	28.9			9.4			9.4	
Effective Green, g (s)	29.6	29.0		31.9	30.4			9.9			9.9	
Actuated g/C Ratio	0.55	0.54		0.60	0.57			0.19			0.19	
Clearance Time (s)	4.5	5.0		4.5	5.5			4.5			4.5	
Vehicle Extension (s)	2.5	4.5		2.5	4.5			2.5			2.5	
Lane Grp Cap (vph)	357	936		556	957			277			260	
v/s Ratio Prot	0.00	0.18		c0.00	c0.35							
v/s Ratio Perm	0.01			0.03				0.03			c0.08	
v/c Ratio	0.01	0.33		0.05	0.61			0.18			0.44	
Uniform Delay, d1	5.7	6.8		4.5	7.6			18.3			19.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.4		0.0	1.5			0.2			0.9	
Delay (s)	5.7	7.1		4.5	9.1			18.6			20.2	
Level of Service	A	A		A	A			B			C	
Approach Delay (s)		7.1			8.9			18.6			20.2	
Approach LOS		A			A			B			C	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
730: Dowell Rd & Redwood Ave

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	520	65	40	605	105	130	35	80	75	40	10
Future Volume (vph)	10	520	65	40	605	105	130	35	80	75	40	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.90		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1721		1662	1697		1646	1567		1630	1700	
Flt Permitted	0.20	1.00		0.24	1.00		0.44	1.00		0.68	1.00	
Satd. Flow (perm)	351	1721		412	1697		762	1567		1168	1700	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	542	68	42	630	109	135	36	83	78	42	10
RTOR Reduction (vph)	0	3	0	0	5	0	0	70	0	0	8	0
Lane Group Flow (vph)	10	607	0	42	734	0	135	49	0	78	44	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	1%	0%	0%	2%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	38.7	38.0		44.3	40.8		22.2	11.6		12.8	6.2	
Effective Green, g (s)	38.7	39.0		44.3	41.8		22.2	12.6		12.8	7.2	
Actuated g/C Ratio	0.50	0.50		0.57	0.54		0.29	0.16		0.16	0.09	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	4.2		2.5	4.2		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	186	863		291	912		354	254		231	157	
v/s Ratio Prot	0.00	0.35		c0.01	c0.43		c0.06	0.03		0.03	0.03	
v/s Ratio Perm	0.03			0.08			c0.05			0.03		
v/c Ratio	0.05	0.70		0.14	0.81		0.38	0.19		0.34	0.28	
Uniform Delay, d1	12.0	14.9		9.7	14.6		21.7	28.2		28.5	32.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.9		0.2	5.6		0.5	0.3		0.6	0.7	
Delay (s)	12.1	17.8		9.9	20.3		22.2	28.4		29.1	33.5	
Level of Service	B	B		A	C		C	C		C	C	
Approach Delay (s)		17.7			19.7			25.1			30.9	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
740: Allen Creek Rd & Redwood Ave

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	550	120	20	945	2	1	1	35	1	2	2
Future Volume (vph)	1	550	120	20	945	2	1	1	35	1	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1703		1662	1749		1662	1494		1662	1619	
Flt Permitted	0.12	1.00		0.29	1.00		0.76	1.00		0.75	1.00	
Satd. Flow (perm)	210	1703		501	1749		1322	1494		1321	1619	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	598	130	22	1027	2	1	1	38	1	2	2
RTOR Reduction (vph)	0	4	0	0	0	0	0	35	0	0	2	0
Lane Group Flow (vph)	1	724	0	22	1029	0	1	4	0	1	2	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	48.6	47.9		48.8	48.0		5.0	4.3		5.0	4.3	
Effective Green, g (s)	50.6	48.9		50.8	49.0		7.0	5.3		7.0	5.3	
Actuated g/C Ratio	0.69	0.66		0.69	0.66		0.09	0.07		0.09	0.07	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	4.2		2.0	4.2		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	177	1129		373	1162		133	107		133	116	
v/s Ratio Prot	0.00	0.43		c0.00	c0.59		0.00	c0.00		c0.00	0.00	
v/s Ratio Perm	0.00			0.04			0.00			0.00		
v/c Ratio	0.01	0.64		0.06	0.89		0.01	0.03		0.01	0.02	
Uniform Delay, d1	9.3	7.3		4.8	10.1		30.2	31.8		30.2	31.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.5		0.0	8.6		0.0	0.0		0.0	0.0	
Delay (s)	9.3	8.7		4.8	18.7		30.2	31.9		30.2	31.8	
Level of Service	A	A		A	B		C	C		C	C	
Approach Delay (s)		8.7			18.4			31.8			31.5	
Approach LOS		A			B			C			C	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	2	2	5	2	5	2	70	10	2	40	2
Future Vol, veh/h	2	2	2	5	2	5	2	70	10	2	40	2
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	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	2	2	6	2	6	2	81	12	2	47	2

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	147	149	48	145	144	87	49	0	0	93	0	0
Stage 1	52	52	-	91	91	-	-	-	-	-	-	-
Stage 2	95	97	-	54	53	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	826	746	1027	828	751	977	1571	-	-	1514	-	-
Stage 1	966	856	-	921	823	-	-	-	-	-	-	-
Stage 2	917	819	-	963	855	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	818	745	1027	823	749	977	1571	-	-	1514	-	-
Mov Cap-2 Maneuver	818	745	-	823	749	-	-	-	-	-	-	-
Stage 1	965	855	-	920	822	-	-	-	-	-	-	-
Stage 2	908	818	-	957	854	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.3		9.2		0.2		0.3	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1571	-	-	848	866	1514	-
HCM Lane V/C Ratio	0.001	-	-	0.008	0.016	0.002	-
HCM Control Delay (s)	7.3	0	-	9.3	9.2	7.4	0
HCM Lane LOS	A	A	-	A	A	A	A
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶						↷			↶	↷
Traffic Vol, veh/h	0	240	2	0	0	0	5	0	5	2	10	280
Future Vol, veh/h	0	240	2	0	0	0	5	0	5	2	10	280
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	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	16983	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	286	2	0	0	0	6	0	6	2	12	333

Major/Minor	Major1			Minor1			Major2		
Conflicting Flow All	-	0	0	303	303	287	288	0	0
Stage 1	-	-	-	287	287	-	-	-	-
Stage 2	-	-	-	16	16	-	-	-	-
Critical Hdwy	-	-	-	6.4	6.5	6.2	4.1	-	-
Critical Hdwy Stg 1	-	-	-	5.4	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-	5.4	5.5	-	-	-	-
Follow-up Hdwy	-	-	-	3.5	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	0	-	-	693	613	757	1286	-	0
Stage 1	0	-	-	766	678	-	-	-	0
Stage 2	0	-	-	1012	886	-	-	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	692	0	757	1286	-	-
Mov Cap-2 Maneuver	-	-	-	692	0	-	-	-	-
Stage 1	-	-	-	764	0	-	-	-	-
Stage 2	-	-	-	1012	0	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	10.1	1.3
HCM LOS		B	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBL	SBT
Capacity (veh/h)	723	-	-	1286	-
HCM Lane V/C Ratio	0.016	-	-	0.002	-
HCM Control Delay (s)	10.1	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕			↕	
Traffic Vol, veh/h	5	2	2	15	2	100	2	70	5	105	90	5
Future Vol, veh/h	5	2	2	15	2	100	2	70	5	105	90	5
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	-	-	-	-	-	135	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	5	2	2	16	2	106	2	74	5	112	96	5

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	458	406	99	406	406	77	101	0	0	79	0	0
Stage 1	323	323	-	81	81	-	-	-	-	-	-	-
Stage 2	135	83	-	325	325	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	516	537	962	559	537	990	1504	-	-	1532	-	-
Stage 1	693	654	-	932	832	-	-	-	-	-	-	-
Stage 2	873	830	-	692	653	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	431	495	962	523	495	990	1504	-	-	1532	-	-
Mov Cap-2 Maneuver	431	495	-	523	495	-	-	-	-	-	-	-
Stage 1	692	603	-	931	831	-	-	-	-	-	-	-
Stage 2	776	829	-	634	602	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.2		9.6		0.2		4	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1504	-	-	508	520	990	1532	-	-
HCM Lane V/C Ratio	0.001	-	-	0.019	0.035	0.107	0.073	-	-
HCM Control Delay (s)	7.4	0	-	12.2	12.2	9.1	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.4	0.2	-	-

HCM Signalized Intersection Capacity Analysis
780: Allen Creek Rd & Albertsons

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	400	2	65	2	2	2	105	215	2	25	2	245
Future Volume (vph)	400	2	65	2	2	2	105	215	2	25	2	245
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	1.00			1.00	0.95
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00			1.00	0.98
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)	1579	1584	1488	1662	1619		1662	1748			1662	3248
Flt Permitted	0.76	0.73	1.00	0.61	1.00		0.56	1.00			0.61	1.00
Satd. Flow (perm)	1255	1207	1488	1071	1619		974	1748			1066	3248
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	444	2	72	2	2	2	117	239	2	28	2	272
RTOR Reduction (vph)	0	0	49	0	1	0	0	1	0	0	0	30
Lane Group Flow (vph)	222	224	23	2	3	0	117	240	0	0	30	292
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	Perm	NA
Protected Phases		8			4			6				2
Permitted Phases	8		8	4			6			2	2	
Actuated Green, G (s)	9.1	9.1	9.1	9.1	9.1		11.8	11.8			11.8	11.8
Effective Green, g (s)	9.1	9.1	9.1	9.1	9.1		11.8	11.8			11.8	11.8
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31		0.41	0.41			0.41	0.41
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	2.5
Lane Grp Cap (vph)	395	380	468	337	509		397	713			435	1326
v/s Ratio Prot					0.00			c0.14				0.09
v/s Ratio Perm	0.18	c0.19	0.02	0.00			0.12				0.03	
v/c Ratio	0.56	0.59	0.05	0.01	0.01		0.29	0.34			0.07	0.22
Uniform Delay, d1	8.2	8.3	6.9	6.8	6.8		5.8	5.9			5.2	5.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.5	1.9	0.0	0.0	0.0		0.3	0.2			0.0	0.1
Delay (s)	9.7	10.3	6.9	6.8	6.8		6.1	6.1			5.3	5.6
Level of Service	A	B	A	A	A		A	A			A	A
Approach Delay (s)		9.6			6.8			6.1				5.6
Approach LOS		A			A			A				A

Intersection Summary

HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	28.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1750
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	50
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection						
Int Delay, s/veh	6.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	85	85	125	155	65
Future Vol, veh/h	100	85	85	125	155	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	110	93	93	137	170	71

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	230	0	-	0	475 162
Stage 1	-	-	-	-	162 -
Stage 2	-	-	-	-	313 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1350	-	-	-	552 888
Stage 1	-	-	-	-	872 -
Stage 2	-	-	-	-	746 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1350	-	-	-	507 888
Mov Cap-2 Maneuver	-	-	-	-	545 -
Stage 1	-	-	-	-	801 -
Stage 2	-	-	-	-	746 -

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1350	-	-	-	615
HCM Lane V/C Ratio	0.081	-	-	-	0.393
HCM Control Delay (s)	7.9	-	-	-	14.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.9

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗		↖	↗	
Traffic Vol, veh/h	30	10	35	380	290	35
Future Vol, veh/h	30	10	35	380	290	35
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	80	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	4	1	2	0
Mvmt Flow	35	12	41	447	341	41

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	891	191	382	0	-	0
Stage 1	362	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Critical Hdwy	6.6	6.9	4.16	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.238	-	-	-
Pot Cap-1 Maneuver	300	825	1162	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	286	825	1162	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	595	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1162	-	286	825	-	-
HCM Lane V/C Ratio	0.035	-	0.123	0.014	-	-
HCM Control Delay (s)	8.2	0	19.4	9.4	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	5	195	385	40	15	5
Future Vol, veh/h	5	195	385	40	15	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	110	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	210	414	43	16	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	457	0	-	0	656 436
Stage 1	-	-	-	-	436 -
Stage 2	-	-	-	-	220 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1104	-	-	-	430 620
Stage 1	-	-	-	-	652 -
Stage 2	-	-	-	-	817 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1104	-	-	-	428 620
Mov Cap-2 Maneuver	-	-	-	-	428 -
Stage 1	-	-	-	-	649 -
Stage 2	-	-	-	-	817 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1104	-	-	-	428	620
HCM Lane V/C Ratio	0.005	-	-	-	0.038	0.009
HCM Control Delay (s)	8.3	0	-	-	13.7	10.9
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	65	25	2	70	30	2
Future Vol, veh/h	65	25	2	70	30	2
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	79	30	2	85	37	2

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	110	0	184
Stage 1	-	-	-	-	95
Stage 2	-	-	-	-	89
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1493	-	810
Stage 1	-	-	-	-	934
Stage 2	-	-	-	-	940
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1492	-	808
Mov Cap-2 Maneuver	-	-	-	-	808
Stage 1	-	-	-	-	932
Stage 2	-	-	-	-	940

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	816	-	-	1492	-
HCM Lane V/C Ratio	0.048	-	-	0.002	-
HCM Control Delay (s)	9.6	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	35	40	30	5	40	2	35	30	5	2	35	20
Future Vol, veh/h	35	40	30	5	40	2	35	30	5	2	35	20
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	3	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	38	44	33	5	44	2	38	33	5	2	38	22
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	7.9	7.6	7.9	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	33%	11%	4%
Vol Thru, %	43%	38%	85%	61%
Vol Right, %	7%	29%	4%	35%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	105	47	57
LT Vol	35	35	5	2
Through Vol	30	40	40	35
RT Vol	5	30	2	20
Lane Flow Rate	77	115	52	63
Geometry Grp	1	1	1	1
Degree of Util (X)	0.094	0.132	0.062	0.072
Departure Headway (Hd)	4.399	4.127	4.329	4.153
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	819	854	831	867
Service Time	2.399	2.223	2.337	2.157
HCM Lane V/C Ratio	0.094	0.135	0.063	0.073
HCM Control Delay	7.9	7.9	7.6	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.2	0.2

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	10	30	40	80	65	5
Future Vol, veh/h	10	30	40	80	65	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	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	34	45	90	73	6

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	256	76	79	0	0
Stage 1	76	-	-	-	-
Stage 2	180	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	737	991	1532	-	-
Stage 1	952	-	-	-	-
Stage 2	856	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	714	991	1532	-	-
Mov Cap-2 Maneuver	714	-	-	-	-
Stage 1	922	-	-	-	-
Stage 2	856	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	2.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1532	-	903	-	-
HCM Lane V/C Ratio	0.029	-	0.05	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

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	65	240	5	2	220	40	5	2	5	60	2	60
Future Vol, veh/h	65	240	5	2	220	40	5	2	5	60	2	60
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	69	255	5	2	234	43	5	2	5	64	2	64

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	277	0	0	260	0	0	689	677	258	659	658	256
Stage 1	-	-	-	-	-	-	396	396	-	260	260	-
Stage 2	-	-	-	-	-	-	293	281	-	399	398	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1298	-	-	1316	-	-	363	377	786	380	387	788
Stage 1	-	-	-	-	-	-	633	607	-	749	697	-
Stage 2	-	-	-	-	-	-	719	682	-	631	606	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1298	-	-	1316	-	-	316	353	786	357	362	788
Mov Cap-2 Maneuver	-	-	-	-	-	-	316	353	-	357	362	-
Stage 1	-	-	-	-	-	-	594	569	-	703	696	-
Stage 2	-	-	-	-	-	-	657	681	-	586	568	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.1	13.6	15
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	431	1298	-	-	1316	-	-	489
HCM Lane V/C Ratio	0.03	0.053	-	-	0.002	-	-	0.265
HCM Control Delay (s)	13.6	7.9	0	-	7.7	0	-	15
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	1.1

Intersection												
Int Delay, s/veh	8.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	130	140	2	140	20	110	120	20	10	100	10
Future Vol, veh/h	20	130	140	2	140	20	110	120	20	10	100	10
Conflicting Peds, #/hr	12	0	4	4	0	12	5	0	0	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	20	131	141	2	141	20	111	121	20	10	101	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	276	0	0	462	423	206	479	483	168
Stage 1	-	-	-	-	-	-	246	246	-	167	167	-
Stage 2	-	-	-	-	-	-	216	177	-	312	316	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1416	-	-	1299	-	-	513	526	840	500	486	881
Stage 1	-	-	-	-	-	-	762	706	-	840	764	-
Stage 2	-	-	-	-	-	-	791	756	-	703	659	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1400	-	-	1294	-	-	413	508	837	388	469	867
Mov Cap-2 Maneuver	-	-	-	-	-	-	413	508	-	388	469	-
Stage 1	-	-	-	-	-	-	746	691	-	816	754	-
Stage 2	-	-	-	-	-	-	672	746	-	556	645	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.1			20.9			15		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	475	1400	-	-	1294	-	-	479
HCM Lane V/C Ratio	0.532	0.014	-	-	0.002	-	-	0.253
HCM Control Delay (s)	20.9	7.6	0	-	7.8	0	-	15
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	3.1	0	-	-	0	-	-	1

HCM Signalized Intersection Capacity Analysis
880: Mill St & E St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕↕		↕	↑			↕		
Traffic Volume (vph)	0	0	0	55	700	15	50	55	0	0	45	40	
Future Volume (vph)	0	0	0	55	700	15	50	55	0	0	45	40	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)					4.0		4.0	4.0			4.0		
Lane Util. Factor					0.95		1.00	1.00			1.00		
Frt					1.00		1.00	1.00			0.94		
Flt Protected					1.00		0.95	1.00			1.00		
Satd. Flow (prot)					3304		1662	1750			1638		
Flt Permitted					1.00		0.74	1.00			1.00		
Satd. Flow (perm)					3304		1296	1750			1638		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	0	0	59	753	16	54	59	0	0	48	43	
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	36	0	
Lane Group Flow (vph)	0	0	0	0	826	0	54	59	0	0	55	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					6			8			4		
Permitted Phases				6			8						
Actuated Green, G (s)					19.5		4.4	4.4			4.4		
Effective Green, g (s)					20.5		5.4	5.4			5.4		
Actuated g/C Ratio					0.60		0.16	0.16			0.16		
Clearance Time (s)					5.0		5.0	5.0			5.0		
Vehicle Extension (s)					4.1		2.5	2.5			2.5		
Lane Grp Cap (vph)					1997		206	278			260		
v/s Ratio Prot								0.03			0.03		
v/s Ratio Perm					0.25		c0.04						
v/c Ratio					0.41		0.26	0.21			0.21		
Uniform Delay, d1					3.5		12.5	12.4			12.4		
Progression Factor					1.00		1.00	1.00			1.00		
Incremental Delay, d2					0.2		0.5	0.3			0.3		
Delay (s)					3.7		13.0	12.7			12.7		
Level of Service					A		B	B			B		
Approach Delay (s)		0.0			3.7			12.8			12.7		
Approach LOS		A			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			5.5		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.38										
Actuated Cycle Length (s)			33.9		Sum of lost time (s)						8.0		
Intersection Capacity Utilization			42.7%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
890: Mill St & F St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔↔						↔		↔	↔		
Traffic Volume (vph)	60	665	40	0	0	0	0	50	35	15	85	0	
Future Volume (vph)	60	665	40	0	0	0	0	50	35	15	85	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0						4.0		4.0	4.0		
Lane Util. Factor		0.95						1.00		1.00	1.00		
Frt		0.99						0.94		1.00	1.00		
Flt Protected		1.00						1.00		0.95	1.00		
Satd. Flow (prot)		3270						1624		1662	1750		
Flt Permitted		1.00						1.00		0.69	1.00		
Satd. Flow (perm)		3270						1624		1213	1750		
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	
Adj. Flow (vph)	70	773	47	0	0	0	0	58	41	17	99	0	
RTOR Reduction (vph)	0	4	0	0	0	0	0	33	0	0	0	0	
Lane Group Flow (vph)	0	886	0	0	0	0	0	66	0	17	99	0	
Heavy Vehicles (%)	0%	0%	9%	0%	0%	0%	0%	3%	0%	0%	0%	0%	
Turn Type	Perm	NA						NA		Perm	NA		
Protected Phases		2						8			4		
Permitted Phases	2									4			
Actuated Green, G (s)		19.2						6.1		6.1	6.1		
Effective Green, g (s)		20.2						7.1		7.1	7.1		
Actuated g/C Ratio		0.57						0.20		0.20	0.20		
Clearance Time (s)		5.0						5.0		5.0	5.0		
Vehicle Extension (s)		4.1						2.5		2.5	2.5		
Lane Grp Cap (vph)		1871						326		243	351		
v/s Ratio Prot								0.04			c0.06		
v/s Ratio Perm		0.27								0.01			
v/c Ratio		0.47						0.20		0.07	0.28		
Uniform Delay, d1		4.4						11.7		11.4	11.9		
Progression Factor		1.00						1.00		1.00	1.00		
Incremental Delay, d2		0.3						0.2		0.1	0.3		
Delay (s)		4.7						12.0		11.5	12.3		
Level of Service		A						B		B	B		
Approach Delay (s)		4.7			0.0			12.0			12.2		
Approach LOS		A			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			6.1									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.42										
Actuated Cycle Length (s)			35.3									Sum of lost time (s)	8.0
Intersection Capacity Utilization			42.7%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
900: Fire Mountain Wy & E St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↗		↖	↗	
Traffic Volume (vph)	115	510	10	5	635	90	50	20	55	80	5	115
Future Volume (vph)	115	510	10	5	635	90	50	20	55	80	5	115
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.89		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3310		1662	3235		1583	1558		1662	1498	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.71	1.00	
Satd. Flow (perm)	1662	3310		1662	3235		1128	1558		1236	1498	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	120	531	10	5	661	94	52	21	57	83	5	120
RTOR Reduction (vph)	0	1	0	0	10	0	0	48	0	0	102	0
Lane Group Flow (vph)	120	540	0	5	745	0	52	30	0	83	23	0
Heavy Vehicles (%)	0%	0%	10%	0%	1%	0%	5%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2		8			4		4
Permitted Phases							8			4		
Actuated Green, G (s)	7.6	33.6		0.8	26.8		8.5	8.5		8.5	8.5	
Effective Green, g (s)	7.6	33.6		0.8	26.8		8.5	8.5		8.5	8.5	
Actuated g/C Ratio	0.14	0.61		0.01	0.48		0.15	0.15		0.15	0.15	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.6		2.5	4.6		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	228	2007		24	1564		173	239		189	229	
v/s Ratio Prot	c0.07	0.16		0.00	c0.23			0.02			0.02	
v/s Ratio Perm							0.05			c0.07		
v/c Ratio	0.53	0.27		0.21	0.48		0.30	0.12		0.44	0.10	
Uniform Delay, d1	22.2	5.1		27.0	9.6		20.8	20.2		21.3	20.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.1		3.1	0.4		0.7	0.2		1.2	0.1	
Delay (s)	23.9	5.3		30.1	10.0		21.5	20.4		22.5	20.3	
Level of Service	C	A		C	B		C	C		C	C	
Approach Delay (s)		8.6			10.1			20.9			21.2	
Approach LOS		A			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.48	B
Actuated Cycle Length (s)	55.4	Sum of lost time (s)
Intersection Capacity Utilization	51.0%	12.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		A

HCM Signalized Intersection Capacity Analysis
910: M St & Mill St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	425	1	1	450	45	1	1	1	120	45	1
Future Volume (vph)	20	425	1	1	450	45	1	1	1	120	45	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	1.00			0.99			0.95		1.00	1.00	
Flt Protected	0.95	1.00			1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1554	1749			1707			1612		1614	1711	
Flt Permitted	0.49	1.00			1.00			0.92		0.76	1.00	
Satd. Flow (perm)	809	1749			1706			1506		1284	1711	
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.93	0.93	0.92	0.92	0.92	0.93	0.92	0.93
Adj. Flow (vph)	22	457	1	1	484	48	1	1	1	129	49	1
RTOR Reduction (vph)	0	0	0	0	7	0	0	1	0	0	1	0
Lane Group Flow (vph)	22	458	0	0	526	0	0	2	0	129	49	0
Heavy Vehicles (%)	7%	0%	2%	2%	0%	14%	2%	2%	2%	3%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	22.1	22.1			22.1			7.0		7.0	7.0	
Effective Green, g (s)	23.1	23.1			23.1			7.0		7.0	7.0	
Actuated g/C Ratio	0.61	0.61			0.61			0.18		0.18	0.18	
Clearance Time (s)	5.0	5.0			5.0			4.0		4.0	4.0	
Vehicle Extension (s)	4.1	4.1			4.1			2.5		2.5	2.5	
Lane Grp Cap (vph)	490	1060			1034			276		235	314	
v/s Ratio Prot		0.26									0.03	
v/s Ratio Perm	0.03				c0.31			0.00		c0.10		
v/c Ratio	0.04	0.43			0.51			0.01		0.55	0.16	
Uniform Delay, d1	3.0	4.0			4.3			12.7		14.1	13.1	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4			0.6			0.0		2.1	0.2	
Delay (s)	3.1	4.4			4.8			12.7		16.2	13.2	
Level of Service	A	A			A			B		B	B	
Approach Delay (s)		4.3			4.8			12.7			15.4	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	38.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	345	120	5	505	2	40	2	5	2	2	5
Future Vol, veh/h	5	345	120	5	505	2	40	2	5	2	2	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	67	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	5	375	130	5	549	2	43	2	5	2	2	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	551	0	0	505	0	0	1014	1011	440	1014	1075	550
Stage 1	-	-	-	-	-	-	450	450	-	560	560	-
Stage 2	-	-	-	-	-	-	564	561	-	454	515	-
Critical Hdwy	4.77	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.803	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	761	-	-	1070	-	-	219	241	621	219	221	539
Stage 1	-	-	-	-	-	-	592	575	-	516	514	-
Stage 2	-	-	-	-	-	-	514	513	-	589	538	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	761	-	-	1070	-	-	212	237	621	213	217	539
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	237	-	213	217	-
Stage 1	-	-	-	-	-	-	587	570	-	511	510	-
Stage 2	-	-	-	-	-	-	503	509	-	576	533	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.1			25.2			16.5		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	229	761	-	-	1070	-	-	323
HCM Lane V/C Ratio	0.223	0.007	-	-	0.005	-	-	0.03
HCM Control Delay (s)	25.2	9.8	0	-	8.4	0	-	16.5
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0.1

Intersection	
Intersection Delay, s/veh	24.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	55	80	125	70	85	105	105	265	80	125	215	45
Future Vol, veh/h	55	80	125	70	85	105	105	265	80	125	215	45
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0	3	0	1	2	0	3	2	3
Mvmt Flow	60	88	137	77	93	115	115	291	88	137	236	49
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	25.2	16.7	30.7	20.5
HCM LOS	D	C	D	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	21%	100%	0%	100%	0%
Vol Thru, %	0%	77%	31%	0%	45%	0%	83%
Vol Right, %	0%	23%	48%	0%	55%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	345	260	70	190	125	260
LT Vol	105	0	55	70	0	125	0
Through Vol	0	265	80	0	85	0	215
RT Vol	0	80	125	0	105	0	45
Lane Flow Rate	115	379	286	77	209	137	286
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.268	0.809	0.649	0.191	0.469	0.326	0.626
Departure Headway (Hd)	8.35	7.683	8.178	8.954	8.088	8.553	7.892
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	430	470	443	401	445	420	457
Service Time	6.093	5.426	6.224	6.703	5.837	6.301	5.64
HCM Lane V/C Ratio	0.267	0.806	0.646	0.192	0.47	0.326	0.626
HCM Control Delay	14.1	35.7	25.2	13.8	17.8	15.4	23
HCM Lane LOS	B	E	D	B	C	C	C
HCM 95th-tile Q	1.1	7.6	4.5	0.7	2.4	1.4	4.2

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	245	30	2	195	25	2
Future Vol, veh/h	245	30	2	195	25	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	0	100	0	0	0
Mvmt Flow	282	34	2	224	29	2

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	316	0	527 299
Stage 1	-	-	-	-	299 -
Stage 2	-	-	-	-	228 -
Critical Hdwy	-	-	5.1	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	3.1	-	3.5 3.3
Pot Cap-1 Maneuver	-	-	848	-	515 745
Stage 1	-	-	-	-	757 -
Stage 2	-	-	-	-	815 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	848	-	513 745
Mov Cap-2 Maneuver	-	-	-	-	513 -
Stage 1	-	-	-	-	755 -
Stage 2	-	-	-	-	815 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	525	-	-	848	-
HCM Lane V/C Ratio	0.059	-	-	0.003	-
HCM Control Delay (s)	12.3	-	-	9.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	35	340	20	50	415
Future Vol, veh/h	25	35	340	20	50	415
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	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	92
Heavy Vehicles, %	0	0	2	0	3	1
Mvmt Flow	28	39	378	22	56	451

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	952	389	0	0	400
Stage 1	389	-	-	-	-
Stage 2	563	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227
Pot Cap-1 Maneuver	290	664	-	-	1153
Stage 1	689	-	-	-	-
Stage 2	574	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	276	664	-	-	1153
Mov Cap-2 Maneuver	276	-	-	-	-
Stage 1	655	-	-	-	-
Stage 2	574	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	419	1153
HCM Lane V/C Ratio	-	-	0.159	0.048
HCM Control Delay (s)	-	-	15.2	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2

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	15	2	5	95	5	100	5	70	70	155	100	20
Future Vol, veh/h	15	2	5	95	5	100	5	70	70	155	100	20
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	35	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	16	2	5	103	5	109	5	76	76	168	109	22

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	637	618	120	584	591	114	131	0	0	152	0	0
Stage 1	456	456	-	124	124	-	-	-	-	-	-	-
Stage 2	181	162	-	460	467	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	393	408	937	426	422	944	1467	-	-	1441	-	-
Stage 1	588	572	-	885	797	-	-	-	-	-	-	-
Stage 2	825	768	-	585	565	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	312	359	937	383	371	944	1467	-	-	1441	-	-
Mov Cap-2 Maneuver	312	359	-	383	371	-	-	-	-	-	-	-
Stage 1	586	505	-	882	795	-	-	-	-	-	-	-
Stage 2	723	766	-	512	499	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.3		13.7		0.3		4.4	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1467	-	-	373	382	944	1441	-	-
HCM Lane V/C Ratio	0.004	-	-	0.064	0.285	0.115	0.117	-	-
HCM Control Delay (s)	7.5	-	-	15.3	18.1	9.3	7.8	-	-
HCM Lane LOS	A	-	-	C	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.2	0.4	0.4	-	-

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	150	235	5	55	5
Future Vol, veh/h	10	150	235	5	55	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	11	160	250	5	59	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	255	0	-	0	435 253
Stage 1	-	-	-	-	253 -
Stage 2	-	-	-	-	182 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1322	-	-	-	582 791
Stage 1	-	-	-	-	794 -
Stage 2	-	-	-	-	854 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1322	-	-	-	577 791
Mov Cap-2 Maneuver	-	-	-	-	577 -
Stage 1	-	-	-	-	787 -
Stage 2	-	-	-	-	854 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1322	-	-	-	590
HCM Lane V/C Ratio	0.008	-	-	-	0.108
HCM Control Delay (s)	7.7	0	-	-	11.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection						
Int Delay, s/veh	5.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	160	45	45	100	140	55
Future Vol, veh/h	160	45	45	100	140	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	170	48	48	106	149	59

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	218	0	396
Stage 1	-	-	-	-	194
Stage 2	-	-	-	-	202
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1364	-	613
Stage 1	-	-	-	-	844
Stage 2	-	-	-	-	837
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1364	-	590
Mov Cap-2 Maneuver	-	-	-	-	590
Stage 1	-	-	-	-	813
Stage 2	-	-	-	-	837

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1364	-
HCM Lane V/C Ratio	0.321	-	-	0.035	-
HCM Control Delay (s)	13.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.1	-

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	15	125	85	35	55	35
Future Vol, veh/h	15	125	85	35	55	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	17	144	98	40	63	40

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	138	0	-	0	296 118
Stage 1	-	-	-	-	118 -
Stage 2	-	-	-	-	178 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1458	-	-	-	699 939
Stage 1	-	-	-	-	912 -
Stage 2	-	-	-	-	858 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1458	-	-	-	690 939
Mov Cap-2 Maneuver	-	-	-	-	690 -
Stage 1	-	-	-	-	900 -
Stage 2	-	-	-	-	858 -

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1458	-	-	-	769
HCM Lane V/C Ratio	0.012	-	-	-	0.135
HCM Control Delay (s)	7.5	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	1	0	2
Stage 1	-	-	-	-	1
Stage 2	-	-	-	-	1
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1622	-	1021
Stage 1	-	-	-	-	1022
Stage 2	-	-	-	-	1022
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1622	-	1021
Mov Cap-2 Maneuver	-	-	-	-	1021
Stage 1	-	-	-	-	1022
Stage 2	-	-	-	-	1022

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1622	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	20	70	45	115	225	20
Future Vol, veh/h	20	70	45	115	225	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	24	85	55	140	274	24

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	536	286	298	0	0
Stage 1	286	-	-	-	-
Stage 2	250	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	509	758	1275	-	-
Stage 1	767	-	-	-	-
Stage 2	796	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	485	758	1275	-	-
Mov Cap-2 Maneuver	485	-	-	-	-
Stage 1	731	-	-	-	-
Stage 2	796	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1275	-	674	-	-
HCM Lane V/C Ratio	0.043	-	0.163	-	-
HCM Control Delay (s)	8	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	15	5	150	5	5	190
Future Vol, veh/h	15	5	150	5	5	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	17	6	169	6	6	213

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	397	172	0	0	175	0
Stage 1	172	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	612	877	-	-	1414	-
Stage 1	863	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	609	877	-	-	1414	-
Mov Cap-2 Maneuver	609	-	-	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	659	1414
HCM Lane V/C Ratio	-	-	0.034	0.004
HCM Control Delay (s)	-	-	10.7	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗				↑
Traffic Vol, veh/h	245	210	0	0	0	150
Future Vol, veh/h	245	210	0	0	0	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	5	1	0	0	0	2
Mvmt Flow	282	241	0	0	0	172

Major/Minor	Minor1		Major2	
Conflicting Flow All	172	0	-	-
Stage 1	0	-	-	-
Stage 2	172	-	-	-
Critical Hdwy	6.45	6.21	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-
Follow-up Hdwy	3.545	3.309	-	-
Pot Cap-1 Maneuver	811	-	0	-
Stage 1	-	-	0	-
Stage 2	851	-	0	-
Platoon blocked, %				
Mov Cap-1 Maneuver	811	-	-	-
Mov Cap-2 Maneuver	811	-	-	-
Stage 1	-	-	-	-
Stage 2	851	-	-	-

Approach	WB	SB
HCM Control Delay, s		0
HCM LOS	-	

Minor Lane/Major Mvmt	WBLn1WBLn2	SBT
Capacity (veh/h)	811	-
HCM Lane V/C Ratio	0.347	-
HCM Control Delay (s)	11.8	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	1.6	-

Intersection						
Int Delay, s/veh	4.6					
Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	350	225	0
Future Vol, veh/h	0	0	0	350	225	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	380	245	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 190
Stage 1	-	- 0
Stage 2	-	- 190
Critical Hdwy	-	- 6.84
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.84
Follow-up Hdwy	-	- 3.52
Pot Cap-1 Maneuver	0	- 781
Stage 1	0	- - 0
Stage 2	0	- 823
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 781
Mov Cap-2 Maneuver	-	- 781
Stage 1	-	- -
Stage 2	-	- 823

Approach	WB	NE
HCM Control Delay, s	0	11.7
HCM LOS		B

Minor Lane/Major Mvmt	NELn1	WBT
Capacity (veh/h)	781	-
HCM Lane V/C Ratio	0.313	-
HCM Control Delay (s)	11.7	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	1.3	-

HCM Signalized Intersection Capacity Analysis
 40: 6th St/I-5 SB Off-Ramp & Morgan Ln & Scoville Rd

Baseline 2018 PM Peak
 12/05/2018



Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations	↑	↑	↑	↑		↑↓			↑↓	
Traffic Volume (vph)	145	230	160	240	20	540	30	40	270	85
Future Volume (vph)	145	230	160	240	20	540	30	40	270	85
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00		0.95			0.97	
Frpb, ped/bikes	1.00	0.98	1.00	1.00		1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.85	1.00	1.00		0.99			0.97	
Flt Protected	1.00	1.00	0.95	1.00		1.00			0.96	
Satd. Flow (prot)	1699	1417	1628	1667		3202			3061	
Flt Permitted	1.00	1.00	0.38	1.00		1.00			0.96	
Satd. Flow (perm)	1699	1417	651	1667		3202			3061	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	148	235	163	245	20	551	31	41	276	87
RTOR Reduction (vph)	0	203	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	148	32	163	245	0	599	0	0	404	0
Confl. Peds. (#/hr)		3	3		2		2	2		2
Heavy Vehicles (%)	3%	3%	2%	5%	0%	3%	0%	0%	4%	0%
Turn Type	NA	Perm	pm+pt	NA	Split	NA		Prot	Prot	
Protected Phases	8		7	4	2	2		6	6	
Permitted Phases		8	4							
Actuated Green, G (s)	11.5	11.5	30.1	30.1		24.1			18.8	
Effective Green, g (s)	12.0	12.0	30.6	30.6		25.5			20.2	
Actuated g/C Ratio	0.14	0.14	0.35	0.35		0.29			0.23	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.4			5.4	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		4.4			4.3	
Lane Grp Cap (vph)	230	192	387	577		924			700	
v/s Ratio Prot	c0.09		0.07	c0.15		c0.19			c0.13	
v/s Ratio Perm		0.02	0.08							
v/c Ratio	0.64	0.17	0.42	0.42		0.65			0.58	
Uniform Delay, d1	36.1	33.7	21.3	22.1		27.5			30.3	
Progression Factor	1.00	1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	5.4	0.3	0.5	0.4		1.9			1.5	
Delay (s)	41.5	34.0	21.8	22.5		29.4			31.8	
Level of Service	D	C	C	C		C			C	
Approach Delay (s)	36.9			22.2		29.4			31.8	
Approach LOS	D			C		C			C	

Intersection Summary

HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	18.8
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
50: 7th St & Morgan Ln/I-5 SB On-Ramp

Baseline 2018 PM Peak
12/05/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	145	0	0	0	0	395	700	245	0	0	0
Future Volume (vph)	65	145	0	0	0	0	395	700	245	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0						4.0	4.0			
Lane Util. Factor	1.00	1.00						0.95	1.00			
Frbp, ped/bikes	1.00	1.00						1.00	0.98			
Flpb, ped/bikes	1.00	1.00						1.00	1.00			
Frt	1.00	1.00						1.00	0.85			
Flt Protected	0.95	1.00						0.98	1.00			
Satd. Flow (prot)	1624	1716						3186	1424			
Flt Permitted	0.95	1.00						0.98	1.00			
Satd. Flow (perm)	1624	1716						3186	1424			
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	76	169	0	0	0	0	459	814	285	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	107	0	0	0
Lane Group Flow (vph)	76	169	0	0	0	0	0	1273	178	0	0	0
Confl. Peds. (#/hr)	5							3	3			
Heavy Vehicles (%)	2%	2%	0%	0%	0%	0%	3%	2%	2%	0%	0%	0%
Turn Type	Perm	NA					Perm	NA	Perm			
Protected Phases		4						2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	9.3	9.3						28.3	28.3			
Effective Green, g (s)	9.8	9.8						29.8	29.8			
Actuated g/C Ratio	0.21	0.21						0.63	0.63			
Clearance Time (s)	4.5	4.5						5.5	5.5			
Vehicle Extension (s)	2.5	2.5						5.2	5.2			
Lane Grp Cap (vph)	334	353						1994	891			
v/s Ratio Prot		c0.10										
v/s Ratio Perm	0.05							0.40	0.13			
v/c Ratio	0.23	0.48						0.64	0.20			
Uniform Delay, d1	15.7	16.6						5.5	3.8			
Progression Factor	1.00	1.00						1.00	1.00			
Incremental Delay, d2	0.3	0.7						1.0	0.2			
Delay (s)	16.0	17.4						6.5	4.1			
Level of Service	B	B						A	A			
Approach Delay (s)		17.0			0.0			6.1			0.0	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.6					HCM 2000 Level of Service		A		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			47.6					Sum of lost time (s)		8.0		
Intersection Capacity Utilization			48.4%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
60: 6th St & Hillcrest Dr

Baseline 2018 PM Peak
12/05/2018






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻		↻	↻						↻↻↻	
Traffic Volume (vph)	0	80	130	180	145	0	0	0	0	150	1010	40
Future Volume (vph)	0	80	130	180	145	0	0	0	0	150	1010	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.91	
Frbp, ped/bikes		0.99		1.00	1.00						1.00	
Flpb, ped/bikes		1.00		1.00	1.00						1.00	
Frt		0.92		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1579		1662	1750						4715	
Flt Permitted		1.00		0.62	1.00						0.99	
Satd. Flow (perm)		1579		1085	1750						4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	84	137	189	153	0	0	0	0	158	1063	42
RTOR Reduction (vph)	0	46	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	175	0	189	153	0	0	0	0	0	1257	0
Confl. Peds. (#/hr)			1	1								1
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Turn Type		NA		Perm	NA						Perm	NA
Protected Phases		8			4							6
Permitted Phases				4						6		
Actuated Green, G (s)		13.5		13.5	13.5						18.6	
Effective Green, g (s)		13.5		13.5	13.5						18.6	
Actuated g/C Ratio		0.34		0.34	0.34						0.46	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Vehicle Extension (s)		2.5		2.5	2.5						3.9	
Lane Grp Cap (vph)		531		365	589						2187	
v/s Ratio Prot		0.11			0.09							
v/s Ratio Perm				c0.17							0.27	
v/c Ratio		0.33		0.52	0.26						0.57	
Uniform Delay, d1		9.9		10.7	9.7						7.9	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		0.3		0.9	0.2						0.4	
Delay (s)		10.2		11.6	9.8						8.3	
Level of Service		B		B	A						A	
Approach Delay (s)		10.2			10.8			0.0			8.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.0			HCM 2000 Level of Service					A	
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			40.1			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			59.9%			ICU Level of Service					B	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
70: 7th St & Hillcrest Dr

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	80	0	0	65	70	245	1310	50	0	0	0
Future Volume (vph)	150	80	0	0	65	70	245	1310	50	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0				
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91				
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00				
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		1.00				
Flt Protected	0.95	1.00			1.00	1.00		0.99				
Satd. Flow (prot)	1610	1750			1750	1465		4674				
Flt Permitted	0.71	1.00			1.00	1.00		0.99				
Satd. Flow (perm)	1200	1750			1750	1465		4674				
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	172	92	0	0	75	80	282	1506	57	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	23	0	4	0	0	0	0
Lane Group Flow (vph)	172	92	0	0	75	57	0	1841	0	0	0	0
Confl. Peds. (#/hr)	4					4	4		6			
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8					4	2					
Actuated Green, G (s)	12.9	12.9			12.9	12.9		30.5				
Effective Green, g (s)	12.9	12.9			12.9	12.9		31.5				
Actuated g/C Ratio	0.25	0.25			0.25	0.25		0.60				
Clearance Time (s)	4.0	4.0			4.0	4.0		5.0				
Vehicle Extension (s)	2.5	2.5			2.5	2.5		5.0				
Lane Grp Cap (vph)	295	430			430	360		2809				
v/s Ratio Prot		0.05			0.04							
v/s Ratio Perm	c0.14					0.04		0.39				
v/c Ratio	0.58	0.21			0.17	0.16		0.66				
Uniform Delay, d1	17.4	15.7			15.6	15.5		6.9				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	2.4	0.2			0.1	0.1		0.8				
Delay (s)	19.8	15.9			15.7	15.6		7.6				
Level of Service	B	B			B	B		A				
Approach Delay (s)		18.4			15.7			7.6			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.4				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			52.4				Sum of lost time (s)		8.0			
Intersection Capacity Utilization			59.9%				ICU Level of Service		B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
80: 6th St & Savage St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖						↖↗↘	
Traffic Volume (vph)	0	65	50	145	70	0	0	0	0	85	1395	35
Future Volume (vph)	0	65	50	145	70	0	0	0	0	85	1395	35
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.91	
Frt		0.94		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1648		1662	1750						4748	
Flt Permitted		1.00		0.66	1.00						1.00	
Satd. Flow (perm)		1648		1162	1750						4748	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	68	52	151	73	0	0	0	0	89	1453	36
RTOR Reduction (vph)	0	34	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	86	0	151	73	0	0	0	0	0	1576	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA						Perm	NA
Protected Phases		8			4							6
Permitted Phases				4						6		
Actuated Green, G (s)		14.3		14.3	14.3						52.7	
Effective Green, g (s)		14.3		14.3	14.3						52.7	
Actuated g/C Ratio		0.19		0.19	0.19						0.70	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Vehicle Extension (s)		2.5		2.5	2.5						0.2	
Lane Grp Cap (vph)		314		221	333						3336	
v/s Ratio Prot		0.05			0.04							
v/s Ratio Perm				0.13							0.33	
v/c Ratio		0.27		0.68	0.22						0.47	
Uniform Delay, d1		25.9		28.2	25.6						5.0	
Progression Factor		1.00		0.91	0.87						1.00	
Incremental Delay, d2		0.3		7.4	0.2						0.5	
Delay (s)		26.3		33.0	22.6						5.4	
Level of Service		C		C	C						A	
Approach Delay (s)		26.3			29.6			0.0			5.4	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.6		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			57.7%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
90: 7th St & Savage St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑			↗			↖↗↘				
Traffic Volume (vph)	85	95	0	0	60	55	120	1365	55	0	0	0
Future Volume (vph)	85	95	0	0	60	55	120	1365	55	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.94			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1662	1750			1637			4692				
Flt Permitted	0.61	1.00			1.00			1.00				
Satd. Flow (perm)	1076	1750			1637			4692				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	103	0	0	65	60	130	1484	60	0	0	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	3	0	0	0	0
Lane Group Flow (vph)	92	103	0	0	91	0	0	1671	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8						2					
Actuated Green, G (s)	9.6	9.6			9.6			57.4				
Effective Green, g (s)	9.6	9.6			9.6			57.4				
Actuated g/C Ratio	0.13	0.13			0.13			0.77				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Vehicle Extension (s)	2.5	2.5			2.5			0.2				
Lane Grp Cap (vph)	137	224			209			3590				
v/s Ratio Prot		0.06			0.06							
v/s Ratio Perm	c0.09							0.36				
v/c Ratio	0.67	0.46			0.44			0.47				
Uniform Delay, d1	31.2	30.3			30.2			3.2				
Progression Factor	1.02	1.02			1.00			0.82				
Incremental Delay, d2	10.8	1.1			1.1			0.4				
Delay (s)	42.7	32.0			31.3			3.1				
Level of Service	D	C			C			A				
Approach Delay (s)		37.1			31.3			3.1			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
100: 6th St & Evelyn Ave

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔						↔↔↔		
Traffic Volume (vph)	0	10	25	40	20	0	0	0	0	30	1600	40	
Future Volume (vph)	0	10	25	40	20	0	0	0	0	30	1600	40	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0			4.0						4.0		
Lane Util. Factor		1.00			1.00						0.91		
Frt		0.90			1.00						1.00		
Flt Protected		1.00			0.97						1.00		
Satd. Flow (prot)		1582			1694						4756		
Flt Permitted		1.00			0.78						1.00		
Satd. Flow (perm)		1582			1361						4756		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	11	27	43	22	0	0	0	0	33	1739	43	
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	2	0	
Lane Group Flow (vph)	0	19	0	0	65	0	0	0	0	0	1813	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type		NA		Perm	NA						Perm	NA	
Protected Phases		8			4							6	
Permitted Phases				4						6			
Actuated Green, G (s)		7.8			7.8						59.2		
Effective Green, g (s)		7.8			7.8						59.2		
Actuated g/C Ratio		0.10			0.10						0.79		
Clearance Time (s)		4.0			4.0						4.0		
Vehicle Extension (s)		2.5			2.5						0.2		
Lane Grp Cap (vph)		164			141						3754		
v/s Ratio Prot		0.01											
v/s Ratio Perm					0.05							0.38	
v/c Ratio		0.12			0.46							0.48	
Uniform Delay, d1		30.5			31.6							2.7	
Progression Factor		1.00			0.63							0.84	
Incremental Delay, d2		0.2			1.6							0.4	
Delay (s)		30.7			21.5							2.7	
Level of Service		C			C							A	
Approach Delay (s)		30.7			21.5			0.0				2.7	
Approach LOS		C			C			A				A	
Intersection Summary													
HCM 2000 Control Delay			3.9									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.48										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			52.1%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↖↖	
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	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	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Minor2		Major2	
Conflicting Flow All	-	1	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.32	-	-
Pot Cap-1 Maneuver	0	1083	-	0
Stage 1	0	-	-	0
Stage 2	0	-	-	0
Platoon blocked, %			-	
Mov Cap-1 Maneuver	-	1083	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

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

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

HCM Signalized Intersection Capacity Analysis
110: 7th St & Evelyn Ave

Baseline 2018 PM Peak
12/05/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↵	↑↑↑			
Traffic Volume (vph)	0	22	1440	15	0	0
Future Volume (vph)	0	22	1440	15	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		1.00	0.91			
Frt		0.86	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1514	4724			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1514	4724			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	24	1582	16	0	0
RTOR Reduction (vph)	0	23	1	0	0	0
Lane Group Flow (vph)	0	1	1597	0	0	0
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Turn Type		Prot	NA			
Protected Phases		8	2			
Permitted Phases						
Actuated Green, G (s)		2.0	55.3			
Effective Green, g (s)		2.0	55.3			
Actuated g/C Ratio		0.03	0.74			
Clearance Time (s)		4.0	4.0			
Vehicle Extension (s)		0.2	0.2			
Lane Grp Cap (vph)		40	3483			
v/s Ratio Prot		c0.00	c0.34			
v/s Ratio Perm						
v/c Ratio		0.02	0.46			
Uniform Delay, d1		35.5	3.9			
Progression Factor		1.00	1.83			
Incremental Delay, d2		0.1	0.4			
Delay (s)		35.6	7.5			
Level of Service		D	A			
Approach Delay (s)	35.6		7.5		0.0	
Approach LOS	D		A		A	
Intersection Summary						
HCM 2000 Control Delay			7.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			41.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
115: 7th St & Evelyn Ave

Baseline 2018 PM Peak
12/05/2018















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶			↷↷↷		
Traffic Volume (vph)	45	0	67	1395	0	0
Future Volume (vph)	45	0	67	1395	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0			4.0		
Lane Util. Factor	1.00			0.91		
Fr _t	1.00			1.00		
Fl _t Protected	0.95			1.00		
Satd. Flow (prot)	1662			4721		
Fl _t Permitted	0.95			1.00		
Satd. Flow (perm)	1662			4721		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	49	0	74	1533	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	49	0	0	1607	0	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%
Turn Type	Prot		Split	NA		
Protected Phases	4		2	2		
Permitted Phases						
Actuated Green, G (s)	5.7			55.3		
Effective Green, g (s)	5.7			55.3		
Actuated g/C Ratio	0.08			0.74		
Clearance Time (s)	4.0			4.0		
Vehicle Extension (s)	0.2			0.2		
Lane Grp Cap (vph)	126			3480		
v/s Ratio Prot	c0.03			c0.34		
v/s Ratio Perm						
v/c Ratio	0.39			0.46		
Uniform Delay, d ₁	33.0			3.9		
Progression Factor	1.06			0.09		
Incremental Delay, d ₂	0.7			0.4		
Delay (s)	35.5			0.7		
Level of Service	D			A		
Approach Delay (s)	35.5			0.7	0.0	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			




















HCM Signalized Intersection Capacity Analysis
120: 6th St & A St

Baseline 2018 PM Peak
12/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗	
Traffic Volume (vph)	0	165	135	130	215	0	0	0	0	105	1595	95	
Future Volume (vph)	0	165	135	130	215	0	0	0	0	105	1595	95	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00	
Frt		1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00						1.00	1.00	
Satd. Flow (prot)		1750	1488	1662	1750						4763	1488	
Flt Permitted		1.00	1.00	0.45	1.00						1.00	1.00	
Satd. Flow (perm)		1750	1488	784	1750						4763	1488	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	179	147	141	234	0	0	0	0	114	1734	103	
RTOR Reduction (vph)	0	0	97	0	0	0	0	0	0	0	0	41	
Lane Group Flow (vph)	0	179	50	141	234	0	0	0	0	0	1848	62	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type		NA	Perm	pm+pt	NA						Perm	NA	Perm
Protected Phases		4		3	8							6	
Permitted Phases			4	8						6			6
Actuated Green, G (s)		17.0	17.0	34.4	34.4						32.6	32.6	
Effective Green, g (s)		17.0	17.0	34.4	34.4						32.6	32.6	
Actuated g/C Ratio		0.23	0.23	0.46	0.46						0.43	0.43	
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0	
Vehicle Extension (s)		0.2	0.2	0.2	0.2						0.2	0.2	
Lane Grp Cap (vph)		396	337	516	802						2070	646	
v/s Ratio Prot		c0.10		0.05	c0.13								
v/s Ratio Perm			0.03	0.08							0.39	0.04	
v/c Ratio		0.45	0.15	0.27	0.29						0.89	0.10	
Uniform Delay, d1		25.0	23.2	12.3	12.7						19.6	12.5	
Progression Factor		1.00	1.00	1.12	1.15						1.06	1.46	
Incremental Delay, d2		3.7	0.9	1.1	0.8						6.0	0.3	
Delay (s)		28.7	24.1	14.9	15.3						26.8	18.5	
Level of Service		C	C	B	B						C	B	
Approach Delay (s)		26.6			15.2			0.0			26.4		
Approach LOS		C			B			A			C		
Intersection Summary													
HCM 2000 Control Delay			24.8			HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.65										
Actuated Cycle Length (s)			75.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization			63.0%			ICU Level of Service					B		
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
130: 7th St & A St

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	185	0	0	195	70	160	1300	120	0	0	0
Future Volume (vph)	80	185	0	0	195	70	160	1300	120	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0				
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91				
Frt	1.00	1.00			1.00	0.85		0.99				
Flt Protected	0.95	1.00			1.00	1.00		0.99				
Satd. Flow (prot)	1662	1750			1750	1488		4661				
Flt Permitted	0.63	1.00			1.00	1.00		0.99				
Satd. Flow (perm)	1096	1750			1750	1488		4661				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	86	199	0	0	210	75	172	1398	129	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	62	0	11	0	0	0	0
Lane Group Flow (vph)	86	199	0	0	210	13	0	1688	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	custom	NA			NA	Perm	Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	7					8	2					
Actuated Green, G (s)	8.4	23.9			11.5	11.5		43.1				
Effective Green, g (s)	8.4	23.9			11.5	11.5		43.1				
Actuated g/C Ratio	0.11	0.32			0.15	0.15		0.57				
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0				
Vehicle Extension (s)	0.2	0.2			0.2	0.2		0.2				
Lane Grp Cap (vph)	122	557			268	228		2678				
v/s Ratio Prot		0.11			c0.12							
v/s Ratio Perm	c0.08					0.01		0.36				
v/c Ratio	0.70	0.36			0.78	0.06		0.63				
Uniform Delay, d1	32.1	19.6			30.6	27.1		10.6				
Progression Factor	0.97	0.92			1.00	1.00		1.20				
Incremental Delay, d2	11.6	0.1			12.9	0.0		1.0				
Delay (s)	42.9	18.2			43.4	27.2		13.7				
Level of Service	D	B			D	C		B				
Approach Delay (s)		25.6			39.2			13.7			0.0	
Approach LOS		C			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			18.4				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			63.0%				ICU Level of Service		B			
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
140: 6th St & D St


















Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔↔↔	
Traffic Volume (vph)	0	110	60	75	130	0	0	0	0	95	1710	30
Future Volume (vph)	0	110	60	75	130	0	0	0	0	95	1710	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						0.91	
Frt		0.95			1.00						1.00	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1667			1718						4753	
Flt Permitted		1.00			0.83						1.00	
Satd. Flow (perm)		1667			1454						4753	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	120	65	82	141	0	0	0	0	103	1859	33
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	178	0	0	223	0	0	0	0	0	1993	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						6	
Permitted Phases				4						6		
Actuated Green, G (s)		26.0			26.0						41.0	
Effective Green, g (s)		26.0			26.0						41.0	
Actuated g/C Ratio		0.35			0.35						0.55	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		0.2			0.2						0.2	
Lane Grp Cap (vph)		577			504						2598	
v/s Ratio Prot		0.11										
v/s Ratio Perm					0.15						0.42	
v/c Ratio		0.31			0.44						0.77	
Uniform Delay, d1		17.9			18.9						13.3	
Progression Factor		1.00			0.74						0.25	
Incremental Delay, d2		1.4			2.5						1.5	
Delay (s)		19.3			16.6						4.8	
Level of Service		B			B						A	
Approach Delay (s)		19.3			16.6			0.0			4.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.0			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			75.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			70.9%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
150: 7th St & D St

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Traffic Volume (vph)	30	175	0	0	150	90	65	1455	70	0	0	0
Future Volume (vph)	30	175	0	0	150	90	65	1455	70	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.91				
Frt		1.00			0.95			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		1737			1661			4693				
Flt Permitted		0.77			1.00			1.00				
Satd. Flow (perm)		1340			1661			4693				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	32	188	0	0	161	97	70	1565	75	0	0	0
RTOR Reduction (vph)	0	0	0	0	18	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	220	0	0	240	0	0	1706	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8						2					
Actuated Green, G (s)		14.7			14.7			52.3				
Effective Green, g (s)		14.7			14.7			52.3				
Actuated g/C Ratio		0.20			0.20			0.70				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		262			325			3272				
v/s Ratio Prot					0.14							
v/s Ratio Perm		c0.16						0.36				
v/c Ratio		0.84			0.74			0.52				
Uniform Delay, d1		29.0			28.3			5.4				
Progression Factor		0.90			1.00			0.22				
Incremental Delay, d2		17.4			7.4			0.5				
Delay (s)		43.4			35.7			1.7				
Level of Service		D			D			A				
Approach Delay (s)		43.4			35.7			1.7			0.0	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.9				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		8.0			
Intersection Capacity Utilization			70.0%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
160: 6th St & E St













Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	305	360	0	0	0	0	0	1810	125
Future Volume (vph)	0	0	0	305	360	0	0	0	0	0	1810	125
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)				4.0	4.0						4.0	
Lane Util. Factor				0.91	0.91						0.91	
Frt				1.00	1.00						0.99	
Flt Protected				0.95	0.99						1.00	
Satd. Flow (prot)				1513	3154						4731	
Flt Permitted				0.95	0.99						1.00	
Satd. Flow (perm)				1513	3154						4731	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	335	396	0	0	0	0	0	1989	137
RTOR Reduction (vph)	0	0	0	10	10	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	228	483	0	0	0	0	0	2116	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA						NA	
Protected Phases					8						6	
Permitted Phases				8								
Actuated Green, G (s)				26.0	26.0						41.0	
Effective Green, g (s)				26.0	26.0						41.0	
Actuated g/C Ratio				0.35	0.35						0.55	
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				0.2	0.2						0.2	
Lane Grp Cap (vph)				524	1093						2586	
v/s Ratio Prot											c0.45	
v/s Ratio Perm				0.15	0.15							
v/c Ratio				0.44	0.44						0.82	
Uniform Delay, d1				18.9	18.9						13.9	
Progression Factor				0.66	0.67						0.40	
Incremental Delay, d2				2.2	1.1						2.1	
Delay (s)				14.6	13.8						7.7	
Level of Service				B	B						A	
Approach Delay (s)		0.0			14.0			0.0			7.7	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.3		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)			8.0				
Intersection Capacity Utilization			61.3%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												













HCM Signalized Intersection Capacity Analysis
170: 7th St & E St

Baseline 2018 PM Peak
12/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑		↵	↑↑↑					
Traffic Volume (vph)	0	0	0	0	505	205	175	1370	0	0	0	0	
Future Volume (vph)	0	0	0	0	505	205	175	1370	0	0	0	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)					4.0		4.0	4.0					
Lane Util. Factor					0.95		0.86	0.86					
Frt					0.96		1.00	1.00					
Flt Protected					1.00		0.95	1.00					
Satd. Flow (prot)					3163		1430	4468					
Flt Permitted					1.00		0.95	1.00					
Satd. Flow (perm)					3163		1430	4468					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	549	223	190	1489	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	20	0	52	6	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	752	0	119	1502	0	0	0	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%	
Turn Type					NA		Perm	NA					
Protected Phases					8			2					
Permitted Phases							2						
Actuated Green, G (s)					20.8		46.2	46.2					
Effective Green, g (s)					20.8		46.2	46.2					
Actuated g/C Ratio					0.28		0.62	0.62					
Clearance Time (s)					4.0		4.0	4.0					
Vehicle Extension (s)					0.2		0.2	0.2					
Lane Grp Cap (vph)					877		880	2752					
v/s Ratio Prot					c0.24								
v/s Ratio Perm							0.08	0.34					
v/c Ratio					0.86		0.14	0.55					
Uniform Delay, d1					25.7		6.0	8.3					
Progression Factor					1.00		0.24	0.45					
Incremental Delay, d2					8.0		0.3	0.7					
Delay (s)					33.7		1.7	4.4					
Level of Service					C		A	A					
Approach Delay (s)		0.0			33.7			4.1			0.0		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			75.0		Sum of lost time (s)				8.0				
Intersection Capacity Utilization			61.3%		ICU Level of Service				B				
Analysis Period (min)			15										
c Critical Lane Group													


















HCM Signalized Intersection Capacity Analysis
180: 6th St & F St

Baseline 2018 PM Peak
12/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑								↘	↑↑↑↑		
Traffic Volume (vph)	0	280	120	0	0	0	0	0	0	200	1910	0	
Future Volume (vph)	0	280	120	0	0	0	0	0	0	200	1910	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0								4.0	4.0		
Lane Util. Factor		0.95								1.00	0.91		
Frt		0.95								1.00	1.00		
Flt Protected		1.00								0.95	1.00		
Satd. Flow (prot)		3175								1646	4778		
Flt Permitted		1.00								0.95	1.00		
Satd. Flow (perm)		3175								1646	4778		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	301	129	0	0	0	0	0	0	215	2054	0	
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	105	0	0	
Lane Group Flow (vph)	0	426	0	0	0	0	0	0	0	110	2054	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	
Turn Type		NA								Perm	NA		
Protected Phases		4									6		
Permitted Phases										6			
Actuated Green, G (s)		28.8								38.2	38.2		
Effective Green, g (s)		28.8								38.2	38.2		
Actuated g/C Ratio		0.38								0.51	0.51		
Clearance Time (s)		4.0								4.0	4.0		
Vehicle Extension (s)		0.2								0.2	0.2		
Lane Grp Cap (vph)		1219								838	2433		
v/s Ratio Prot		c0.13									c0.43		
v/s Ratio Perm										0.07			
v/c Ratio		0.35								0.13	0.84		
Uniform Delay, d1		16.4								9.7	15.8		
Progression Factor		1.00								0.27	0.63		
Incremental Delay, d2		0.8								0.2	2.4		
Delay (s)		17.2								2.8	12.4		
Level of Service		B								A	B		
Approach Delay (s)		17.2			0.0			0.0			11.5		
Approach LOS		B			A			A			B		
Intersection Summary													
HCM 2000 Control Delay			12.4		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.63										
Actuated Cycle Length (s)			75.0		Sum of lost time (s)					8.0			
Intersection Capacity Utilization			61.3%		ICU Level of Service					B			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
190: 7th St & F St

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 						  				
Traffic Volume (vph)	105	400	0	0	0	0	0	1440	165	0	0	0
Future Volume (vph)	105	400	0	0	0	0	0	1440	165	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						0.91				
Frt		1.00						0.98				
Flt Protected		0.99						1.00				
Satd. Flow (prot)		3265						4704				
Flt Permitted		0.99						1.00				
Satd. Flow (perm)		3265						4704				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	444	0	0	0	0	0	1600	183	0	0	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	545	0	0	0	0	0	1770	0	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA						NA				
Protected Phases		4						6				
Permitted Phases	4											
Actuated Green, G (s)		16.4						50.6				
Effective Green, g (s)		16.4						50.6				
Actuated g/C Ratio		0.22						0.67				
Clearance Time (s)		4.0						4.0				
Vehicle Extension (s)		0.2						0.2				
Lane Grp Cap (vph)		713						3173				
v/s Ratio Prot								c0.38				
v/s Ratio Perm		0.17										
v/c Ratio		0.76						0.56				
Uniform Delay, d1		27.5						6.4				
Progression Factor		0.91						0.40				
Incremental Delay, d2		4.3						0.7				
Delay (s)		29.3						3.2				
Level of Service		C						A				
Approach Delay (s)		29.3			0.0			3.2			0.0	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.5					HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.0					Sum of lost time (s)			8.0	
Intersection Capacity Utilization			56.2%					ICU Level of Service			B	
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
200: 6th St & G St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗					↖	↗	↘
Traffic Volume (vph)	0	165	105	50	200	0	0	0	0	100	1820	135
Future Volume (vph)	0	165	105	50	200	0	0	0	0	100	1820	135
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		1.00			1.00					1.00	0.91	1.00
Frt		0.95			1.00					1.00	1.00	0.85
Flt Protected		1.00			0.99					0.95	1.00	1.00
Satd. Flow (prot)		1658			1733					1662	4778	1488
Flt Permitted		1.00			0.89					0.95	1.00	1.00
Satd. Flow (perm)		1658			1563					1662	4778	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	174	111	53	211	0	0	0	0	105	1916	142
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	73
Lane Group Flow (vph)	0	280	0	0	264	0	0	0	0	105	1916	69
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		8			4						6	
Permitted Phases				4						6		6
Actuated Green, G (s)		30.4			30.4					36.6	36.6	36.6
Effective Green, g (s)		30.4			30.4					36.6	36.6	36.6
Actuated g/C Ratio		0.41			0.41					0.49	0.49	0.49
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		0.2			0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		672			633					811	2331	726
v/s Ratio Prot		0.17									c0.40	
v/s Ratio Perm					c0.17					0.06		0.05
v/c Ratio		0.42			0.42					0.13	0.82	0.10
Uniform Delay, d1		16.0			16.0					10.5	16.4	10.3
Progression Factor		1.00			1.07					0.19	0.28	0.06
Incremental Delay, d2		1.9			2.0					0.2	2.2	0.2
Delay (s)		17.8			19.0					2.2	6.8	0.7
Level of Service		B			B					A	A	A
Approach Delay (s)		17.8			19.0			0.0			6.2	
Approach LOS		B			B			A			A	

Intersection Summary

HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
210: 7th St & G St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗	↖	↗	↗			
Traffic Volume (vph)	100	170	0	0	120	90	135	1380	50	0	0	0
Future Volume (vph)	100	170	0	0	120	90	135	1380	50	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.91				
Frt	1.00	1.00			1.00	0.85	1.00	0.99				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1662	1750			1750	1488	1662	4752				
Flt Permitted	0.64	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1128	1750			1750	1488	1662	4752				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	108	183	0	0	129	97	145	1484	54	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	22	0	3	0	0	0	0
Lane Group Flow (vph)	108	183	0	0	129	75	145	1535	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8					4	2					
Actuated Green, G (s)	14.8	14.8			14.8	14.8	52.2	52.2				
Effective Green, g (s)	14.8	14.8			14.8	14.8	52.2	52.2				
Actuated g/C Ratio	0.20	0.20			0.20	0.20	0.70	0.70				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	222	345			345	293	1156	3307				
v/s Ratio Prot		c0.10			0.07			c0.32				
v/s Ratio Perm	0.10					0.05	0.09					
v/c Ratio	0.49	0.53			0.37	0.25	0.13	0.46				
Uniform Delay, d1	26.7	27.0			26.1	25.4	3.8	5.1				
Progression Factor	0.88	0.92			1.00	1.00	0.24	0.28				
Incremental Delay, d2	1.6	1.5			0.7	0.5	0.2	0.4				
Delay (s)	25.1	26.3			26.8	25.9	1.1	1.9				
Level of Service	C	C			C	C	A	A				
Approach Delay (s)		25.8			26.4			1.8			0.0	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.5		HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)			8.0				
Intersection Capacity Utilization			56.8%		ICU Level of Service			B				
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
220: 6th St & J St


















Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔						↔↔↔		
Traffic Volume (vph)	0	30	50	40	40	0	0	0	0	30	1945	35	
Future Volume (vph)	0	30	50	40	40	0	0	0	0	30	1945	35	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0			4.0						4.0		
Lane Util. Factor		1.00			1.00						0.91		
Frt		0.92			1.00						1.00		
Flt Protected		1.00			0.98						1.00		
Satd. Flow (prot)		1602			1707						4762		
Flt Permitted		1.00			0.86						1.00		
Satd. Flow (perm)		1602			1501						4762		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	33	55	44	44	0	0	0	0	33	2137	38	
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	2	0	
Lane Group Flow (vph)	0	85	0	0	88	0	0	0	0	0	2206	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type		NA		Perm	NA						Perm	NA	
Protected Phases		8			4							6	
Permitted Phases				4							6		
Actuated Green, G (s)		28.0			28.0						39.0		
Effective Green, g (s)		28.0			28.0						39.0		
Actuated g/C Ratio		0.37			0.37						0.52		
Clearance Time (s)		4.0			4.0						4.0		
Vehicle Extension (s)		0.2			0.2						0.2		
Lane Grp Cap (vph)		598			560						2476		
v/s Ratio Prot		0.05											
v/s Ratio Perm					0.06							0.46	
v/c Ratio		0.14			0.16							0.89	
Uniform Delay, d1		15.6			15.6							16.1	
Progression Factor		1.00			0.82							0.56	
Incremental Delay, d2		0.5			0.6							4.0	
Delay (s)		16.0			13.4							13.0	
Level of Service		B			B							B	
Approach Delay (s)		16.0			13.4			0.0				13.0	
Approach LOS		B			B			A				B	
Intersection Summary													
HCM 2000 Control Delay			13.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.58										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			60.3%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
230: 7th St & J St

Baseline 2018 PM Peak
12/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Traffic Volume (vph)	30	20	0	0	60	25	20	1525	10	0	0	0
Future Volume (vph)	30	20	0	0	60	25	20	1525	10	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			0.91				
Frt		1.00			0.96			1.00				
Flt Protected		0.97			1.00			1.00				
Satd. Flow (prot)		1699			1681			4770				
Flt Permitted		0.78			1.00			1.00				
Satd. Flow (perm)		1356			1681			4770				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	33	22	0	0	66	27	22	1676	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	55	0	0	78	0	0	1709	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		8			4			2				
Permitted Phases	8						2					
Actuated Green, G (s)		8.8			8.8			58.2				
Effective Green, g (s)		8.8			8.8			58.2				
Actuated g/C Ratio		0.12			0.12			0.78				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		159			197			3701				
v/s Ratio Prot					c0.05							
v/s Ratio Perm		0.04						0.36				
v/c Ratio		0.35			0.40			0.46				
Uniform Delay, d1		30.5			30.6			2.9				
Progression Factor		0.84			1.00			0.42				
Incremental Delay, d2		0.4			0.5			0.3				
Delay (s)		26.0			31.1			1.6				
Level of Service		C			C			A				
Approach Delay (s)		26.0			31.1			1.6			0.0	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			3.8				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		8.0			
Intersection Capacity Utilization			49.0%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
240: 6th St & M St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	190	465	215	685	0	0	0	0	115	1970	145
Future Volume (vph)	0	190	465	215	685	0	0	0	0	115	1970	145
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						1.00	1.00
Satd. Flow (prot)		1733	1488	1662	1750						4764	1488
Flt Permitted		1.00	1.00	0.95	1.00						1.00	1.00
Satd. Flow (perm)		1733	1488	1662	1750						4764	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	200	489	226	721	0	0	0	0	121	2074	153
RTOR Reduction (vph)	0	0	73	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	200	416	226	721	0	0	0	0	0	2195	101
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA	Prot	Prot	NA					Perm	NA	Perm
Protected Phases		4	4	3	8						6	
Permitted Phases										6		6
Actuated Green, G (s)		10.8	10.8	16.0	30.8						36.2	36.2
Effective Green, g (s)		10.8	10.8	16.0	30.8						36.2	36.2
Actuated g/C Ratio		0.14	0.14	0.21	0.41						0.48	0.48
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		0.2	0.2	2.5	0.2						0.2	0.2
Lane Grp Cap (vph)		249	214	354	718						2299	718
v/s Ratio Prot		0.12	c0.28	0.14	c0.41							
v/s Ratio Perm											0.46	0.07
v/c Ratio		0.80	1.95	0.64	1.00						0.95	0.14
Uniform Delay, d1		31.1	32.1	26.9	22.1						18.6	10.8
Progression Factor		1.00	1.00	1.08	1.12						0.70	0.41
Incremental Delay, d2		16.0	441.9	2.2	28.3						7.3	0.2
Delay (s)		47.1	474.0	31.1	53.0						20.4	4.6
Level of Service		D	F	C	D						C	A
Approach Delay (s)		350.1			47.8			0.0			19.3	
Approach LOS		F			D			A			B	

Intersection Summary

HCM 2000 Control Delay	83.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
250: 7th St & M St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↑	↗		↖↖↖	↗			
Traffic Volume (vph)	2	285	0	0	430	125	465	1355	135	0	0	0
Future Volume (vph)	2	285	0	0	430	125	465	1355	135	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor		1.00			1.00	1.00		0.91	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		1732			1750	1488		4717	1488			
Flt Permitted		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		1729			1750	1488		4717	1488			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	310	0	0	467	136	505	1473	147	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	20	0	0	59	0	0	0
Lane Group Flow (vph)	0	312	0	0	467	116	0	1978	88	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA	Perm	Perm	NA	Perm			
Protected Phases		8			4			2				
Permitted Phases	8					4	2		2			
Actuated Green, G (s)		22.2			22.2	22.2		44.8	44.8			
Effective Green, g (s)		22.2			22.2	22.2		44.8	44.8			
Actuated g/C Ratio		0.30			0.30	0.30		0.60	0.60			
Clearance Time (s)		4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)		0.2			0.2	0.2		0.2	0.2			
Lane Grp Cap (vph)		511			518	440		2817	888			
v/s Ratio Prot					c0.27							
v/s Ratio Perm		0.18				0.08		0.42	0.06			
v/c Ratio		0.61			0.90	0.26		0.70	0.10			
Uniform Delay, d1		22.7			25.4	20.2		10.5	6.5			
Progression Factor		0.90			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.8			18.4	0.1		1.5	0.2			
Delay (s)		21.3			43.8	20.3		12.0	6.7			
Level of Service		C			D	C		B	A			
Approach Delay (s)		21.3			38.5			11.6			0.0	
Approach LOS		C			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			17.9				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		8.0			
Intersection Capacity Utilization			73.5%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
260: 6th St & OR 99 EB & Park St

Baseline 2018 PM Peak
12/05/2018



Movement	EBT	EBR	EBR2	WBL2	WBL	WBT	SBL2	SBL	SBT	SBR
Lane Configurations	↑	↔				↔		↔	↑↑↑	
Traffic Volume (vph)	205	40	30	10	60	35	105	370	1630	160
Future Volume (vph)	205	40	30	10	60	35	105	370	1630	160
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0				5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00				1.00		0.86	0.86	
Frt	1.00	0.85				1.00		1.00	0.99	
Flt Protected	1.00	1.00				0.97		0.95	1.00	
Satd. Flow (prot)	1733	1488				1677		1408	4450	
Flt Permitted	1.00	1.00				0.97		0.95	1.00	
Satd. Flow (perm)	1733	1488				1677		1408	4450	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	42	32	11	63	37	111	389	1716	168
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	8	0
Lane Group Flow (vph)	216	74	0	0	0	111	0	461	1915	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	3%	0%	2%	0%	0%
Turn Type	NA	Prot		Split	Split	NA	Split	Split	NA	
Protected Phases	8	8		7	7	7	5	5	5	
Permitted Phases										
Actuated Green, G (s)	14.8	14.8				11.6		56.7	56.7	
Effective Green, g (s)	14.8	14.8				11.6		56.7	56.7	
Actuated g/C Ratio	0.15	0.15				0.12		0.58	0.58	
Clearance Time (s)	5.0	5.0				5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0				2.0		3.0	3.0	
Lane Grp Cap (vph)	261	224				198		813	2572	
v/s Ratio Prot	c0.12	0.05				c0.07		0.33	c0.43	
v/s Ratio Perm										
v/c Ratio	0.83	0.33				0.56		0.57	0.74	
Uniform Delay, d1	40.4	37.2				40.8		13.0	15.3	
Progression Factor	1.00	1.00				1.00		1.00	1.00	
Incremental Delay, d2	18.1	0.3				2.2		0.9	1.2	
Delay (s)	58.5	37.5				43.0		13.9	16.5	
Level of Service	E	D				D		B	B	
Approach Delay (s)	53.2					43.0			16.0	
Approach LOS	D					D			B	
Intersection Summary										
HCM 2000 Control Delay			21.0			HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.73							
Actuated Cycle Length (s)			98.1			Sum of lost time (s)			15.0	
Intersection Capacity Utilization			67.3%			ICU Level of Service			C	
Analysis Period (min)			15							
c	Critical Lane Group									

HCM Signalized Intersection Capacity Analysis
270: 7th St & OR 99 WB & Park St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	NWL	NWR	NWR2
Lane Configurations										
Traffic Volume (vph)	215	140	80	115	60	1350	25	20	270	10
Future Volume (vph)	215	140	80	115	60	1350	25	20	270	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00		0.95		1.00	0.95	
Frt	1.00	1.00	1.00	0.85		1.00		0.87	0.85	
Flt Protected	0.95	1.00	1.00	1.00		1.00		0.99	1.00	
Satd. Flow (prot)	1662	1750	1750	1488		3309		1512	1413	
Flt Permitted	0.69	1.00	1.00	1.00		1.00		0.99	1.00	
Satd. Flow (perm)	1203	1750	1750	1488		3309		1512	1413	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	229	149	85	122	64	1436	27	21	287	11
RTOR Reduction (vph)	0	0	0	95	0	0	0	0	0	0
Lane Group Flow (vph)	229	149	85	27	0	1527	0	162	157	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	Perm	Split	NA		Prot	Prot	
Protected Phases		4	8		6	6		5	5	
Permitted Phases	4			8						
Actuated Green, G (s)	26.0	26.0	26.0	26.0		60.6		17.9	17.9	
Effective Green, g (s)	26.0	26.0	26.0	26.0		61.1		18.4	18.4	
Actuated g/C Ratio	0.22	0.22	0.22	0.22		0.52		0.16	0.16	
Clearance Time (s)	4.0	4.0	4.0	4.0		4.5		4.5	4.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		4.2		4.2	4.2	
Lane Grp Cap (vph)	266	387	387	329		1720		236	221	
v/s Ratio Prot		0.09	0.05			c0.46		0.11	c0.11	
v/s Ratio Perm	c0.19			0.02						
v/c Ratio	0.86	0.39	0.22	0.08		0.89		0.69	0.71	
Uniform Delay, d1	44.0	38.9	37.4	36.3		25.1		46.8	47.0	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	23.4	0.5	0.2	0.1		6.2		8.9	11.2	
Delay (s)	67.4	39.4	37.7	36.4		31.3		55.8	58.2	
Level of Service	E	D	D	D		C		E	E	
Approach Delay (s)		56.4	36.9			31.3		57.0		
Approach LOS		E	D			C		E		

Intersection Summary

HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
280: Parkdale Dr & OR 99

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	180	30	150	230	45	35	360	120	60	460	85
Future Volume (vph)	55	180	30	150	230	45	35	360	120	60	460	85
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1750	1488	1662	1750	1488	1662	1684		1630	1709	
Flt Permitted	0.61	1.00	1.00	0.64	1.00	1.00	0.32	1.00		0.38	1.00	
Satd. Flow (perm)	1062	1750	1488	1121	1750	1488	553	1684		647	1709	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	57	186	31	155	237	46	36	371	124	62	474	88
RTOR Reduction (vph)	0	0	21	0	0	31	0	14	0	0	8	0
Lane Group Flow (vph)	57	186	10	155	237	15	36	481	0	62	554	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		6			2			8				4
Permitted Phases	6		6	2		2	8			4		
Actuated Green, G (s)	13.0	13.0	13.0	13.0	13.0	13.0	18.5	18.5		18.5	18.5	
Effective Green, g (s)	13.5	13.5	13.5	13.5	13.5	13.5	19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.47	0.47		0.47	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	354	583	496	373	583	496	259	790		303	801	
v/s Ratio Prot		0.11			0.14			0.29				c0.32
v/s Ratio Perm	0.05		0.01	c0.14		0.01	0.07			0.10		
v/c Ratio	0.16	0.32	0.02	0.42	0.41	0.03	0.14	0.61		0.20	0.69	
Uniform Delay, d1	9.5	10.1	9.1	10.4	10.4	9.1	6.1	8.0		6.3	8.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3	0.0	0.8	0.5	0.0	0.2	1.1		0.2	2.4	
Delay (s)	9.7	10.4	9.1	11.2	10.9	9.1	6.3	9.1		6.6	10.8	
Level of Service	A	B	A	B	B	A	A	A		A	B	
Approach Delay (s)		10.1			10.8			8.9			10.4	
Approach LOS		B			B			A			B	

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	
Traffic Vol, veh/h	490	55	5	405	35	5
Future Vol, veh/h	490	55	5	405	35	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	557	63	6	460	40	6

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	620	0	1061 589
Stage 1	-	-	-	-	589 -
Stage 2	-	-	-	-	472 -
Critical Hdwy	-	-	4.1	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.2	-	3.5 3.3
Pot Cap-1 Maneuver	-	-	970	-	250 512
Stage 1	-	-	-	-	558 -
Stage 2	-	-	-	-	632 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	970	-	249 512
Mov Cap-2 Maneuver	-	-	-	-	382 -
Stage 1	-	-	-	-	555 -
Stage 2	-	-	-	-	632 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	395	-	-	970	-
HCM Lane V/C Ratio	0.115	-	-	0.006	-
HCM Control Delay (s)	15.3	-	-	8.7	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑		↑
Traffic Vol, veh/h	590	5	2	840	0	35
Future Vol, veh/h	590	5	2	840	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	275	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	0	0	1	0	0
Mvmt Flow	608	5	2	866	0	36

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	613	0	- 304
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	4.1	-	- 6.9
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	2.2	-	- 3.3
Pot Cap-1 Maneuver	-	-	976	-	0 698
Stage 1	-	-	-	-	0 -
Stage 2	-	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	976	-	- 698
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	976	-
HCM Lane V/C Ratio	0.052	-	-	0.002	-
HCM Control Delay (s)	10.4	-	-	8.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

HCM Signalized Intersection Capacity Analysis
310: Hubbard Ln & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	540	5	25	765	75	5	10	10	20	10	10
Future Volume (vph)	10	540	5	25	765	75	5	10	10	20	10	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3228	1488	1583	3292	1488	1250	1619		1568	1619	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00		0.74	1.00	
Satd. Flow (perm)	1662	3228	1488	1583	3292	1488	979	1619		1229	1619	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	562	5	26	797	78	5	10	10	21	10	10
RTOR Reduction (vph)	0	0	2	0	0	31	0	9	0	0	9	0
Lane Group Flow (vph)	10	563	3	26	797	47	5	11	0	21	11	0
Heavy Vehicles (%)	0%	3%	0%	5%	1%	0%	33%	0%	0%	6%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8				4
Permitted Phases			6			2	8			4		
Actuated Green, G (s)	0.7	27.6	27.6	0.8	27.7	27.7	5.5	5.5		5.5	5.5	
Effective Green, g (s)	0.7	29.6	29.6	0.8	29.7	29.7	6.5	6.5		6.5	6.5	
Actuated g/C Ratio	0.01	0.61	0.61	0.02	0.61	0.61	0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	23	1953	900	25	1999	903	130	215		163	215	
v/s Ratio Prot	0.01	0.17		c0.02	c0.24			0.01				0.01
v/s Ratio Perm			0.00			0.03	0.01			c0.02		
v/c Ratio	0.43	0.29	0.00	1.04	0.40	0.05	0.04	0.05		0.13	0.05	
Uniform Delay, d1	23.9	4.6	3.8	24.1	5.0	3.9	18.5	18.5		18.7	18.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.6	0.1	0.0	192.8	0.1	0.0	0.1	0.1		0.4	0.1	
Delay (s)	36.5	4.7	3.8	216.8	5.1	3.9	18.6	18.6		19.1	18.6	
Level of Service	D	A	A	F	A	A	B	B		B	B	
Approach Delay (s)		5.2			11.1			18.6			18.8	
Approach LOS		A			B			B			B	

Intersection Summary

HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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	0	570	10	275	850	80	0	0	0	0	0	20
Future Vol, veh/h	0	570	10	275	850	80	0	0	0	0	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	315	200	-	275	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	0	620	11	299	924	87	0	0	0	0	0	22

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	631	0	0	-	-	462
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.1	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.2	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	961	-	-	0	0	552
Stage 1	0	-	-	-	-	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	961	-	-	-	0	552
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.4	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	961	-	-	552
HCM Lane V/C Ratio	-	-	0.311	-	-	0.039
HCM Control Delay (s)	-	-	10.4	-	-	11.8
HCM Lane LOS	-	-	B	-	-	B
HCM 95th %tile Q(veh)	-	-	1.3	-	-	0.1

HCM Signalized Intersection Capacity Analysis
330: Dowell Rd & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	660	20	160	1070	170	45	40	130	105	55	65
Future Volume (vph)	45	660	20	160	1070	170	45	40	130	105	55	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3260	1403	1662	3260	1488	1662	1549		1646	1608	
Flt Permitted	0.23	1.00	1.00	0.30	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	407	3260	1403	522	3260	1488	1662	1549		1646	1608	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	49	725	22	176	1176	187	49	44	143	115	60	71
RTOR Reduction (vph)	0	0	14	0	0	116	0	112	0	0	50	0
Lane Group Flow (vph)	49	725	8	176	1176	71	49	75	0	115	81	0
Heavy Vehicles (%)	0%	2%	6%	0%	2%	0%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	17.2	17.2	17.2	17.2	17.2	17.2	2.6	9.7		6.4	13.5	
Effective Green, g (s)	17.2	17.2	17.2	17.2	17.2	17.2	2.6	9.7		6.4	13.5	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.38	0.06	0.21		0.14	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	154	1237	532	198	1237	564	95	331		232	479	
v/s Ratio Prot		0.22			c0.36		0.03	c0.05		c0.07	c0.05	
v/s Ratio Perm	0.12		0.01	0.34		0.05						
v/c Ratio	0.32	0.59	0.02	0.89	0.95	0.13	0.52	0.23		0.50	0.17	
Uniform Delay, d1	9.9	11.2	8.8	13.2	13.6	9.2	20.7	14.7		18.0	11.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.6	0.0	34.6	15.3	0.1	3.5	0.3		1.2	0.1	
Delay (s)	10.8	11.8	8.8	47.7	28.9	9.2	24.2	15.0		19.2	11.9	
Level of Service	B	B	A	D	C	A	C	B		B	B	
Approach Delay (s)		11.7			28.7			16.9			15.3	
Approach LOS		B			C			B			B	

Intersection Summary

HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
340: Allen Creek Rd & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑	↗	↙	↑↑	↗	↙↗	↑		↙	↗	
Traffic Volume (vph)	5	690	195	295	1005	5	405	15	170	5	105	10
Future Volume (vph)	5	690	195	295	1005	5	405	15	170	5	105	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3292	1430	1662	3292	1488	3225	1509		1662	1727	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3292	1430	1662	3292	1488	3225	1509		1662	1727	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	5	742	210	317	1081	5	435	16	183	5	113	11
RTOR Reduction (vph)	0	0	138	0	0	2	0	127	0	0	3	0
Lane Group Flow (vph)	5	742	72	317	1081	3	435	72	0	5	121	0
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2						
Actuated Green, G (s)	1.3	39.1	39.1	23.1	60.9	60.9	19.6	35.5		1.3	17.2	
Effective Green, g (s)	2.3	41.1	41.1	24.1	62.9	62.9	20.6	36.5		2.3	18.2	
Actuated g/C Ratio	0.02	0.34	0.34	0.20	0.52	0.52	0.17	0.30		0.02	0.15	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	31	1127	489	333	1725	779	553	458		31	261	
v/s Ratio Prot	0.00	0.23		c0.19	c0.33		c0.13	0.05		0.00	c0.07	
v/s Ratio Perm			0.05			0.00						
v/c Ratio	0.16	0.66	0.15	0.95	0.63	0.00	0.79	0.16		0.16	0.46	
Uniform Delay, d1	57.9	33.5	27.3	47.4	20.2	13.6	47.6	30.5		57.9	46.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	3.0	0.6	36.6	1.7	0.0	7.0	0.1		1.8	0.9	
Delay (s)	59.7	36.5	27.9	84.0	22.0	13.6	54.6	30.6		59.7	47.4	
Level of Service	E	D	C	F	C	B	D	C		E	D	
Approach Delay (s)		34.8			35.9			47.1			47.9	
Approach LOS		C			D			D			D	

Intersection Summary

HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑				↑			↑
Traffic Vol, veh/h	0	1340	130	0	2090	20	0	0	85	0	0	2
Future Vol, veh/h	0	1340	130	0	2090	20	0	0	85	0	0	2
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	-	-	275	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1381	134	0	2155	21	0	0	88	0	0	2

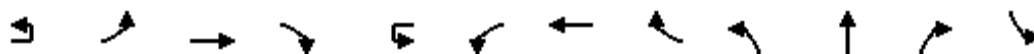
Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	-	-	0	-	-	691	-	-	1088
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	387	0	0	211
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	387	-	-	211
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		0		17		22.2	
HCM LOS					C		C	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	387	-	-	-	-	211
HCM Lane V/C Ratio	0.226	-	-	-	-	0.01
HCM Control Delay (s)	17	-	-	-	-	22.2
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.9	-	-	-	-	0

HCM Signalized Intersection Capacity Analysis
360: Ringuette St & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	75	1260	50	15	145	1895	20	190	70	225	15
Future Volume (vph)	5	75	1260	50	15	145	1895	20	190	70	225	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		0.95	0.95	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	0.98	1.00	0.95
Satd. Flow (prot)		1662	3260	1458		1662	3287		1579	1624	1473	1662
Flt Permitted		0.06	1.00	1.00		0.11	1.00		0.95	0.98	1.00	0.95
Satd. Flow (perm)		104	3260	1458		189	3287		1579	1624	1473	1662
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	77	1299	52	15	149	1954	21	196	72	232	15
RTOR Reduction (vph)	0	0	0	24	0	0	0	0	0	0	207	0
Lane Group Flow (vph)	0	82	1299	28	0	164	1975	0	131	137	25	15
Heavy Vehicles (%)	0%	0%	2%	2%	0%	0%	1%	0%	0%	0%	1%	0%
Turn Type	Prot	pm+pt	NA	Perm	Prot	pm+pt	NA		Split	NA	Perm	Split
Protected Phases	1	1	6		5	5	2		8	8		4
Permitted Phases		6		6		2					8	
Actuated Green, G (s)		73.2	66.5	66.5		83.2	71.5		13.2	13.2	13.2	14.6
Effective Green, g (s)		75.2	67.5	67.5		84.2	72.5		13.7	13.7	13.7	15.1
Actuated g/C Ratio		0.60	0.54	0.54		0.67	0.58		0.11	0.11	0.11	0.12
Clearance Time (s)		5.0	5.0	5.0		5.0	5.0		4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.5	4.5	4.5		2.5	4.5		2.5	2.5	2.5	2.8
Lane Grp Cap (vph)		158	1760	787		276	1906		173	177	161	200
v/s Ratio Prot		0.03	0.40			c0.06	c0.60		0.08	c0.08		0.01
v/s Ratio Perm		0.28		0.02		0.34					0.02	
v/c Ratio		0.52	0.74	0.04		0.59	1.04		0.76	0.77	0.16	0.07
Uniform Delay, d1		27.1	22.0	13.5		16.3	26.2		54.0	54.1	50.4	48.8
Progression Factor		1.00	1.00	1.00		1.01	0.92		1.00	1.00	1.00	1.00
Incremental Delay, d2		2.1	2.8	0.1		2.1	27.9		16.4	18.1	0.3	0.1
Delay (s)		29.3	24.8	13.6		18.5	52.0		70.4	72.2	50.8	48.9
Level of Service		C	C	B		B	D		E	E	D	D
Approach Delay (s)			24.7				49.5			61.8		
Approach LOS			C				D			E		
Intersection Summary												
HCM 2000 Control Delay			43.5				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			125.0				Sum of lost time (s)			17.0		
Intersection Capacity Utilization			95.8%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												



Movement	SBT	SBR
Lane Configurations	↶	
Traffic Volume (vph)	65	130
Future Volume (vph)	65	130
Ideal Flow (vphpl)	1750	1750
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frt	0.90	
Flt Protected	1.00	
Satd. Flow (prot)	1575	
Flt Permitted	1.00	
Satd. Flow (perm)	1575	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	67	134
RTOR Reduction (vph)	59	0
Lane Group Flow (vph)	142	0
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	14.6	
Effective Green, g (s)	15.1	
Actuated g/C Ratio	0.12	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.8	
Lane Grp Cap (vph)	190	
v/s Ratio Prot	c0.09	
v/s Ratio Perm		
v/c Ratio	0.75	
Uniform Delay, d1	53.1	
Progression Factor	1.00	
Incremental Delay, d2	14.5	
Delay (s)	67.6	
Level of Service	E	
Approach Delay (s)	66.3	
Approach LOS	E	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
380: OR 238/6th St & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	730	25	480	1020	5	100	15	295	0	960	1015
Future Volume (vph)	10	730	25	480	1020	5	100	15	295	0	960	1015
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.95		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.86			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1471	3122		3162	3226		1614	1458			3292	1473
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	1471	3122		3162	3226		1614	1458			3292	1473
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	745	26	490	1041	5	102	15	301	0	980	1036
RTOR Reduction (vph)	0	2	0	0	0	0	0	164	0	0	0	0
Lane Group Flow (vph)	10	769	0	490	1046	0	102	152	0	0	980	1036
Heavy Vehicles (%)	13%	6%	5%	2%	3%	0%	3%	0%	3%	0%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA			NA	Free
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases												Free
Actuated Green, G (s)	1.5	48.3		10.0	56.8		11.6	51.7			35.1	125.0
Effective Green, g (s)	2.5	49.3		11.0	57.8		12.6	52.7			36.1	125.0
Actuated g/C Ratio	0.02	0.39		0.09	0.46		0.10	0.42			0.29	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)	2.5	4.3		2.5	4.3		2.5	2.5			2.5	
Lane Grp Cap (vph)	29	1231		278	1491		162	614			950	1473
v/s Ratio Prot	0.01	0.25		c0.15	0.32		0.06	0.10			c0.30	
v/s Ratio Perm												c0.70
v/c Ratio	0.34	0.62		1.76	0.70		0.63	0.25			1.03	0.70
Uniform Delay, d1	60.4	30.4		57.0	26.7		54.0	23.3			44.5	0.0
Progression Factor	0.95	1.09		0.91	0.70		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.9	1.8		353.8	2.1		6.5	0.2			37.6	2.8
Delay (s)	61.5	35.0		405.7	20.9		60.4	23.5			82.1	2.8
Level of Service	E	D		F	C		E	C			F	A
Approach Delay (s)		35.4			143.6			32.5			41.3	
Approach LOS		D			F			C			D	

Intersection Summary		
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.97	
Actuated Cycle Length (s)	125.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	85.8%	ICU Level of Service E
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
390: OR 99 EB & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑↑			↑↑						↑↑			
Traffic Volume (vph)	0	855	175	0	1485	0	0	0	0	50	425	45		
Future Volume (vph)	0	855	175	0	1485	0	0	0	0	50	425	45		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750		
Total Lost time (s)		5.0			5.0						5.0			
Lane Util. Factor		0.95			0.95						0.95			
Frt		0.97			1.00						0.99			
Flt Protected		1.00			1.00						1.00			
Satd. Flow (prot)		3146			3260						3226			
Flt Permitted		1.00			1.00						1.00			
Satd. Flow (perm)		3146			3260						3226			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Adj. Flow (vph)	0	900	184	0	1563	0	0	0	0	53	447	47		
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	8	0		
Lane Group Flow (vph)	0	1076	0	0	1563	0	0	0	0	0	539	0		
Heavy Vehicles (%)	0%	3%	3%	0%	2%	0%	0%	0%	0%	0%	1%	5%		
Turn Type		NA			NA					Perm	NA			
Protected Phases		6			2						4			
Permitted Phases										4				
Actuated Green, G (s)		88.4			88.4						26.6			
Effective Green, g (s)		88.4			88.4						26.6			
Actuated g/C Ratio		0.71			0.71						0.21			
Clearance Time (s)		5.0			5.0						5.0			
Vehicle Extension (s)		4.5			4.5						2.5			
Lane Grp Cap (vph)		2224			2305						686			
v/s Ratio Prot		0.34			0.48									
v/s Ratio Perm											0.17			
v/c Ratio		0.48			0.68						0.79			
Uniform Delay, d1		8.1			10.3						46.5			
Progression Factor		0.55			1.14						1.00			
Incremental Delay, d2		0.7			1.4						5.7			
Delay (s)		5.2			13.1						52.2			
Level of Service		A			B						D			
Approach Delay (s)		5.2			13.1			0.0			52.2			
Approach LOS		A			B			A			D			
Intersection Summary														
HCM 2000 Control Delay			17.1									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.70											
Actuated Cycle Length (s)			125.0							10.0			Sum of lost time (s)	
Intersection Capacity Utilization			68.8%										ICU Level of Service	C
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis
400: OR 99 WB & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑↑				
Traffic Volume (vph)	0	905	0	0	1225	10	260	285	30	0	0	0
Future Volume (vph)	0	905	0	0	1225	10	260	285	30	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor		0.95			0.95	1.00	1.00	0.95				
Frt		1.00			1.00	0.85	1.00	0.99				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3228			3260	1488	1630	3183				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3228			3260	1488	1630	3183				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	953	0	0	1289	11	274	300	32	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	3	0	9	0	0	0	0
Lane Group Flow (vph)	0	953	0	0	1289	8	274	323	0	0	0	0
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	2%	2%	12%	0%	0%	0%
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		6			2			8				
Permitted Phases						2	8					
Actuated Green, G (s)		88.2			88.2	88.2	26.8	26.8				
Effective Green, g (s)		89.2			89.2	89.2	27.8	27.8				
Actuated g/C Ratio		0.71			0.71	0.71	0.22	0.22				
Clearance Time (s)		5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)		4.5			4.5	4.5	2.5	2.5				
Lane Grp Cap (vph)		2303			2326	1061	362	707				
v/s Ratio Prot		0.30			0.40			0.10				
v/s Ratio Perm						0.01	0.17					
v/c Ratio		0.41			0.55	0.01	0.76	0.46				
Uniform Delay, d1		7.3			8.5	5.2	45.4	42.1				
Progression Factor		2.06			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.5			1.0	0.0	8.3	0.3				
Delay (s)		15.5			9.4	5.2	53.8	42.4				
Level of Service		B			A	A	D	D				
Approach Delay (s)		15.5			9.4			47.5			0.0	
Approach LOS		B			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			19.5									B
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			125.0						8.0			
Intersection Capacity Utilization			68.8%									C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
410: Parkdale Dr/Park St & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	870	35	500	1110	80	10	85	380	70	60	10
Future Volume (vph)	20	870	35	500	1110	80	10	85	380	70	60	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00		0.98	
Satd. Flow (prot)	1662	3260	1488	1662	3292	1488		1741	1488		1691	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.79	
Satd. Flow (perm)	1662	3260	1488	1662	3292	1488		1697	1488		1375	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	21	897	36	515	1144	82	10	88	392	72	62	10
RTOR Reduction (vph)	0	0	22	0	0	28	0	0	35	0	2	0
Lane Group Flow (vph)	21	897	14	515	1144	54	0	98	357	0	142	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			4	5		8	
Permitted Phases			6			2	4		4	8		
Actuated Green, G (s)	2.6	30.4	30.4	26.5	54.3	54.3		13.7	40.2		13.7	
Effective Green, g (s)	2.6	32.4	32.4	26.5	56.3	56.3		14.7	40.2		14.7	
Actuated g/C Ratio	0.03	0.38	0.38	0.31	0.66	0.66		0.17	0.47		0.17	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		5.0	4.0		5.0	
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7		2.5	2.5		2.5	
Lane Grp Cap (vph)	50	1233	563	514	2165	978		291	698		236	
v/s Ratio Prot	0.01	c0.28		c0.31	0.35				0.16			
v/s Ratio Perm			0.01			0.04		0.06	0.08		c0.10	
v/c Ratio	0.42	0.73	0.02	1.00	0.53	0.06		0.34	0.51		0.60	
Uniform Delay, d1	40.8	22.8	16.7	29.5	7.7	5.2		31.2	15.8		32.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	4.1	2.6	0.0	40.2	0.4	0.0		0.5	0.5		3.4	
Delay (s)	44.9	25.4	16.7	69.7	8.1	5.2		31.7	16.3		36.1	
Level of Service	D	C	B	E	A	A		C	B		D	
Approach Delay (s)		25.5			26.2			19.4			36.1	
Approach LOS		C			C			B			D	

Intersection Summary		
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.80	
Actuated Cycle Length (s)	85.6	Sum of lost time (s) 12.0
Intersection Capacity Utilization	81.1%	ICU Level of Service D
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
420: US 199 & M St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	205	200	295	160	25	110	1005	240	15	1195	185
Future Volume (vph)	145	205	200	295	160	25	110	1005	240	15	1195	185
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1614	1733	1488	3225	1714		1646	3292	1473	1662	3292	1430
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1614	1733	1488	3225	1714		1646	3292	1473	1662	3292	1430
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	154	218	213	314	170	27	117	1069	255	16	1271	197
RTOR Reduction (vph)	0	0	177	0	4	0	0	0	52	0	0	31
Lane Group Flow (vph)	154	218	36	314	193	0	117	1069	203	16	1271	166
Heavy Vehicles (%)	3%	1%	0%	0%	0%	0%	1%	1%	1%	0%	1%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4		1	6	7	5	2	3
Permitted Phases			8						6			2
Actuated Green, G (s)	14.3	18.1	18.1	14.8	18.6		12.9	58.0	72.8	2.6	47.7	62.0
Effective Green, g (s)	14.3	19.1	19.1	14.8	19.6		12.9	60.0	72.8	2.6	49.7	62.0
Actuated g/C Ratio	0.13	0.17	0.17	0.13	0.17		0.11	0.53	0.65	0.02	0.44	0.55
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	6.0	4.0	4.0	6.0	4.0
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	4.7	2.5	2.5	4.7	2.5
Lane Grp Cap (vph)	205	294	252	424	298		188	1755	953	38	1454	788
v/s Ratio Prot	0.10	c0.13		c0.10	0.11		c0.07	0.32	0.03	0.01	c0.39	0.03
v/s Ratio Perm			0.02						0.11			0.09
v/c Ratio	0.75	0.74	0.14	0.74	0.65		0.62	0.61	0.21	0.42	0.87	0.21
Uniform Delay, d1	47.4	44.4	39.7	47.0	43.2		47.5	18.1	8.1	54.2	28.6	12.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.7	9.2	0.2	6.5	4.2		5.4	0.8	0.1	5.4	6.6	0.1
Delay (s)	61.1	53.5	39.9	53.5	47.5		52.9	19.0	8.2	59.6	35.1	12.9
Level of Service	E	D	D	D	D		D	B	A	E	D	B
Approach Delay (s)		50.6			51.2			19.8			32.4	
Approach LOS		D			D			B			C	

Intersection Summary

HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	112.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
430: F St/E St & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	895	195	20	1010	375	240	185	25	510	185	155
Future Volume (vph)	100	895	195	20	1010	375	240	185	25	510	185	155
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		3.0	4.0	3.0	3.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3158		1662	3260	1458	1646	1669		3131	1607	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3158		1662	3260	1458	1646	1669		3131	1607	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	106	952	207	21	1074	399	255	197	27	543	197	165
RTOR Reduction (vph)	0	16	0	0	0	131	0	4	0	0	27	0
Lane Group Flow (vph)	106	1143	0	21	1074	268	255	220	0	543	335	0
Heavy Vehicles (%)	0%	3%	0%	0%	2%	2%	1%	2%	10%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	11.6	50.0		2.0	38.4	60.8	18.4	18.6		22.4	22.6	
Effective Green, g (s)	13.6	52.0		3.0	40.4	62.8	19.4	19.6		22.4	23.6	
Actuated g/C Ratio	0.12	0.46		0.03	0.36	0.56	0.17	0.18		0.20	0.21	
Clearance Time (s)	6.0	6.0		4.0	6.0	4.0	4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	4.7		2.5	4.7	2.5	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	201	1466		44	1175	817	285	292		626	338	
v/s Ratio Prot	c0.06	c0.36		0.01	c0.33	0.07	c0.15	0.13		0.17	c0.21	
v/s Ratio Perm						0.12						
v/c Ratio	0.53	0.78		0.48	0.91	0.33	0.89	0.75		0.87	0.99	
Uniform Delay, d1	46.2	25.2		53.7	34.1	13.2	45.3	43.9		43.4	44.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	4.2		5.8	12.3	0.2	27.8	10.0		12.0	46.5	
Delay (s)	48.1	29.4		59.6	46.5	13.4	73.1	53.9		55.4	90.6	
Level of Service	D	C		E	D	B	E	D		E	F	
Approach Delay (s)		30.9			37.8			64.1			69.5	
Approach LOS		C			D			E			E	

Intersection Summary

HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
440: Beacon Dr & US 199

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	1125	160	45	1000	175	150	110	60	145	150	230
Future Volume (vph)	135	1125	160	45	1000	175	150	110	60	145	150	230
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1662	3228	1488	1498	3228	1473	1646	1645		1662	1750	1473
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1662	3228	1488	1498	3228	1473	1646	1645		1662	1750	1473
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	139	1160	165	46	1031	180	155	113	62	149	155	237
RTOR Reduction (vph)	0	0	38	0	0	40	0	17	0	0	0	104
Lane Group Flow (vph)	139	1160	127	46	1031	140	155	158	0	149	155	133
Heavy Vehicles (%)	0%	3%	0%	11%	3%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	12.7	63.9	63.9	7.6	58.8	58.8	15.9	15.4		15.1	14.6	27.3
Effective Green, g (s)	12.7	65.9	65.9	7.6	60.8	60.8	15.9	15.4		15.1	14.6	27.3
Actuated g/C Ratio	0.11	0.55	0.55	0.06	0.51	0.51	0.13	0.13		0.13	0.12	0.23
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	175	1772	817	94	1635	746	218	211		209	212	384
v/s Ratio Prot	c0.08	c0.36		0.03	0.32		c0.09	c0.10		0.09	0.09	0.04
v/s Ratio Perm			0.09			0.09						0.05
v/c Ratio	0.79	0.65	0.16	0.49	0.63	0.19	0.71	0.75		0.71	0.73	0.35
Uniform Delay, d1	52.4	19.0	13.3	54.3	21.5	16.1	49.8	50.4		50.4	50.8	38.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.9	1.9	0.4	2.9	1.9	0.6	9.8	13.3		10.2	11.5	0.4
Delay (s)	73.2	20.9	13.7	57.2	23.3	16.7	59.6	63.8		60.6	62.4	39.3
Level of Service	E	C	B	E	C	B	E	E		E	E	D
Approach Delay (s)		25.1			23.6			61.8			51.8	
Approach LOS		C			C			E			D	

Intersection Summary		
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.71	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	70.4%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
450: Terry Ln & US 199

Baseline 2018 PM Peak
12/05/2018

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↗	↖	↖	↗↗	↖	↖↖	↖		↖	↗	
Traffic Volume (vph)	5	875	350	165	820	10	315	65	160	10	40	20
Future Volume (vph)	5	875	350	165	820	10	315	65	160	10	40	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1661	3228	1452	1646	3228	1455	3225	1549		1498	1621	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1661	3228	1452	1646	3228	1455	3225	1549		1498	1621	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	911	365	172	854	10	328	68	167	10	42	21
RTOR Reduction (vph)	0	0	79	0	0	5	0	56	0	0	14	0
Lane Group Flow (vph)	5	911	286	172	854	5	328	179	0	10	49	0
Confl. Peds. (#/hr)	1		2	2		1	4		1	1		4
Heavy Vehicles (%)	0%	3%	0%	1%	3%	0%	0%	0%	0%	11%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	0.9	38.0	38.0	16.2	55.3	55.3	15.8	29.9		1.0	15.1	
Effective Green, g (s)	0.9	40.0	40.0	18.2	57.3	57.3	15.8	29.9		1.0	15.1	
Actuated g/C Ratio	0.01	0.38	0.38	0.17	0.55	0.55	0.15	0.28		0.01	0.14	
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	14	1228	552	285	1759	793	484	440		14	232	
v/s Ratio Prot	0.00	c0.28		c0.10	0.26		c0.10	c0.12		0.01	0.03	
v/s Ratio Perm			0.20			0.00						
v/c Ratio	0.36	0.74	0.52	0.60	0.49	0.01	0.68	0.41		0.71	0.21	
Uniform Delay, d1	51.8	28.1	25.1	40.1	14.8	10.9	42.2	30.4		51.9	39.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.0	2.9	1.5	3.0	0.4	0.0	3.4	0.4		95.3	0.3	
Delay (s)	62.8	30.9	26.6	43.1	15.2	10.9	45.6	30.9		147.2	40.1	
Level of Service	E	C	C	D	B	B	D	C		F	D	
Approach Delay (s)		29.8			19.8			39.5			54.8	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			28.8	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			105.1	Sum of lost time (s)					16.0			
Intersection Capacity Utilization			63.1%	ICU Level of Service				B				
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
460: Agness Ave & US 199

Baseline 2018 PM Peak
12/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	55	890	110	205	860	130	85	120	275	80	110	40	
Future Volume (vph)	55	890	110	205	860	130	85	120	275	80	110	40	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00		
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.96		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1630	3228	1449	1614	3260	1455	1661	1525		1662	1673		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.55	1.00		0.16	1.00		
Satd. Flow (perm)	1630	3228	1449	1614	3260	1455	959	1525		281	1673		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	57	927	115	214	896	135	89	125	286	83	115	42	
RTOR Reduction (vph)	0	0	74	0	0	48	0	47	0	0	9	0	
Lane Group Flow (vph)	57	927	41	214	896	87	89	364	0	83	148	0	
Confl. Peds. (#/hr)	1		3	3		1	2					2	
Heavy Vehicles (%)	2%	3%	0%	3%	2%	0%	0%	0%	4%	0%	0%	0%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA		
Protected Phases	5	2		1	6		7	4		3	8		
Permitted Phases			2			6	4			8			
Actuated Green, G (s)	8.0	41.8	41.8	21.5	55.3	55.3	42.5	32.6		41.1	31.9		
Effective Green, g (s)	8.0	43.8	43.8	21.5	57.3	57.3	42.5	32.6		41.1	31.9		
Actuated g/C Ratio	0.06	0.36	0.36	0.17	0.47	0.47	0.35	0.26		0.33	0.26		
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	2.5	4.7	4.7	2.5	4.7	4.7	2.5	2.5		2.5	2.5		
Lane Grp Cap (vph)	105	1148	515	281	1517	677	387	403		197	433		
v/s Ratio Prot	0.03	c0.29		c0.13	0.27		0.02	c0.24		c0.03	0.09		
v/s Ratio Perm			0.03			0.06	0.06			0.11			
v/c Ratio	0.54	0.81	0.08	0.76	0.59	0.13	0.23	0.90		0.42	0.34		
Uniform Delay, d1	55.8	35.8	26.3	48.4	24.3	18.7	28.0	43.7		30.9	37.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	4.5	4.8	0.1	11.1	0.9	0.2	0.2	22.9		1.1	0.3		
Delay (s)	60.2	40.6	26.4	59.4	25.1	18.9	28.2	66.6		32.0	37.4		
Level of Service	E	D	C	E	C	B	C	E		C	D		
Approach Delay (s)		40.2			30.3			59.8			35.5		
Approach LOS		D			C			E			D		
Intersection Summary													
HCM 2000 Control Delay			39.0		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.79										
Actuated Cycle Length (s)			123.1		Sum of lost time (s)						16.0		
Intersection Capacity Utilization			82.4%		ICU Level of Service						E		
Analysis Period (min)			15										

c Critical Lane Group

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑						↕	
Traffic Vol, veh/h	0	386	859	0	825	0	0	0	0	2	0	370
Future Vol, veh/h	0	386	859	0	825	0	0	0	0	2	0	370
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	5	6	0	6	0	0	0	0	0	0	7
Mvmt Flow	0	394	877	0	842	0	0	0	0	2	0	378

Major/Minor	Major1			Major2			Minor2			
Conflicting Flow All	-	0	-	-	-	0		1236	1236	-
Stage 1	-	-	-	-	-	-		842	842	-
Stage 2	-	-	-	-	-	-		394	394	-
Critical Hdwy	-	-	-	-	-	-		6.4	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-		5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-		5.4	5.5	-
Follow-up Hdwy	-	-	-	-	-	-		3.5	4	-
Pot Cap-1 Maneuver	0	-	0	0	-	0		196	178	0
Stage 1	0	-	0	0	-	0		426	383	0
Stage 2	0	-	0	0	-	0		686	609	0
Platoon blocked, %	-	-	-	-	-	-		-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-		196	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-		196	0	-
Stage 1	-	-	-	-	-	-		426	0	-
Stage 2	-	-	-	-	-	-		686	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	
HCM LOS			-

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	-	-
HCM Lane LOS	-	-	-
HCM 95th %tile Q(veh)	-	-	-

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔				
Traffic Vol, veh/h	15	70	0	0	145	65	2	645	230	0	0	0
Future Vol, veh/h	15	70	0	0	145	65	2	645	230	0	0	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	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	1	1	0	0	0
Mvmt Flow	17	79	0	0	163	73	2	725	258	0	0	0

Major/Minor	Minor2		Minor1		Major1						
Conflicting Flow All	940	987	-	-	858	854	0	0	0		
Stage 1	0	0	-	-	858	-	-	-	-		
Stage 2	940	987	-	-	0	-	-	-	-		
Critical Hdwy	7.1	6.5	-	-	6.5	6.2	4.1	-	-		
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-		
Critical Hdwy Stg 2	6.1	5.5	-	-	-	-	-	-	-		
Follow-up Hdwy	3.5	4	-	-	4	3.3	2.2	-	-		
Pot Cap-1 Maneuver	246	249	0	0	297	361	-	-	-		
Stage 1	-	-	0	0	376	-	-	-	-		
Stage 2	319	328	0	0	-	-	-	-	-		
Platoon blocked, %								-	-		
Mov Cap-1 Maneuver	111	249	-	-	297	361	-	-	-		
Mov Cap-2 Maneuver	111	249	-	-	297	-	-	-	-		
Stage 1	-	-	-	-	376	-	-	-	-		
Stage 2	144	328	-	-	-	-	-	-	-		

Approach	EB		WB		NB		
HCM Control Delay, s	37.3		23.1				
HCM LOS	E		C				

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	204	430
HCM Lane V/C Ratio	-	-	-	0.468	0.549
HCM Control Delay (s)	-	-	-	37.3	23.1
HCM Lane LOS	-	-	-	E	C
HCM 95th %tile Q(veh)	-	-	-	2.3	3.2

Intersection												
Int Delay, s/veh	19.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	2	10	110	5	25	10	335	2	85	1370	2
Future Vol, veh/h	5	2	10	110	5	25	10	335	2	85	1370	2
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	-	-	-	-	-	-	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	0	0
Mvmt Flow	5	2	11	120	5	27	11	364	2	92	1489	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1881	2062	746	1317	2062	183	1491	0	0	366	0	0
Stage 1	1674	1674	-	387	387	-	-	-	-	-	-	-
Stage 2	207	388	-	930	1675	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	45	55	360	~117	55	834	456	-	-	1204	-	-
Stage 1	101	154	-	614	613	-	-	-	-	-	-	-
Stage 2	781	612	-	291	153	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	37	50	360	~101	50	834	456	-	-	1204	-	-
Mov Cap-2 Maneuver	37	50	-	~101	50	-	-	-	-	-	-	-
Stage 1	99	142	-	599	598	-	-	-	-	-	-	-
Stage 2	731	597	-	257	141	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	59.6		263.7		0.4		0.5	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	456	-	-	84	115	1204	-
HCM Lane V/C Ratio	0.024	-	-	0.22	1.323	0.077	-
HCM Control Delay (s)	13.1	-	-	59.6	263.7	8.2	-
HCM Lane LOS	B	-	-	F	F	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	10.2	0.2	-

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

HCM Signalized Intersection Capacity Analysis
500: OR 238 & Union Ave/Harbeck Rd

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	105	55	30	75	180	45	805	20	200	1130	245
Future Volume (vph)	310	105	55	30	75	180	45	805	20	200	1130	245
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1660		1662	1750	1488	1662	3281		1662	3230	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	1660		1662	1750	1488	1662	3281		1662	3230	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	323	109	57	31	78	188	47	839	21	208	1177	255
RTOR Reduction (vph)	0	14	0	0	0	64	0	1	0	0	11	0
Lane Group Flow (vph)	323	152	0	31	78	124	47	859	0	208	1421	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	1	6		5		
Permitted Phases						4						2
Actuated Green, G (s)	26.6	30.0		5.5	8.9	25.7	6.5	35.3		16.8	45.6	
Effective Green, g (s)	26.6	30.0		5.5	8.9	25.7	6.5	36.8		16.8	47.1	
Actuated g/C Ratio	0.25	0.29		0.05	0.08	0.24	0.06	0.35		0.16	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.5	2.5		4.5	2.5	2.5	2.5	3.0		2.5	4.5	
Lane Grp Cap (vph)	420	473		86	148	420	102	1148		265	1447	
v/s Ratio Prot	c0.19	0.09		0.02	c0.04	0.05	0.03	0.26		c0.13		
v/s Ratio Perm						0.04						c0.44
v/c Ratio	0.77	0.32		0.36	0.53	0.29	0.46	0.75		0.78	0.98	
Uniform Delay, d1	36.4	29.5		48.1	46.1	32.3	47.6	30.1		42.4	28.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.9	0.3		4.4	2.6	0.3	2.4	2.7		13.6	19.5	
Delay (s)	44.3	29.8		52.5	48.7	32.6	50.0	32.8		56.1	48.0	
Level of Service	D	C		D	D	C	D	C		E	D	
Approach Delay (s)		39.4			38.9			33.7			49.1	
Approach LOS		D			D			C			D	

Intersection Summary

HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	105.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑		↕	↑↑	
Traffic Vol, veh/h	35	2	105	2	2	5	35	750	2	5	1070	40
Future Vol, veh/h	35	2	105	2	2	5	35	750	2	5	1070	40
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	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	0	0	0	3	1	0	0	0	0
Mvmt Flow	37	2	111	2	2	5	37	789	2	5	1126	42

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1627	2022	584	1438	2042	396	1168	0	0	791	0	0
Stage 1	1157	1157	-	864	864	-	-	-	-	-	-	-
Stage 2	470	865	-	574	1178	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.92	7.5	6.5	6.9	4.16	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.31	3.5	4	3.3	2.23	-	-	2.2	-	-
Pot Cap-1 Maneuver	69	59	457	95	57	609	588	-	-	838	-	-
Stage 1	212	273	-	319	374	-	-	-	-	-	-	-
Stage 2	548	374	-	476	267	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	63	55	457	66	53	609	588	-	-	838	-	-
Mov Cap-2 Maneuver	63	55	-	66	53	-	-	-	-	-	-	-
Stage 1	199	271	-	299	350	-	-	-	-	-	-	-
Stage 2	506	350	-	356	265	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	90.2		38.2		0.5		0	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	588	-	-	173	118	838	-	-
HCM Lane V/C Ratio	0.063	-	-	0.864	0.08	0.006	-	-
HCM Control Delay (s)	11.5	-	-	90.2	38.2	9.3	-	-
HCM Lane LOS	B	-	-	F	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	6.2	0.3	0	-	-

HCM Signalized Intersection Capacity Analysis
520: OR 238 & Harbeck Rd

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	50	35	145	55	40	10	60	600	30	10	980	100
Future Volume (vph)	50	35	145	55	40	10	60	600	30	10	980	100
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.92			0.99		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1584			1666		1662	3270		1662	3249	
Flt Permitted		0.92			0.66		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1473			1120		1662	3270		1662	3249	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	38	156	59	43	11	65	645	32	11	1054	108
RTOR Reduction (vph)	0	60	0	0	4	0	0	2	0	0	5	0
Lane Group Flow (vph)	0	188	0	0	109	0	65	675	0	11	1157	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		14.3			14.3		6.3	40.3		1.1	35.1	
Effective Green, g (s)		15.3			15.3		6.8	41.8		1.6	36.6	
Actuated g/C Ratio		0.22			0.22		0.10	0.59		0.02	0.52	
Clearance Time (s)		5.0			5.0		4.5	5.5		4.5	5.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.7		2.5	3.7	
Lane Grp Cap (vph)		318			242		159	1933		37	1681	
v/s Ratio Prot							c0.04	0.21		0.01	c0.36	
v/s Ratio Perm		c0.13			0.10							
v/c Ratio		0.59			0.45		0.41	0.35		0.30	0.69	
Uniform Delay, d1		24.9			24.1		30.1	7.4		34.0	12.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.4			1.0		1.2	0.1		3.3	1.3	
Delay (s)		27.3			25.0		31.3	7.6		37.3	14.0	
Level of Service		C			C		C	A		D	B	
Approach Delay (s)		27.3			25.0			9.7			14.3	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
530: OR 238 & New Hope Rd

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	235	10	5	410	670	435
Future Volume (vph)	235	10	5	410	670	435
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.99		1.00	1.00	0.94	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1661		1662	3260	3116	
Flt Permitted	0.95		0.17	1.00	1.00	
Satd. Flow (perm)	1661		303	3260	3116	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	245	10	5	427	698	453
RTOR Reduction (vph)	2	0	0	0	150	0
Lane Group Flow (vph)	253	0	5	427	1001	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	8			6	2	
Permitted Phases			6			
Actuated Green, G (s)	12.3		22.1	22.1	22.1	
Effective Green, g (s)	13.7		23.5	23.5	23.5	
Actuated g/C Ratio	0.30		0.52	0.52	0.52	
Clearance Time (s)	5.4		5.4	5.4	5.4	
Vehicle Extension (s)	2.5		4.5	4.5	4.5	
Lane Grp Cap (vph)	503		157	1694	1620	
v/s Ratio Prot	c0.15			0.13	c0.32	
v/s Ratio Perm			0.02			
v/c Ratio	0.50		0.03	0.25	0.62	
Uniform Delay, d1	12.9		5.3	6.0	7.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.6		0.1	0.1	0.9	
Delay (s)	13.5		5.4	6.1	8.6	
Level of Service	B		A	A	A	
Approach Delay (s)	13.5			6.1	8.6	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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	2	135	60	30	200	2	45	2	10	5	5	2
Future Vol, veh/h	2	135	60	30	200	2	45	2	10	5	5	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	2	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	2	167	74	37	247	2	56	2	12	6	6	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	249	0	0	241	0	0	534	531	204	537	567	248
Stage 1	-	-	-	-	-	-	208	208	-	322	322	-
Stage 2	-	-	-	-	-	-	326	323	-	215	245	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1328	-	-	1337	-	-	460	457	842	458	436	796
Stage 1	-	-	-	-	-	-	799	734	-	694	655	-
Stage 2	-	-	-	-	-	-	691	654	-	792	707	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1328	-	-	1337	-	-	442	441	842	438	421	796
Mov Cap-2 Maneuver	-	-	-	-	-	-	442	441	-	438	421	-
Stage 1	-	-	-	-	-	-	797	733	-	693	634	-
Stage 2	-	-	-	-	-	-	660	633	-	776	706	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	13.7	13
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	482	1328	-	-	1337	-	-	465
HCM Lane V/C Ratio	0.146	0.002	-	-	0.028	-	-	0.032
HCM Control Delay (s)	13.7	7.7	0	-	7.8	0	-	13
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	30	20	40	50	85	20	105	50	50	105	5
Future Vol, veh/h	2	30	20	40	50	85	20	105	50	50	105	5
Conflicting Peds, #/hr	0	0	2	2	0	0	3	0	5	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	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	32	22	43	54	91	22	113	54	54	113	5

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	484	443	121	442	418	145	121	0	0	172	0	0
Stage 1	227	227	-	189	189	-	-	-	-	-	-	-
Stage 2	257	216	-	253	229	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	496	512	936	529	529	908	1479	-	-	1417	-	-
Stage 1	780	720	-	817	748	-	-	-	-	-	-	-
Stage 2	752	728	-	756	718	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	390	479	932	466	495	904	1475	-	-	1410	-	-
Mov Cap-2 Maneuver	390	479	-	466	495	-	-	-	-	-	-	-
Stage 1	764	688	-	799	732	-	-	-	-	-	-	-
Stage 2	616	712	-	674	686	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.8		13.3		0.9		2.4	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1475	-	-	583	623	1410	-
HCM Lane V/C Ratio	0.015	-	-	0.096	0.302	0.038	-
HCM Control Delay (s)	7.5	0	-	11.8	13.3	7.7	0
HCM Lane LOS	A	A	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.3	1.3	0.1	-

Intersection						
Int Delay, s/veh	3.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	55	110	195	35	35	210
Future Vol, veh/h	55	110	195	35	35	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	63	125	222	40	40	239

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	561	242	0	0	262	0
Stage 1	242	-	-	-	-	-
Stage 2	319	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	492	802	-	-	1314	-
Stage 1	803	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	475	802	-	-	1314	-
Mov Cap-2 Maneuver	475	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	741	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	652	1314
HCM Lane V/C Ratio	-	-	0.288	0.03
HCM Control Delay (s)	-	-	12.7	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	2	2	2	2	15	2	225	5	10	250	2
Future Vol, veh/h	2	2	2	2	2	15	2	225	5	10	250	2
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	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	2	2	2	2	16	2	245	5	11	272	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	556	549	273	549	548	248	274	0	0	250	0	0
Stage 1	295	295	-	252	252	-	-	-	-	-	-	-
Stage 2	261	254	-	297	296	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	445	446	771	450	447	796	1301	-	-	1327	-	-
Stage 1	718	673	-	757	702	-	-	-	-	-	-	-
Stage 2	748	701	-	716	672	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	430	441	771	443	442	796	1301	-	-	1327	-	-
Mov Cap-2 Maneuver	430	441	-	443	442	-	-	-	-	-	-	-
Stage 1	717	666	-	755	701	-	-	-	-	-	-	-
Stage 2	729	700	-	705	665	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.2		10.5		0.1		0.3	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1301	-	-	509	681	1327	-	-
HCM Lane V/C Ratio	0.002	-	-	0.013	0.03	0.008	-	-
HCM Control Delay (s)	7.8	0	-	12.2	10.5	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	10	2	25	10	130	2	105	15	130	170	2
Future Vol, veh/h	2	10	2	25	10	130	2	105	15	130	170	2
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	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	1	0	0
Mvmt Flow	2	11	2	28	11	148	2	119	17	148	193	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	701	630	194	629	623	128	195	0	0	136	0	0
Stage 1	490	490	-	132	132	-	-	-	-	-	-	-
Stage 2	211	140	-	497	491	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.209	-	-
Pot Cap-1 Maneuver	356	401	853	398	405	927	1390	-	-	1454	-	-
Stage 1	564	552	-	876	791	-	-	-	-	-	-	-
Stage 2	796	785	-	559	552	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	266	354	853	353	358	927	1390	-	-	1454	-	-
Mov Cap-2 Maneuver	266	354	-	353	358	-	-	-	-	-	-	-
Stage 1	563	489	-	874	789	-	-	-	-	-	-	-
Stage 2	658	783	-	482	489	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.3	12.2	0.1	3.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1390	-	-	367	690	1454	-
HCM Lane V/C Ratio	0.002	-	-	0.043	0.272	0.102	-
HCM Control Delay (s)	7.6	0	-	15.3	12.2	7.8	0
HCM Lane LOS	A	A	-	C	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	1.1	0.3	-

Intersection						
Int Delay, s/veh	8.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	185	95	135	375	120	105
Future Vol, veh/h	185	95	135	375	120	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	201	103	147	408	130	114

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	304	0	955 253
Stage 1	-	-	-	-	253 -
Stage 2	-	-	-	-	702 -
Critical Hdwy	-	-	4.1	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.2	-	3.5 3.3
Pot Cap-1 Maneuver	-	-	1268	-	289 791
Stage 1	-	-	-	-	794 -
Stage 2	-	-	-	-	495 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1268	-	246 791
Mov Cap-2 Maneuver	-	-	-	-	246 -
Stage 1	-	-	-	-	675 -
Stage 2	-	-	-	-	495 -

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	33.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	363	-	-	1268	-
HCM Lane V/C Ratio	0.674	-	-	0.116	-
HCM Control Delay (s)	33.1	-	-	8.2	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	4.7	-	-	0.4	-

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	300	5	30	525	2	5	2	30	2	2	2
Future Vol, veh/h	2	300	5	30	525	2	5	2	30	2	2	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	337	6	34	590	2	6	2	34	2	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	592	0	0	343	0	0	1005	1004	340	1021	1006	591
Stage 1	-	-	-	-	-	-	344	344	-	659	659	-
Stage 2	-	-	-	-	-	-	661	660	-	362	347	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	994	-	-	1227	-	-	222	244	707	217	243	511
Stage 1	-	-	-	-	-	-	676	640	-	456	464	-
Stage 2	-	-	-	-	-	-	455	463	-	661	638	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	994	-	-	1227	-	-	212	234	707	198	233	511
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	234	-	198	233	-
Stage 1	-	-	-	-	-	-	675	639	-	455	445	-
Stage 2	-	-	-	-	-	-	432	444	-	626	637	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.4			12.9			18.9		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	496	994	-	-	1227	-	-	266
HCM Lane V/C Ratio	0.084	0.002	-	-	0.027	-	-	0.025
HCM Control Delay (s)	12.9	8.6	0	-	8	0	-	18.9
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.1

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	380	10	15	655	2	15	5	10	5	2	5
Future Vol, veh/h	2	380	10	15	655	2	15	5	10	5	2	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	432	11	17	744	2	17	6	11	6	2	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	746	0	0	443	0	0	1225	1222	438	1229	1226	745
Stage 1	-	-	-	-	-	-	442	442	-	779	779	-
Stage 2	-	-	-	-	-	-	783	780	-	450	447	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	871	-	-	1128	-	-	157	181	623	156	180	417
Stage 1	-	-	-	-	-	-	598	580	-	392	409	-
Stage 2	-	-	-	-	-	-	390	409	-	592	577	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	871	-	-	1128	-	-	150	176	623	146	175	417
Mov Cap-2 Maneuver	-	-	-	-	-	-	150	176	-	146	175	-
Stage 1	-	-	-	-	-	-	596	578	-	391	398	-
Stage 2	-	-	-	-	-	-	373	398	-	574	575	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			25.7			23.5		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	208	871	-	-	1128	-	-	208
HCM Lane V/C Ratio	0.164	0.003	-	-	0.015	-	-	0.066
HCM Control Delay (s)	25.7	9.1	0	-	8.2	0	-	23.5
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.2

HCM Signalized Intersection Capacity Analysis
620: 4th St & E St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕↕		↕	↑			↕		
Traffic Volume (vph)	0	0	0	70	385	55	15	295	0	0	325	95	
Future Volume (vph)	0	0	0	70	385	55	15	295	0	0	325	95	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)					4.0		4.0	4.0			4.0		
Lane Util. Factor					0.95		1.00	1.00			1.00		
Frt					0.98		1.00	1.00			0.97		
Flt Protected					0.99		0.95	1.00			1.00		
Satd. Flow (prot)					3242		1662	1750			1697		
Flt Permitted					0.99		0.41	1.00			1.00		
Satd. Flow (perm)					3242		721	1750			1697		
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	
Adj. Flow (vph)	0	0	0	83	458	65	18	351	0	0	387	113	
RTOR Reduction (vph)	0	0	0	0	24	0	0	0	0	0	15	0	
Lane Group Flow (vph)	0	0	0	0	582	0	18	351	0	0	485	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					4			6			2		
Permitted Phases				4			6						
Actuated Green, G (s)					13.1		28.9	28.9			28.9		
Effective Green, g (s)					13.1		28.9	28.9			28.9		
Actuated g/C Ratio					0.26		0.58	0.58			0.58		
Clearance Time (s)					4.0		4.0	4.0			4.0		
Vehicle Extension (s)					0.2		0.2	0.2			0.2		
Lane Grp Cap (vph)					849		416	1011			980		
v/s Ratio Prot								0.20			c0.29		
v/s Ratio Perm					0.18		0.02						
v/c Ratio					0.69		0.04	0.35			0.50		
Uniform Delay, d1					16.6		4.6	5.6			6.2		
Progression Factor					1.00		0.69	0.73			1.00		
Incremental Delay, d2					1.8		0.2	0.9			1.8		
Delay (s)					18.4		3.3	5.0			8.0		
Level of Service					B		A	A			A		
Approach Delay (s)		0.0			18.4			4.9			8.0		
Approach LOS		A			B			A			A		
Intersection Summary													
HCM 2000 Control Delay			11.5		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.55										
Actuated Cycle Length (s)			50.0		Sum of lost time (s)						8.0		
Intersection Capacity Utilization			54.7%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
630: 4th St & F St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕						↕		↕	↕		
Traffic Volume (vph)	85	215	50	0	0	0	0	235	70	40	370	0	
Future Volume (vph)	85	215	50	0	0	0	0	235	70	40	370	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0						4.0		4.0	4.0		
Lane Util. Factor		0.95						1.00		1.00	1.00		
Frt		0.98						0.97		1.00	1.00		
Flt Protected		0.99						1.00		0.95	1.00		
Satd. Flow (prot)		3215						1696		1662	1750		
Flt Permitted		0.99						1.00		0.51	1.00		
Satd. Flow (perm)		3215						1696		898	1750		
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	
Adj. Flow (vph)	108	272	63	0	0	0	0	297	89	51	468	0	
RTOR Reduction (vph)	0	38	0	0	0	0	0	14	0	0	0	0	
Lane Group Flow (vph)	0	405	0	0	0	0	0	372	0	51	468	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type	Perm	NA						NA		Perm	NA		
Protected Phases		8						6			2		
Permitted Phases	8									2			
Actuated Green, G (s)		10.9						31.1		31.1	31.1		
Effective Green, g (s)		10.9						31.1		31.1	31.1		
Actuated g/C Ratio		0.22						0.62		0.62	0.62		
Clearance Time (s)		4.0						4.0		4.0	4.0		
Vehicle Extension (s)		0.2						0.2		0.2	0.2		
Lane Grp Cap (vph)		700						1054		558	1088		
v/s Ratio Prot								0.22			c0.27		
v/s Ratio Perm		0.13								0.06			
v/c Ratio		0.58						0.35		0.09	0.43		
Uniform Delay, d1		17.5						4.6		3.8	4.9		
Progression Factor		1.00						1.00		1.17	0.97		
Incremental Delay, d2		0.7						0.9		0.3	1.1		
Delay (s)		18.2						5.5		4.7	5.9		
Level of Service		B						A		A	A		
Approach Delay (s)		18.2			0.0			5.5			5.8		
Approach LOS		B			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			9.8									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.47										
Actuated Cycle Length (s)			50.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			54.7%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
640: 4th St & G St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	15	135	50	25	220	70	50	175	25	45	350	30
Future Volume (vph)	15	135	50	25	220	70	50	175	25	45	350	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.97		1.00	0.98		1.00	0.99	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684			1691		1662	1717		1662	1714	
Flt Permitted		0.97			0.96		0.33	1.00		0.58	1.00	
Satd. Flow (perm)		1634			1631		586	1717		1010	1714	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	19	167	62	31	272	86	62	216	31	56	432	37
RTOR Reduction (vph)	0	20	0	0	18	0	0	8	0	0	5	0
Lane Group Flow (vph)	0	228	0	0	371	0	62	239	0	56	464	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		14.4			14.4		22.1	19.1		22.5	19.3	
Effective Green, g (s)		14.4			14.4		22.1	19.1		22.5	19.3	
Actuated g/C Ratio		0.30			0.30		0.45	0.39		0.46	0.40	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		2.5			2.5		2.5	6.1		2.5	6.1	
Lane Grp Cap (vph)		483			482		332	673		509	679	
v/s Ratio Prot							c0.01	0.14		0.01	c0.27	
v/s Ratio Perm		0.14			c0.23		0.07			0.04		
v/c Ratio		0.47			0.77		0.19	0.36		0.11	0.68	
Uniform Delay, d1		14.0			15.6		8.0	10.5		7.3	12.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5			7.2		0.2	0.9		0.1	4.4	
Delay (s)		14.6			22.8		8.2	11.4		7.4	16.5	
Level of Service		B			C		A	B		A	B	
Approach Delay (s)		14.6			22.8			10.7			15.6	
Approach LOS		B			C			B			B	

Intersection Summary

HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection

Intersection Delay, s/veh 9.5
Intersection LOS A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			Y	Y	
Traffic Vol, veh/h	135	5	5	90	130	195
Future Vol, veh/h	135	5	5	90	130	195
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	0	0	1
Mvmt Flow	148	5	5	99	143	214
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.5	8.5	9.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	5%	96%	0%
Vol Thru, %	95%	0%	40%
Vol Right, %	0%	4%	60%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	95	140	325
LT Vol	5	135	0
Through Vol	90	0	130
RT Vol	0	5	195
Lane Flow Rate	104	154	357
Geometry Grp	1	1	1
Degree of Util (X)	0.136	0.217	0.404
Departure Headway (Hd)	4.679	5.079	4.069
Convergence, Y/N	Yes	Yes	Yes
Cap	765	705	886
Service Time	2.712	3.124	2.092
HCM Lane V/C Ratio	0.136	0.218	0.403
HCM Control Delay	8.5	9.5	9.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.5	0.8	2

Intersection						
Int Delay, s/veh	65.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	480	735	90	175	60
Future Vol, veh/h	65	480	735	90	175	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	70	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	71	527	808	99	192	66

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	907	0	-	0	1527 858
Stage 1	-	-	-	-	858 -
Stage 2	-	-	-	-	669 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	759	-	-	-	~ 131 359
Stage 1	-	-	-	-	419 -
Stage 2	-	-	-	-	513 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	759	-	-	-	~ 119 359
Mov Cap-2 Maneuver	-	-	-	-	~ 119 -
Stage 1	-	-	-	-	380 -
Stage 2	-	-	-	-	513 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	\$ 442.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	759	-	-	-	143
HCM Lane V/C Ratio	0.094	-	-	-	1.806
HCM Control Delay (s)	10.2	-	-	-	\$ 442.4
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	19.4

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

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↘			↔			↔	
Traffic Vol, veh/h	5	640	15	80	790	20	15	20	65	5	5	10
Future Vol, veh/h	5	640	15	80	790	20	15	20	65	5	5	10
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	-	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	5	696	16	87	859	22	16	22	71	5	5	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	881	0	0	712	0	0	1766	1769	356	1413	1766	870
Stage 1	-	-	-	-	-	-	714	714	-	1044	1044	-
Stage 2	-	-	-	-	-	-	1052	1055	-	369	722	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	776	-	-	897	-	-	60	84	646	108	85	354
Stage 1	-	-	-	-	-	-	393	438	-	279	309	-
Stage 2	-	-	-	-	-	-	276	305	-	629	434	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	776	-	-	897	-	-	51	75	646	69	76	354
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	75	-	69	76	-
Stage 1	-	-	-	-	-	-	389	433	-	276	279	-
Stage 2	-	-	-	-	-	-	237	275	-	526	429	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.8			74			41.5		
HCM LOS							F			E		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	151	776	-	-	897	-	-	120
HCM Lane V/C Ratio	0.72	0.007	-	-	0.097	-	-	0.181
HCM Control Delay (s)	74	9.7	0.1	-	9.4	-	-	41.5
HCM Lane LOS	F	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	4.3	0	-	-	0.3	-	-	0.6

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑		↑	
Traffic Vol, veh/h	10	255	165	25	35	10
Future Vol, veh/h	10	255	165	25	35	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	287	185	28	39	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	213	0	-	0	365 199
Stage 1	-	-	-	-	199 -
Stage 2	-	-	-	-	166 -
Critical Hdwy	4.1	-	-	-	6.6 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.8 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1369	-	-	-	626 847
Stage 1	-	-	-	-	839 -
Stage 2	-	-	-	-	852 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1369	-	-	-	620 847
Mov Cap-2 Maneuver	-	-	-	-	620 -
Stage 1	-	-	-	-	831 -
Stage 2	-	-	-	-	852 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1369	-	-	-	659
HCM Lane V/C Ratio	0.008	-	-	-	0.077
HCM Control Delay (s)	7.7	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	30	25	5	35	5	30	30	10	5	25	2
Future Vol, veh/h	2	30	25	5	35	5	30	30	10	5	25	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	33	27	5	38	5	33	33	11	5	27	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	43	0	0	60	0	0	116	104	47	124	115	41
Stage 1	-	-	-	-	-	-	51	51	-	51	51	-
Stage 2	-	-	-	-	-	-	65	53	-	73	64	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1579	-	-	1556	-	-	865	790	1028	855	779	1036
Stage 1	-	-	-	-	-	-	967	856	-	967	856	-
Stage 2	-	-	-	-	-	-	951	855	-	942	846	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1579	-	-	1556	-	-	837	787	1028	817	776	1036
Mov Cap-2 Maneuver	-	-	-	-	-	-	837	787	-	817	776	-
Stage 1	-	-	-	-	-	-	966	855	-	966	853	-
Stage 2	-	-	-	-	-	-	916	852	-	895	845	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.8			9.7			9.7		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	836	1579	-	-	1556	-	-	795
HCM Lane V/C Ratio	0.092	0.001	-	-	0.004	-	-	0.044
HCM Control Delay (s)	9.7	7.3	0	-	7.3	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	35	45	5	35	10	65	25	5	2	25	5
Future Vol, veh/h	2	35	45	5	35	10	65	25	5	2	25	5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	4	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	38	49	5	38	11	71	27	5	2	27	5
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	7.4	7.5	8	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	68%	2%	10%	6%
Vol Thru, %	26%	43%	70%	78%
Vol Right, %	5%	55%	20%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	95	82	50	32
LT Vol	65	2	5	2
Through Vol	25	35	35	25
RT Vol	5	45	10	5
Lane Flow Rate	104	90	55	35
Geometry Grp	1	1	1	1
Degree of Util (X)	0.124	0.097	0.063	0.041
Departure Headway (Hd)	4.283	3.859	4.112	4.152
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	829	912	857	850
Service Time	2.352	1.952	2.208	2.24
HCM Lane V/C Ratio	0.125	0.099	0.064	0.041
HCM Control Delay	8	7.4	7.5	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.2	0.1

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	15	150	80	5	95	5	55	20	10	20	30	25
Future Vol, veh/h	15	150	80	5	95	5	55	20	10	20	30	25
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	150	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	2	0	0	0	0	0	0	0	0	0
Mvmt Flow	16	165	88	5	104	5	60	22	11	22	33	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	109	0	0	253	0	0	388	360	209	375	402	107
Stage 1	-	-	-	-	-	-	241	241	-	117	117	-
Stage 2	-	-	-	-	-	-	147	119	-	258	285	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1494	-	-	1324	-	-	574	570	836	586	540	953
Stage 1	-	-	-	-	-	-	767	710	-	892	803	-
Stage 2	-	-	-	-	-	-	860	801	-	751	679	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1494	-	-	1324	-	-	525	561	836	555	532	953
Mov Cap-2 Maneuver	-	-	-	-	-	-	525	561	-	555	532	-
Stage 1	-	-	-	-	-	-	759	702	-	882	800	-
Stage 2	-	-	-	-	-	-	798	798	-	710	672	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.4			12.7			11.5		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	558	1494	-	-	1324	-	-	632
HCM Lane V/C Ratio	0.167	0.011	-	-	0.004	-	-	0.13
HCM Control Delay (s)	12.7	7.4	-	-	7.7	-	-	11.5
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.4

HCM Signalized Intersection Capacity Analysis
720: Willow Ln & Redwood Ave

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	5	275	10	25	420	135	15	25	35	100	5	2
Future Volume (vph)	5	275	10	25	420	135	15	25	35	100	5	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.96			0.94			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	
Satd. Flow (prot)	1662	1724		1583	1682			1597			1668	
Flt Permitted	0.35	1.00		0.53	1.00			0.93			0.81	
Satd. Flow (perm)	606	1724		877	1682			1496			1407	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	5	296	11	27	452	145	16	27	38	108	5	2
RTOR Reduction (vph)	0	1	0	0	10	0	0	31	0	0	1	0
Lane Group Flow (vph)	5	306	0	27	587	0	0	50	0	0	114	0
Heavy Vehicles (%)	0%	1%	0%	5%	0%	1%	0%	5%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	28.6	28.0		30.9	28.9			9.4			9.4	
Effective Green, g (s)	29.6	29.0		31.9	30.4			9.9			9.9	
Actuated g/C Ratio	0.55	0.54		0.60	0.57			0.19			0.19	
Clearance Time (s)	4.5	5.0		4.5	5.5			4.5			4.5	
Vehicle Extension (s)	2.5	4.5		2.5	4.5			2.5			2.5	
Lane Grp Cap (vph)	357	936		556	957			277			260	
v/s Ratio Prot	0.00	0.18		c0.00	c0.35							
v/s Ratio Perm	0.01			0.03				0.03			c0.08	
v/c Ratio	0.01	0.33		0.05	0.61			0.18			0.44	
Uniform Delay, d1	5.7	6.8		4.5	7.6			18.3			19.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.4		0.0	1.5			0.2			0.9	
Delay (s)	5.7	7.1		4.5	9.1			18.6			20.2	
Level of Service	A	A		A	A			B			C	
Approach Delay (s)		7.1			8.9			18.6			20.2	
Approach LOS		A			A			B			C	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
730: Dowell Rd & Redwood Ave

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	520	65	40	605	105	130	35	80	75	40	10
Future Volume (vph)	10	520	65	40	605	105	130	35	80	75	40	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.90		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1721		1662	1697		1646	1567		1630	1700	
Flt Permitted	0.20	1.00		0.24	1.00		0.44	1.00		0.68	1.00	
Satd. Flow (perm)	351	1721		412	1697		762	1567		1168	1700	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	542	68	42	630	109	135	36	83	78	42	10
RTOR Reduction (vph)	0	3	0	0	5	0	0	70	0	0	8	0
Lane Group Flow (vph)	10	607	0	42	734	0	135	49	0	78	44	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	1%	0%	0%	2%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	38.7	38.0		44.3	40.8		22.2	11.6		12.8	6.2	
Effective Green, g (s)	38.7	39.0		44.3	41.8		22.2	12.6		12.8	7.2	
Actuated g/C Ratio	0.50	0.50		0.57	0.54		0.29	0.16		0.16	0.09	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	4.2		2.5	4.2		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	186	863		291	912		354	254		231	157	
v/s Ratio Prot	0.00	0.35		c0.01	c0.43		c0.06	0.03		0.03	0.03	
v/s Ratio Perm	0.03			0.08			c0.05			0.03		
v/c Ratio	0.05	0.70		0.14	0.81		0.38	0.19		0.34	0.28	
Uniform Delay, d1	12.0	14.9		9.7	14.6		21.7	28.2		28.5	32.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.9		0.2	5.6		0.5	0.3		0.6	0.7	
Delay (s)	12.1	17.8		9.9	20.3		22.2	28.4		29.1	33.5	
Level of Service	B	B		A	C		C	C		C	C	
Approach Delay (s)		17.7			19.7			25.1			30.9	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
740: Allen Creek Rd & Redwood Ave

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	1	550	120	20	945	2	1	1	35	1	2	2
Future Volume (vph)	1	550	120	20	945	2	1	1	35	1	2	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1703		1662	1749		1662	1494		1662	1619	
Flt Permitted	0.12	1.00		0.29	1.00		0.76	1.00		0.75	1.00	
Satd. Flow (perm)	210	1703		501	1749		1322	1494		1321	1619	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	598	130	22	1027	2	1	1	38	1	2	2
RTOR Reduction (vph)	0	4	0	0	0	0	0	35	0	0	2	0
Lane Group Flow (vph)	1	724	0	22	1029	0	1	4	0	1	2	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	48.6	47.9		48.8	48.0		5.0	4.3		5.0	4.3	
Effective Green, g (s)	50.6	48.9		50.8	49.0		7.0	5.3		7.0	5.3	
Actuated g/C Ratio	0.69	0.66		0.69	0.66		0.09	0.07		0.09	0.07	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	4.2		2.0	4.2		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	177	1129		373	1162		133	107		133	116	
v/s Ratio Prot	0.00	0.43		c0.00	c0.59		0.00	c0.00		c0.00	0.00	
v/s Ratio Perm	0.00			0.04			0.00			0.00		
v/c Ratio	0.01	0.64		0.06	0.89		0.01	0.03		0.01	0.02	
Uniform Delay, d1	9.3	7.3		4.8	10.1		30.2	31.8		30.2	31.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.5		0.0	8.6		0.0	0.0		0.0	0.0	
Delay (s)	9.3	8.7		4.8	18.7		30.2	31.9		30.2	31.8	
Level of Service	A	A		A	B		C	C		C	C	
Approach Delay (s)		8.7			18.4			31.8			31.5	
Approach LOS		A			B			C			C	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	2	2	5	2	5	2	70	10	2	40	2
Future Vol, veh/h	2	2	2	5	2	5	2	70	10	2	40	2
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	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	2	2	6	2	6	2	81	12	2	47	2

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	147	149	48	145	144	87	49	0	0	93	0	0
Stage 1	52	52	-	91	91	-	-	-	-	-	-	-
Stage 2	95	97	-	54	53	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	826	746	1027	828	751	977	1571	-	-	1514	-	-
Stage 1	966	856	-	921	823	-	-	-	-	-	-	-
Stage 2	917	819	-	963	855	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	818	745	1027	823	749	977	1571	-	-	1514	-	-
Mov Cap-2 Maneuver	818	745	-	823	749	-	-	-	-	-	-	-
Stage 1	965	855	-	920	822	-	-	-	-	-	-	-
Stage 2	908	818	-	957	854	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.3		9.2		0.2		0.3	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1571	-	-	848	866	1514	-
HCM Lane V/C Ratio	0.001	-	-	0.008	0.016	0.002	-
HCM Control Delay (s)	7.3	0	-	9.3	9.2	7.4	0
HCM Lane LOS	A	A	-	A	A	A	A
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻						↻			↻	↻
Traffic Vol, veh/h	0	240	2	0	0	0	5	0	5	2	10	280
Future Vol, veh/h	0	240	2	0	0	0	5	0	5	2	10	280
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	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	286	2	0	0	0	6	0	6	2	12	333

Major/Minor	Major1			Minor1			Major2					
Conflicting Flow All	-	0	0				303	303	287	288	0	0
Stage 1	-	-	-				287	287	-	-	-	-
Stage 2	-	-	-				16	16	-	-	-	-
Critical Hdwy	-	-	-				6.4	6.5	6.2	4.1	-	-
Critical Hdwy Stg 1	-	-	-				5.4	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-				5.4	5.5	-	-	-	-
Follow-up Hdwy	-	-	-				3.5	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	0	-	-				693	613	757	1286	-	0
Stage 1	0	-	-				766	678	-	-	-	0
Stage 2	0	-	-				1012	886	-	-	-	0
Platoon blocked, %		-	-									-
Mov Cap-1 Maneuver	-	-	-				692	0	757	1286	-	-
Mov Cap-2 Maneuver	-	-	-				692	0	-	-	-	-
Stage 1	-	-	-				764	0	-	-	-	-
Stage 2	-	-	-				1012	0	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	10.1	1.3
HCM LOS		B	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBL	SBT
Capacity (veh/h)	723	-	-	1286	-
HCM Lane V/C Ratio	0.016	-	-	0.002	-
HCM Control Delay (s)	10.1	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕			↕	
Traffic Vol, veh/h	5	2	2	15	2	100	2	70	5	105	90	5
Future Vol, veh/h	5	2	2	15	2	100	2	70	5	105	90	5
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	-	-	-	-	-	135	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	5	2	2	16	2	106	2	74	5	112	96	5

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	458	406	99	406	406	77	101	0	0	79	0	0
Stage 1	323	323	-	81	81	-	-	-	-	-	-	-
Stage 2	135	83	-	325	325	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	516	537	962	559	537	990	1504	-	-	1532	-	-
Stage 1	693	654	-	932	832	-	-	-	-	-	-	-
Stage 2	873	830	-	692	653	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	431	495	962	523	495	990	1504	-	-	1532	-	-
Mov Cap-2 Maneuver	431	495	-	523	495	-	-	-	-	-	-	-
Stage 1	692	603	-	931	831	-	-	-	-	-	-	-
Stage 2	776	829	-	634	602	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.2		9.6		0.2		4	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1504	-	-	508	520	990	1532	-	-
HCM Lane V/C Ratio	0.001	-	-	0.019	0.035	0.107	0.073	-	-
HCM Control Delay (s)	7.4	0	-	12.2	12.2	9.1	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.4	0.2	-	-

HCM Signalized Intersection Capacity Analysis
780: Allen Creek Rd & Albertsons

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	400	2	65	2	2	2	105	215	2	25	2	245
Future Volume (vph)	400	2	65	2	2	2	105	215	2	25	2	245
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	1.00			1.00	0.95
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00			1.00	0.98
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)	1579	1584	1488	1662	1619		1662	1748			1662	3248
Flt Permitted	0.76	0.73	1.00	0.61	1.00		0.56	1.00			0.61	1.00
Satd. Flow (perm)	1255	1207	1488	1071	1619		974	1748			1066	3248
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	444	2	72	2	2	2	117	239	2	28	2	272
RTOR Reduction (vph)	0	0	49	0	1	0	0	1	0	0	0	30
Lane Group Flow (vph)	222	224	23	2	3	0	117	240	0	0	30	292
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	Perm	NA
Protected Phases		8			4			6				2
Permitted Phases	8		8	4			6			2	2	
Actuated Green, G (s)	9.1	9.1	9.1	9.1	9.1		11.8	11.8			11.8	11.8
Effective Green, g (s)	9.1	9.1	9.1	9.1	9.1		11.8	11.8			11.8	11.8
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31		0.41	0.41			0.41	0.41
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	2.5
Lane Grp Cap (vph)	395	380	468	337	509		397	713			435	1326
v/s Ratio Prot					0.00			c0.14				0.09
v/s Ratio Perm	0.18	c0.19	0.02	0.00			0.12				0.03	
v/c Ratio	0.56	0.59	0.05	0.01	0.01		0.29	0.34			0.07	0.22
Uniform Delay, d1	8.2	8.3	6.9	6.8	6.8		5.8	5.9			5.2	5.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.5	1.9	0.0	0.0	0.0		0.3	0.2			0.0	0.1
Delay (s)	9.7	10.3	6.9	6.8	6.8		6.1	6.1			5.3	5.6
Level of Service	A	B	A	A	A		A	A			A	A
Approach Delay (s)		9.6			6.8			6.1				5.6
Approach LOS		A			A			A				A

Intersection Summary

HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	28.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1750
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	50
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection						
Int Delay, s/veh	6.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	85	85	125	155	65
Future Vol, veh/h	100	85	85	125	155	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	110	93	93	137	170	71

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	230	0	-	0	475 162
Stage 1	-	-	-	-	162 -
Stage 2	-	-	-	-	313 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1350	-	-	-	552 888
Stage 1	-	-	-	-	872 -
Stage 2	-	-	-	-	746 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1350	-	-	-	507 888
Mov Cap-2 Maneuver	-	-	-	-	545 -
Stage 1	-	-	-	-	801 -
Stage 2	-	-	-	-	746 -

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1350	-	-	-	615
HCM Lane V/C Ratio	0.081	-	-	-	0.393
HCM Control Delay (s)	7.9	-	-	-	14.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.9

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	10	35	380	290	35
Future Vol, veh/h	30	10	35	380	290	35
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	80	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	4	1	2	0
Mvmt Flow	35	12	41	447	341	41

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	891	191	382	0	-	0
Stage 1	362	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Critical Hdwy	6.6	6.9	4.16	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.238	-	-	-
Pot Cap-1 Maneuver	300	825	1162	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	286	825	1162	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	595	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1162	-	286	825	-	-
HCM Lane V/C Ratio	0.035	-	0.123	0.014	-	-
HCM Control Delay (s)	8.2	0	19.4	9.4	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	5	195	385	40	15	5
Future Vol, veh/h	5	195	385	40	15	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	110	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	210	414	43	16	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	457	0	-	0	656 436
Stage 1	-	-	-	-	436 -
Stage 2	-	-	-	-	220 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1104	-	-	-	430 620
Stage 1	-	-	-	-	652 -
Stage 2	-	-	-	-	817 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1104	-	-	-	428 620
Mov Cap-2 Maneuver	-	-	-	-	428 -
Stage 1	-	-	-	-	649 -
Stage 2	-	-	-	-	817 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1104	-	-	-	428	620
HCM Lane V/C Ratio	0.005	-	-	-	0.038	0.009
HCM Control Delay (s)	8.3	0	-	-	13.7	10.9
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	65	25	2	70	30	2
Future Vol, veh/h	65	25	2	70	30	2
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	79	30	2	85	37	2

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	110	0	184
Stage 1	-	-	-	-	95
Stage 2	-	-	-	-	89
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1493	-	810
Stage 1	-	-	-	-	934
Stage 2	-	-	-	-	940
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1492	-	808
Mov Cap-2 Maneuver	-	-	-	-	808
Stage 1	-	-	-	-	932
Stage 2	-	-	-	-	940

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	816	-	-	1492	-
HCM Lane V/C Ratio	0.048	-	-	0.002	-
HCM Control Delay (s)	9.6	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	35	40	30	5	40	2	35	30	5	2	35	20
Future Vol, veh/h	35	40	30	5	40	2	35	30	5	2	35	20
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	3	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	38	44	33	5	44	2	38	33	5	2	38	22
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	7.9	7.6	7.9	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	33%	11%	4%
Vol Thru, %	43%	38%	85%	61%
Vol Right, %	7%	29%	4%	35%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	105	47	57
LT Vol	35	35	5	2
Through Vol	30	40	40	35
RT Vol	5	30	2	20
Lane Flow Rate	77	115	52	63
Geometry Grp	1	1	1	1
Degree of Util (X)	0.094	0.132	0.062	0.072
Departure Headway (Hd)	4.399	4.127	4.329	4.153
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	819	854	831	867
Service Time	2.399	2.223	2.337	2.157
HCM Lane V/C Ratio	0.094	0.135	0.063	0.073
HCM Control Delay	7.9	7.9	7.6	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.2	0.2

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	10	30	40	80	65	5
Future Vol, veh/h	10	30	40	80	65	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	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	34	45	90	73	6

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	256	76	79	0	0
Stage 1	76	-	-	-	-
Stage 2	180	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	737	991	1532	-	-
Stage 1	952	-	-	-	-
Stage 2	856	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	714	991	1532	-	-
Mov Cap-2 Maneuver	714	-	-	-	-
Stage 1	922	-	-	-	-
Stage 2	856	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	2.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1532	-	903	-	-
HCM Lane V/C Ratio	0.029	-	0.05	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

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	65	240	5	2	220	40	5	2	5	60	2	60
Future Vol, veh/h	65	240	5	2	220	40	5	2	5	60	2	60
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	69	255	5	2	234	43	5	2	5	64	2	64

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	277	0	0	260	0	0	689	677	258	659	658	256
Stage 1	-	-	-	-	-	-	396	396	-	260	260	-
Stage 2	-	-	-	-	-	-	293	281	-	399	398	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1298	-	-	1316	-	-	363	377	786	380	387	788
Stage 1	-	-	-	-	-	-	633	607	-	749	697	-
Stage 2	-	-	-	-	-	-	719	682	-	631	606	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1298	-	-	1316	-	-	316	353	786	357	362	788
Mov Cap-2 Maneuver	-	-	-	-	-	-	316	353	-	357	362	-
Stage 1	-	-	-	-	-	-	594	569	-	703	696	-
Stage 2	-	-	-	-	-	-	657	681	-	586	568	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.1	13.6	15
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	431	1298	-	-	1316	-	-	489
HCM Lane V/C Ratio	0.03	0.053	-	-	0.002	-	-	0.265
HCM Control Delay (s)	13.6	7.9	0	-	7.7	0	-	15
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	1.1

Intersection												
Int Delay, s/veh	8.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	130	140	2	140	20	110	120	20	10	100	10
Future Vol, veh/h	20	130	140	2	140	20	110	120	20	10	100	10
Conflicting Peds, #/hr	12	0	4	4	0	12	5	0	0	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	20	131	141	2	141	20	111	121	20	10	101	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	276	0	0	462	423	206	479	483	168
Stage 1	-	-	-	-	-	-	246	246	-	167	167	-
Stage 2	-	-	-	-	-	-	216	177	-	312	316	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1416	-	-	1299	-	-	513	526	840	500	486	881
Stage 1	-	-	-	-	-	-	762	706	-	840	764	-
Stage 2	-	-	-	-	-	-	791	756	-	703	659	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1400	-	-	1294	-	-	413	508	837	388	469	867
Mov Cap-2 Maneuver	-	-	-	-	-	-	413	508	-	388	469	-
Stage 1	-	-	-	-	-	-	746	691	-	816	754	-
Stage 2	-	-	-	-	-	-	672	746	-	556	645	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.1			20.9			15		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	475	1400	-	-	1294	-	-	479
HCM Lane V/C Ratio	0.532	0.014	-	-	0.002	-	-	0.253
HCM Control Delay (s)	20.9	7.6	0	-	7.8	0	-	15
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	3.1	0	-	-	0	-	-	1

HCM Signalized Intersection Capacity Analysis
880: Mill St & E St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕↕		↖	↑			↗	↘	
Traffic Volume (vph)	0	0	0	55	700	15	50	55	0	0	45	40	
Future Volume (vph)	0	0	0	55	700	15	50	55	0	0	45	40	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)					4.0		4.0	4.0			4.0		
Lane Util. Factor					0.95		1.00	1.00			1.00		
Frt					1.00		1.00	1.00			0.94		
Flt Protected					1.00		0.95	1.00			1.00		
Satd. Flow (prot)					3304		1662	1750			1638		
Flt Permitted					1.00		0.74	1.00			1.00		
Satd. Flow (perm)					3304		1296	1750			1638		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	0	0	59	753	16	54	59	0	0	48	43	
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	36	0	
Lane Group Flow (vph)	0	0	0	0	826	0	54	59	0	0	55	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					6			8			4		
Permitted Phases				6			8						
Actuated Green, G (s)					19.5		4.4	4.4			4.4		
Effective Green, g (s)					20.5		5.4	5.4			5.4		
Actuated g/C Ratio					0.60		0.16	0.16			0.16		
Clearance Time (s)					5.0		5.0	5.0			5.0		
Vehicle Extension (s)					4.1		2.5	2.5			2.5		
Lane Grp Cap (vph)					1997		206	278			260		
v/s Ratio Prot								0.03			0.03		
v/s Ratio Perm					0.25		c0.04						
v/c Ratio					0.41		0.26	0.21			0.21		
Uniform Delay, d1					3.5		12.5	12.4			12.4		
Progression Factor					1.00		1.00	1.00			1.00		
Incremental Delay, d2					0.2		0.5	0.3			0.3		
Delay (s)					3.7		13.0	12.7			12.7		
Level of Service					A		B	B			B		
Approach Delay (s)		0.0			3.7			12.8			12.7		
Approach LOS		A			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			5.5		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.38										
Actuated Cycle Length (s)			33.9		Sum of lost time (s)						8.0		
Intersection Capacity Utilization			42.7%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
890: Mill St & F St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔↔						↔		↔	↔		
Traffic Volume (vph)	60	665	40	0	0	0	0	50	35	15	85	0	
Future Volume (vph)	60	665	40	0	0	0	0	50	35	15	85	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0						4.0		4.0	4.0		
Lane Util. Factor		0.95						1.00		1.00	1.00		
Frt		0.99						0.94		1.00	1.00		
Flt Protected		1.00						1.00		0.95	1.00		
Satd. Flow (prot)		3270						1624		1662	1750		
Flt Permitted		1.00						1.00		0.69	1.00		
Satd. Flow (perm)		3270						1624		1213	1750		
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	
Adj. Flow (vph)	70	773	47	0	0	0	0	58	41	17	99	0	
RTOR Reduction (vph)	0	4	0	0	0	0	0	33	0	0	0	0	
Lane Group Flow (vph)	0	886	0	0	0	0	0	66	0	17	99	0	
Heavy Vehicles (%)	0%	0%	9%	0%	0%	0%	0%	3%	0%	0%	0%	0%	
Turn Type	Perm	NA						NA		Perm	NA		
Protected Phases		2						8			4		
Permitted Phases	2									4			
Actuated Green, G (s)		19.2						6.1		6.1	6.1		
Effective Green, g (s)		20.2						7.1		7.1	7.1		
Actuated g/C Ratio		0.57						0.20		0.20	0.20		
Clearance Time (s)		5.0						5.0		5.0	5.0		
Vehicle Extension (s)		4.1						2.5		2.5	2.5		
Lane Grp Cap (vph)		1871						326		243	351		
v/s Ratio Prot								0.04			c0.06		
v/s Ratio Perm		0.27								0.01			
v/c Ratio		0.47						0.20		0.07	0.28		
Uniform Delay, d1		4.4						11.7		11.4	11.9		
Progression Factor		1.00						1.00		1.00	1.00		
Incremental Delay, d2		0.3						0.2		0.1	0.3		
Delay (s)		4.7						12.0		11.5	12.3		
Level of Service		A						B		B	B		
Approach Delay (s)		4.7			0.0			12.0			12.2		
Approach LOS		A			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			6.1									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.42										
Actuated Cycle Length (s)			35.3									Sum of lost time (s)	8.0
Intersection Capacity Utilization			42.7%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
900: Fire Mountain Wy & E St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	115	510	10	5	635	90	50	20	55	80	5	115
Future Volume (vph)	115	510	10	5	635	90	50	20	55	80	5	115
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.89		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3310		1662	3235		1583	1558		1662	1498	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.71	1.00	
Satd. Flow (perm)	1662	3310		1662	3235		1128	1558		1236	1498	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	120	531	10	5	661	94	52	21	57	83	5	120
RTOR Reduction (vph)	0	1	0	0	10	0	0	48	0	0	102	0
Lane Group Flow (vph)	120	540	0	5	745	0	52	30	0	83	23	0
Heavy Vehicles (%)	0%	0%	10%	0%	1%	0%	5%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8				4
Permitted Phases							8			4		
Actuated Green, G (s)	7.6	33.6		0.8	26.8		8.5	8.5		8.5	8.5	
Effective Green, g (s)	7.6	33.6		0.8	26.8		8.5	8.5		8.5	8.5	
Actuated g/C Ratio	0.14	0.61		0.01	0.48		0.15	0.15		0.15	0.15	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.6		2.5	4.6		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	228	2007		24	1564		173	239		189	229	
v/s Ratio Prot	c0.07	0.16		0.00	c0.23			0.02			0.02	
v/s Ratio Perm							0.05			c0.07		
v/c Ratio	0.53	0.27		0.21	0.48		0.30	0.12		0.44	0.10	
Uniform Delay, d1	22.2	5.1		27.0	9.6		20.8	20.2		21.3	20.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.1		3.1	0.4		0.7	0.2		1.2	0.1	
Delay (s)	23.9	5.3		30.1	10.0		21.5	20.4		22.5	20.3	
Level of Service	C	A		C	B		C	C		C	C	
Approach Delay (s)		8.6			10.1			20.9			21.2	
Approach LOS		A			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.48	B
Actuated Cycle Length (s)	55.4	Sum of lost time (s)
Intersection Capacity Utilization	51.0%	12.5
Analysis Period (min)	15	ICU Level of Service
		A
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
910: M St & Mill St

Baseline 2018 PM Peak
12/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	425	1	1	450	45	1	1	1	120	45	1
Future Volume (vph)	20	425	1	1	450	45	1	1	1	120	45	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	1.00			0.99			0.95		1.00	1.00	
Flt Protected	0.95	1.00			1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1554	1749			1707			1612		1614	1711	
Flt Permitted	0.49	1.00			1.00			0.92		0.76	1.00	
Satd. Flow (perm)	809	1749			1706			1506		1284	1711	
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.93	0.93	0.92	0.92	0.92	0.93	0.92	0.93
Adj. Flow (vph)	22	457	1	1	484	48	1	1	1	129	49	1
RTOR Reduction (vph)	0	0	0	0	7	0	0	1	0	0	1	0
Lane Group Flow (vph)	22	458	0	0	526	0	0	2	0	129	49	0
Heavy Vehicles (%)	7%	0%	2%	2%	0%	14%	2%	2%	2%	3%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	22.1	22.1			22.1			7.0		7.0	7.0	
Effective Green, g (s)	23.1	23.1			23.1			7.0		7.0	7.0	
Actuated g/C Ratio	0.61	0.61			0.61			0.18		0.18	0.18	
Clearance Time (s)	5.0	5.0			5.0			4.0		4.0	4.0	
Vehicle Extension (s)	4.1	4.1			4.1			2.5		2.5	2.5	
Lane Grp Cap (vph)	490	1060			1034			276		235	314	
v/s Ratio Prot		0.26									0.03	
v/s Ratio Perm	0.03				c0.31			0.00		c0.10		
v/c Ratio	0.04	0.43			0.51			0.01		0.55	0.16	
Uniform Delay, d1	3.0	4.0			4.3			12.7		14.1	13.1	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4			0.6			0.0		2.1	0.2	
Delay (s)	3.1	4.4			4.8			12.7		16.2	13.2	
Level of Service	A	A			A			B		B	B	
Approach Delay (s)		4.3			4.8			12.7			15.4	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	38.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	345	120	5	505	2	40	2	5	2	2	5
Future Vol, veh/h	5	345	120	5	505	2	40	2	5	2	2	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	67	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	5	375	130	5	549	2	43	2	5	2	2	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	551	0	0	505	0	0	1014	1011	440	1014	1075	550
Stage 1	-	-	-	-	-	-	450	450	-	560	560	-
Stage 2	-	-	-	-	-	-	564	561	-	454	515	-
Critical Hdwy	4.77	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.803	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	761	-	-	1070	-	-	219	241	621	219	221	539
Stage 1	-	-	-	-	-	-	592	575	-	516	514	-
Stage 2	-	-	-	-	-	-	514	513	-	589	538	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	761	-	-	1070	-	-	212	237	621	213	217	539
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	237	-	213	217	-
Stage 1	-	-	-	-	-	-	587	570	-	511	510	-
Stage 2	-	-	-	-	-	-	503	509	-	576	533	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.1			25.2			16.5		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	229	761	-	-	1070	-	-	323
HCM Lane V/C Ratio	0.223	0.007	-	-	0.005	-	-	0.03
HCM Control Delay (s)	25.2	9.8	0	-	8.4	0	-	16.5
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0.1

Intersection	
Intersection Delay, s/veh	24.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	55	80	125	70	85	105	105	265	80	125	215	45
Future Vol, veh/h	55	80	125	70	85	105	105	265	80	125	215	45
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0	3	0	1	2	0	3	2	3
Mvmt Flow	60	88	137	77	93	115	115	291	88	137	236	49
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	25.2	16.7	30.7	20.5
HCM LOS	D	C	D	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	21%	100%	0%	100%	0%
Vol Thru, %	0%	77%	31%	0%	45%	0%	83%
Vol Right, %	0%	23%	48%	0%	55%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	345	260	70	190	125	260
LT Vol	105	0	55	70	0	125	0
Through Vol	0	265	80	0	85	0	215
RT Vol	0	80	125	0	105	0	45
Lane Flow Rate	115	379	286	77	209	137	286
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.268	0.809	0.649	0.191	0.469	0.326	0.626
Departure Headway (Hd)	8.35	7.683	8.178	8.954	8.088	8.553	7.892
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	430	470	443	401	445	420	457
Service Time	6.093	5.426	6.224	6.703	5.837	6.301	5.64
HCM Lane V/C Ratio	0.267	0.806	0.646	0.192	0.47	0.326	0.626
HCM Control Delay	14.1	35.7	25.2	13.8	17.8	15.4	23
HCM Lane LOS	B	E	D	B	C	C	C
HCM 95th-tile Q	1.1	7.6	4.5	0.7	2.4	1.4	4.2

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	245	30	2	195	25	2
Future Vol, veh/h	245	30	2	195	25	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	0	100	0	0	0
Mvmt Flow	282	34	2	224	29	2

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	316	0	527 299
Stage 1	-	-	-	-	299 -
Stage 2	-	-	-	-	228 -
Critical Hdwy	-	-	5.1	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	3.1	-	3.5 3.3
Pot Cap-1 Maneuver	-	-	848	-	515 745
Stage 1	-	-	-	-	757 -
Stage 2	-	-	-	-	815 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	848	-	513 745
Mov Cap-2 Maneuver	-	-	-	-	513 -
Stage 1	-	-	-	-	755 -
Stage 2	-	-	-	-	815 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	525	-	-	848	-
HCM Lane V/C Ratio	0.059	-	-	0.003	-
HCM Control Delay (s)	12.3	-	-	9.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T		T	T
Traffic Vol, veh/h	25	35	340	20	50	415
Future Vol, veh/h	25	35	340	20	50	415
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	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	92
Heavy Vehicles, %	0	0	2	0	3	1
Mvmt Flow	28	39	378	22	56	451

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	952	389	0	0	400
Stage 1	389	-	-	-	-
Stage 2	563	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227
Pot Cap-1 Maneuver	290	664	-	-	1153
Stage 1	689	-	-	-	-
Stage 2	574	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	276	664	-	-	1153
Mov Cap-2 Maneuver	276	-	-	-	-
Stage 1	655	-	-	-	-
Stage 2	574	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	419	1153
HCM Lane V/C Ratio	-	-	0.159	0.048
HCM Control Delay (s)	-	-	15.2	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2

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	15	2	5	95	5	100	5	70	70	155	100	20
Future Vol, veh/h	15	2	5	95	5	100	5	70	70	155	100	20
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	35	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	16	2	5	103	5	109	5	76	76	168	109	22

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	637	618	120	584	591	114	131	0	0	152	0	0
Stage 1	456	456	-	124	124	-	-	-	-	-	-	-
Stage 2	181	162	-	460	467	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	393	408	937	426	422	944	1467	-	-	1441	-	-
Stage 1	588	572	-	885	797	-	-	-	-	-	-	-
Stage 2	825	768	-	585	565	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	312	359	937	383	371	944	1467	-	-	1441	-	-
Mov Cap-2 Maneuver	312	359	-	383	371	-	-	-	-	-	-	-
Stage 1	586	505	-	882	795	-	-	-	-	-	-	-
Stage 2	723	766	-	512	499	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.3		13.7		0.3		4.4	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1467	-	-	373	382	944	1441	-	-
HCM Lane V/C Ratio	0.004	-	-	0.064	0.285	0.115	0.117	-	-
HCM Control Delay (s)	7.5	-	-	15.3	18.1	9.3	7.8	-	-
HCM Lane LOS	A	-	-	C	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.2	0.4	0.4	-	-

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	150	235	5	55	5
Future Vol, veh/h	10	150	235	5	55	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	11	160	250	5	59	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	255	0	0	435	253
Stage 1	-	-	-	253	-
Stage 2	-	-	-	182	-
Critical Hdwy	4.1	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	3.5	3.3
Pot Cap-1 Maneuver	1322	-	-	582	791
Stage 1	-	-	-	794	-
Stage 2	-	-	-	854	-
Platoon blocked, %		-	-		
Mov Cap-1 Maneuver	1322	-	-	577	791
Mov Cap-2 Maneuver	-	-	-	577	-
Stage 1	-	-	-	787	-
Stage 2	-	-	-	854	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1322	-	-	-	590
HCM Lane V/C Ratio	0.008	-	-	-	0.108
HCM Control Delay (s)	7.7	0	-	-	11.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection						
Int Delay, s/veh	5.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	160	45	45	100	140	55
Future Vol, veh/h	160	45	45	100	140	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	170	48	48	106	149	59

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	218	0	396
Stage 1	-	-	-	-	194
Stage 2	-	-	-	-	202
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1364	-	613
Stage 1	-	-	-	-	844
Stage 2	-	-	-	-	837
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1364	-	590
Mov Cap-2 Maneuver	-	-	-	-	590
Stage 1	-	-	-	-	813
Stage 2	-	-	-	-	837

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1364	-
HCM Lane V/C Ratio	0.321	-	-	0.035	-
HCM Control Delay (s)	13.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.1	-

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	15	125	85	35	55	35
Future Vol, veh/h	15	125	85	35	55	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	17	144	98	40	63	40

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	138	0	-	0	296
Stage 1	-	-	-	-	118
Stage 2	-	-	-	-	178
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1458	-	-	-	699
Stage 1	-	-	-	-	912
Stage 2	-	-	-	-	858
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1458	-	-	-	690
Mov Cap-2 Maneuver	-	-	-	-	690
Stage 1	-	-	-	-	900
Stage 2	-	-	-	-	858

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1458	-	-	-	769
HCM Lane V/C Ratio	0.012	-	-	-	0.135
HCM Control Delay (s)	7.5	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	1	0	2
Stage 1	-	-	-	-	1
Stage 2	-	-	-	-	1
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1622	-	1021
Stage 1	-	-	-	-	1022
Stage 2	-	-	-	-	1022
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1622	-	1021
Mov Cap-2 Maneuver	-	-	-	-	1021
Stage 1	-	-	-	-	1022
Stage 2	-	-	-	-	1022

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1622	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	20	70	45	115	225	20
Future Vol, veh/h	20	70	45	115	225	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	24	85	55	140	274	24

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	536	286	298	0	0
Stage 1	286	-	-	-	-
Stage 2	250	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	509	758	1275	-	-
Stage 1	767	-	-	-	-
Stage 2	796	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	485	758	1275	-	-
Mov Cap-2 Maneuver	485	-	-	-	-
Stage 1	731	-	-	-	-
Stage 2	796	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1275	-	674	-	-
HCM Lane V/C Ratio	0.043	-	0.163	-	-
HCM Control Delay (s)	8	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	15	5	150	5	5	190
Future Vol, veh/h	15	5	150	5	5	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	17	6	169	6	6	213

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	397	172	0	0	175
Stage 1	172	-	-	-	-
Stage 2	225	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	612	877	-	-	1414
Stage 1	863	-	-	-	-
Stage 2	817	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	609	877	-	-	1414
Mov Cap-2 Maneuver	609	-	-	-	-
Stage 1	859	-	-	-	-
Stage 2	817	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	659	1414
HCM Lane V/C Ratio	-	-	0.034	0.004
HCM Control Delay (s)	-	-	10.7	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0