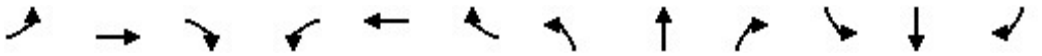
Appendix B

Highway Capacity Manual
Signalized Intersection Analysis

MD 99 Investigation



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	257	178	72	275	24	210	212	103	249	736	88
Future Volume (vph)	58	257	178	72	275	24	210	212	103	249	736	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0	7.0		5.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1840		1770	3365		1770	3482	
Flt Permitted	0.35	1.00	1.00	0.44	1.00		0.15	1.00		0.53	1.00	
Satd. Flow (perm)	658	1863	1583	815	1840		287	3365		986	3482	
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)	63	279	193	78	299	26	228	230	112	271	800	96
RTOR Reduction (vph)	0	0	94	0	1	0	0	39	0	0	6	0
Lane Group Flow (vph)	63	279	99	78	324	0	228	303	0	271	890	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)	40.4	31.5	31.5	39.6	31.1		46.9	36.8		46.9	36.8	
Effective Green, g (s)	40.4	31.5	31.5	39.6	31.1		46.9	36.8		46.9	36.8	
Actuated g/C Ratio	0.37	0.29	0.29	0.36	0.28		0.43	0.33		0.43	0.33	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	331	533	453	367	520		258	1126		492	1165	
v/s Ratio Prot	0.02	0.15		c0.02	c0.18		c0.08	0.09		0.05	0.26	
v/s Ratio Perm	0.05		0.06	0.06			c0.29			0.18		
v/c Ratio	0.19	0.52	0.22	0.21	0.62		0.88	0.27		0.55	0.76	
Uniform Delay, d1	23.5	32.9	29.8	23.8	34.3		23.4	26.7		21.5	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	0.3	0.9	0.2	0.3	2.3		27.9	0.3		1.3	3.6	
Delay (s)	23.7	33.8	30.1	24.1	36.6		51.3	27.0		22.8	36.2	
Level of Service	C	C	C	C	D		D	C		C	D	
Approach Delay (s)		31.3			34.2			36.7			33.1	
Approach LOS		C			C			D			C	

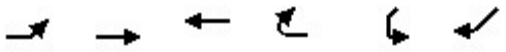
Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	109.9	Sum of lost time (s)	23.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	598	11	7	333	38	0
Future Volume (Veh/h)	598	11	7	333	38	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	650	12	8	362	41	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				842		
pX, platoon unblocked						
vC, conflicting volume			662		1028	650
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			662		1028	650
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		84	100
cM capacity (veh/h)			927		257	469

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	650	12	8	362	41
Volume Left	0	0	8	0	41
Volume Right	0	12	0	0	0
cSH	1700	1700	927	1700	257
Volume to Capacity	0.38	0.01	0.01	0.21	0.16
Queue Length 95th (ft)	0	0	1	0	14
Control Delay (s)	0.0	0.0	8.9	0.0	21.6
Lane LOS			A		C
Approach Delay (s)	0.0		0.2		21.6
Approach LOS					C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		



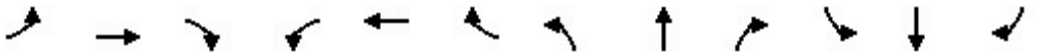
Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	220	378	168	146	309	172
Future Volume (vph)	220	378	168	146	309	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.94		0.95	
Flt Protected		0.98	1.00		0.97	
Satd. Flow (prot)		1829	1746		1718	
Flt Permitted		0.68	1.00		0.97	
Satd. Flow (perm)		1262	1746		1718	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	411	183	159	336	187
RTOR Reduction (vph)	0	0	18	0	15	0
Lane Group Flow (vph)	0	650	324	0	508	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		6	2		4	
Permitted Phases	6					
Actuated Green, G (s)		75.5	75.5		43.4	
Effective Green, g (s)		75.5	75.5		43.4	
Actuated g/C Ratio		0.57	0.57		0.33	
Clearance Time (s)		7.0	7.0		6.0	
Vehicle Extension (s)		6.0	6.0		3.0	
Lane Grp Cap (vph)		722	999		565	
v/s Ratio Prot			0.19		c0.30	
v/s Ratio Perm		c0.52				
v/c Ratio		0.90	0.32		0.90	
Uniform Delay, d1		24.9	14.8		42.1	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		15.7	0.5		16.9	
Delay (s)		40.6	15.3		59.1	
Level of Service		D	B		E	
Approach Delay (s)		40.6	15.3		59.1	
Approach LOS		D	B		E	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	131.9	Sum of lost time (s)	13.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	892	7	4	229	0	16	0	18	0	0	0
Future Volume (vph)	0	892	7	4	229	0	16	0	18	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		15%			0%			0%			0%	
Total Lost time (s)		6.0		5.0	6.0			6.0				
Lane Util. Factor		1.00		1.00	1.00			1.00				
Frt		1.00		1.00	1.00			0.93				
Flt Protected		1.00		0.95	1.00			0.98				
Satd. Flow (prot)		1721		1770	1863			1688				
Flt Permitted		1.00		0.21	1.00			0.85				
Satd. Flow (perm)		1721		400	1863			1472				
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	970	8	4	249	0	17	0	20	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	35	0	0	0	0
Lane Group Flow (vph)	0	978	0	4	249	0	0	2	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA				
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)		89.4		95.7	95.7			6.5				
Effective Green, g (s)		89.4		95.7	95.7			6.5				
Actuated g/C Ratio		0.78		0.84	0.84			0.06				
Clearance Time (s)		6.0		5.0	6.0			6.0				
Vehicle Extension (s)		5.0		3.0	5.0			3.0				
Lane Grp Cap (vph)		1347		350	1561			83				
v/s Ratio Prot		c0.57		0.00	c0.13							
v/s Ratio Perm				0.01				c0.00				
v/c Ratio		0.73		0.01	0.16			0.03				
Uniform Delay, d1		6.2		5.1	1.7			50.9				
Progression Factor		1.00		1.00	1.00			1.00				
Incremental Delay, d2		2.4		0.0	0.1			0.1				
Delay (s)		8.7		5.1	1.8			51.0				
Level of Service		A		A	A			D				
Approach Delay (s)		8.7			1.9			51.0			0.0	
Approach LOS		A			A			D			A	

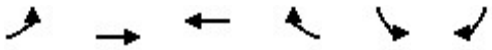
Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	114.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	843	279	51	302	13	70	14	56	42	31	23
Future Volume (vph)	11	843	279	51	302	13	70	14	56	42	31	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	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	0.99		1.00	0.88		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1851		1770	1638		1770	1744	
Flt Permitted	0.56	1.00	1.00	0.20	1.00		0.72	1.00		0.71	1.00	
Satd. Flow (perm)	1034	1863	1583	367	1851		1338	1638		1318	1744	
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)	12	916	303	55	328	14	76	15	61	46	34	25
RTOR Reduction (vph)	0	0	70	0	1	0	0	51	0	0	21	0
Lane Group Flow (vph)	12	916	233	55	341	0	76	25	0	46	38	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2			8			4		
Actuated Green, G (s)	44.5	44.5	44.5	44.5	44.5		10.8	10.8		10.8	10.8	
Effective Green, g (s)	44.5	44.5	44.5	44.5	44.5		10.8	10.8		10.8	10.8	
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66		0.16	0.16		0.16	0.16	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	6.0	6.0	6.0	6.0	6.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	683	1231	1046	242	1223		214	262		211	279	
v/s Ratio Prot		c0.49			0.18			0.02			0.02	
v/s Ratio Perm	0.01		0.15	0.15			c0.06			0.03		
v/c Ratio	0.02	0.74	0.22	0.23	0.28		0.36	0.09		0.22	0.14	
Uniform Delay, d1	3.9	7.6	4.5	4.5	4.7		25.1	24.1		24.6	24.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	3.3	0.3	1.4	0.4		1.0	0.2		0.5	0.2	
Delay (s)	3.9	10.9	4.8	5.9	5.1		26.2	24.2		25.1	24.5	
Level of Service	A	B	A	A	A		C	C		C	C	
Approach Delay (s)		9.4			5.2			25.2			24.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

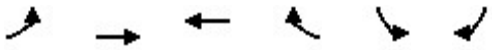
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	939	359	8	20	7
Future Volume (Veh/h)	2	939	359	8	20	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	1021	390	9	22	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		870				
pX, platoon unblocked					0.56	
vC, conflicting volume	399				1415	390
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	399				1348	390
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				76	99
cM capacity (veh/h)	1160				93	658

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	2	1021	390	9	30
Volume Left	2	0	0	0	22
Volume Right	0	0	0	9	8
cSH	1160	1700	1700	1700	121
Volume to Capacity	0.00	0.60	0.23	0.01	0.25
Queue Length 95th (ft)	0	0	0	0	23
Control Delay (s)	8.1	0.0	0.0	0.0	44.5
Lane LOS	A				E
Approach Delay (s)	0.0		0.0		44.5
Approach LOS					E

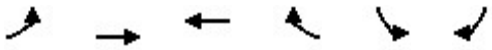
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	954	357	10	32	10
Future Volume (Veh/h)	5	954	357	10	32	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1037	388	11	35	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	399				1435	388
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	399				1435	388
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				76	98
cM capacity (veh/h)	1160				147	660

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	5	1037	388	11	46
Volume Left	5	0	0	0	35
Volume Right	0	0	0	11	11
cSH	1160	1700	1700	1700	180
Volume to Capacity	0.00	0.61	0.23	0.01	0.26
Queue Length 95th (ft)	0	0	0	0	24
Control Delay (s)	8.1	0.0	0.0	0.0	31.7
Lane LOS	A				D
Approach Delay (s)	0.0		0.0		31.7
Approach LOS					D

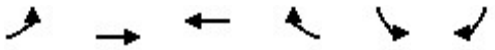
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	978	345	11	47	22
Future Volume (Veh/h)	8	978	345	11	47	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	1063	375	12	51	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			1224			
pX, platoon unblocked						
vC, conflicting volume	387				1456	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	387				1456	375
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				64	96
cM capacity (veh/h)	1171				142	671

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	1072	375	12	75
Volume Left	9	0	0	51
Volume Right	0	0	12	24
cSH	1171	1700	1700	190
Volume to Capacity	0.01	0.22	0.01	0.40
Queue Length 95th (ft)	1	0	0	44
Control Delay (s)	0.2	0.0	0.0	35.8
Lane LOS	A			E
Approach Delay (s)	0.2	0.0		35.8
Approach LOS				E

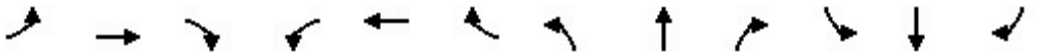
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	947	253	155	17	103
Future Volume (Veh/h)	78	947	253	155	17	103
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	85	1029	275	168	18	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						6
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			590			
pX, platoon unblocked	0.94				0.94	0.94
vC, conflicting volume	443				1474	275
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	373				1472	194
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				85	86
cM capacity (veh/h)	1112				121	795

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	85	1029	275	168	130
Volume Left	85	0	0	0	18
Volume Right	0	0	0	168	112
cSH	1112	1700	1700	1700	874
Volume to Capacity	0.08	0.61	0.16	0.10	0.15
Queue Length 95th (ft)	6	0	0	0	13
Control Delay (s)	8.5	0.0	0.0	0.0	14.4
Lane LOS	A				B
Approach Delay (s)	0.6		0.0		14.4
Approach LOS					B

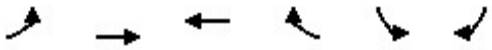
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	830	110	65	315	130	80	35	120	115	35	15
Future Volume (vph)	30	830	110	65	315	130	80	35	120	115	35	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.96	1.00
Satd. Flow (prot)	969	1769		1770	1863	897		1461	1583		1220	1077
Flt Permitted	0.48	1.00		0.04	1.00	1.00		0.97	1.00		0.96	1.00
Satd. Flow (perm)	488	1769		77	1863	897		1461	1583		1220	1077
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	35	976	129	76	371	153	94	41	141	135	41	18
RTOR Reduction (vph)	0	1	0	0	0	70	0	0	124	0	0	15
Lane Group Flow (vph)	35	1104	0	76	371	83	0	135	17	0	176	3
Heavy Vehicles (%)	80%	2%	2%	2%	2%	80%	2%	80%	2%	50%	50%	50%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	6			2		2			4			3
Actuated Green, G (s)	99.1	92.2		108.7	97.0	97.0		22.0	22.0		31.5	31.5
Effective Green, g (s)	99.1	92.2		108.7	97.0	97.0		22.0	22.0		31.5	31.5
Actuated g/C Ratio	0.55	0.51		0.61	0.54	0.54		0.12	0.12		0.18	0.18
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0		5.5	5.5		5.5	5.5
Vehicle Extension (s)	2.5	6.0		2.5	6.0	6.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	288	909		157	1007	485		179	194		214	189
v/s Ratio Prot	0.00	c0.62		c0.03	0.20			c0.09			c0.14	
v/s Ratio Perm	0.06			0.26		0.09			0.01			0.00
v/c Ratio	0.12	1.21		0.48	0.37	0.17		0.75	0.09		0.82	0.02
Uniform Delay, d1	19.0	43.6		39.7	23.6	20.8		76.1	69.8		71.3	61.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	106.5		1.7	0.6	0.5		16.4	0.2		21.8	0.0
Delay (s)	19.1	150.1		41.4	24.3	21.3		92.5	70.0		93.0	61.2
Level of Service	B	F		D	C	C		F	E		F	E
Approach Delay (s)		146.0			25.7			81.0			90.1	
Approach LOS		F			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	100.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	179.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

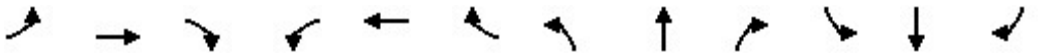
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	1052	477	15	89	22
Future Volume (Veh/h)	8	1052	477	15	89	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	1143	518	16	97	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	534				1679	518
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	534				1679	518
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				6	96
cM capacity (veh/h)	1034				103	558

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	9	1143	518	16	121
Volume Left	9	0	0	0	97
Volume Right	0	0	0	16	24
cSH	1034	1700	1700	1700	123
Volume to Capacity	0.01	0.67	0.30	0.01	0.98
Queue Length 95th (ft)	1	0	0	0	165
Control Delay (s)	8.5	0.0	0.0	0.0	143.6
Lane LOS	A				F
Approach Delay (s)	0.1		0.0		143.6
Approach LOS					F

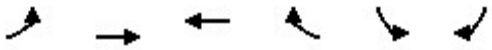
Intersection Summary			
Average Delay	9.7		
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1138	2	5	484	2	6	0	15	5	0	2
Future Volume (Veh/h)	1	1138	2	5	484	2	6	0	15	5	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1237	2	5	526	2	7	0	16	5	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	528			1239			1778	1778	1238	1783	1777	526
vC1, stage 1 conf vol							1240	1240		536	536	
vC2, stage 2 conf vol							538	538		1247	1241	
vCu, unblocked vol	528			1239			1778	1778	1238	1783	1777	526
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	100	93	97	100	100
cM capacity (veh/h)	1039			562			198	226	214	179	222	552

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	1239	5	526	2	23	7
Volume Left	1	0	5	0	0	7	5
Volume Right	0	2	0	0	2	16	2
cSH	1039	1700	562	1700	1700	308	222
Volume to Capacity	0.00	0.73	0.01	0.31	0.00	0.07	0.03
Queue Length 95th (ft)	0	0	1	0	0	6	2
Control Delay (s)	8.5	0.0	11.5	0.0	0.0	23.4	21.7
Lane LOS	A		B			C	C
Approach Delay (s)	0.0		0.1			23.4	21.7
Approach LOS						C	C

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	76.7%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	1149	455	15	123	36
Future Volume (Veh/h)	9	1149	455	15	123	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1249	495	16	134	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			1305			
pX, platoon unblocked						
vC, conflicting volume	511				1764	495
vC1, stage 1 conf vol					495	
vC2, stage 2 conf vol					1269	
vCu, unblocked vol	511				1764	495
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				45	93
cM capacity (veh/h)	1054				243	575

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	10	1249	495	16	173
Volume Left	10	0	0	0	134
Volume Right	0	0	0	16	39
cSH	1054	1700	1700	1700	314
Volume to Capacity	0.01	0.73	0.29	0.01	0.55
Queue Length 95th (ft)	1	0	0	0	78
Control Delay (s)	8.4	0.0	0.0	0.0	31.0
Lane LOS	A				D
Approach Delay (s)	0.1		0.0		31.0
Approach LOS					D

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1272	0	8	470	0	43
Future Volume (Veh/h)	1272	0	8	470	0	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1383	0	9	511	0	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				487		
pX, platoon unblocked						
vC, conflicting volume			1383		1656	1383
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1383		1656	1383
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	65
cM capacity (veh/h)			491		87	133

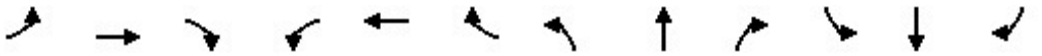
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1383	179	341	47
Volume Left	0	9	0	0
Volume Right	0	0	0	47
cSH	1700	491	1700	133
Volume to Capacity	0.81	0.02	0.20	0.35
Queue Length 95th (ft)	0	1	0	36
Control Delay (s)	0.0	0.9	0.0	46.0
Lane LOS		A		E
Approach Delay (s)	0.0	0.3		46.0
Approach LOS				E

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	233	1082	794	214	264	535
Future Volume (vph)	233	1082	794	214	264	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	4.0	5.0	7.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	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	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	253	1176	863	233	287	582
RTOR Reduction (vph)	0	0	0	0	0	477
Lane Group Flow (vph)	253	1176	863	233	287	105
Turn Type	NA	Free	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		Free				4
Actuated Green, G (s)	20.9	88.5	33.6	59.5	16.0	16.0
Effective Green, g (s)	20.9	88.5	33.6	59.5	16.0	16.0
Actuated g/C Ratio	0.24	1.00	0.38	0.67	0.18	0.18
Clearance Time (s)	7.0		5.0	7.0	6.0	6.0
Vehicle Extension (s)	6.0		3.0	6.0	3.5	3.5
Lane Grp Cap (vph)	439	1583	1303	1252	620	286
v/s Ratio Prot	0.14		0.25	0.13	0.08	
v/s Ratio Perm		c0.74				0.07
v/c Ratio	0.58	0.74	0.66	0.19	0.46	0.37
Uniform Delay, d1	29.9	0.0	22.7	5.4	32.4	31.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	3.2	1.3	0.2	0.6	0.9
Delay (s)	33.5	3.2	24.0	5.6	33.1	32.8
Level of Service	C	A	C	A	C	C
Approach Delay (s)	8.6			20.1	32.9	
Approach LOS	A			C	C	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

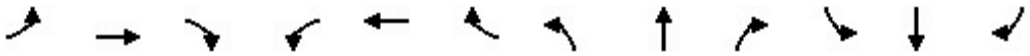
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	565	101	0	761	38	32	5	3	30	6	147
Future Volume (vph)	107	565	101	0	761	38	32	5	3	30	6	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	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	0.85		0.99			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00		0.96			0.96	1.00
Satd. Flow (prot)	1770	1863	1583		1863	1583		1773			1789	1583
Flt Permitted	0.19	1.00	1.00		1.00	1.00		0.74			0.73	1.00
Satd. Flow (perm)	348	1863	1583		1863	1583		1362			1367	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	116	614	110	0	827	41	35	5	3	33	7	160
RTOR Reduction (vph)	0	0	26	0	0	16	0	3	0	0	0	144
Lane Group Flow (vph)	116	614	84	0	827	25	0	40	0	0	40	16
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2		2	4			8		8
Actuated Green, G (s)	56.6	56.6	56.6		45.9	45.9		7.6			7.6	7.6
Effective Green, g (s)	56.6	56.6	56.6		45.9	45.9		7.6			7.6	7.6
Actuated g/C Ratio	0.76	0.76	0.76		0.62	0.62		0.10			0.10	0.10
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0		3.0			3.0	3.0
Lane Grp Cap (vph)	374	1421	1207		1152	979		139			140	162
v/s Ratio Prot	0.02	c0.33			c0.44							
v/s Ratio Perm	0.21		0.05			0.02		c0.03			0.03	0.01
v/c Ratio	0.31	0.43	0.07		0.72	0.03		0.29			0.29	0.10
Uniform Delay, d1	7.0	3.1	2.2		9.7	5.5		30.8			30.8	30.2
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	0.5	0.4	0.1		2.7	0.0		1.2			1.1	0.3
Delay (s)	7.4	3.6	2.3		12.4	5.5		32.0			31.9	30.5
Level of Service	A	A	A		B	A		C			C	C
Approach Delay (s)		3.9			12.1			32.0			30.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	74.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



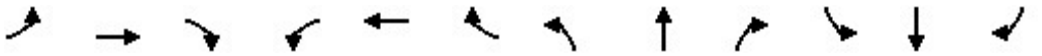
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	340	230	28	4	188	248	5	1	3	451	1	606
Future Volume (veh/h)	340	230	28	4	188	248	5	1	3	451	1	606
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	370	250	30	4	204	270	5	1	3	490	1	659
Approach Volume (veh/h)		650			478			9			1150	
Crossing Volume (veh/h)		495			376			1110			213	
High Capacity (veh/h)		937			1030			569			1172	
High v/c (veh/h)		0.69			0.46			0.02			0.98	
Low Capacity (veh/h)		758			841			437			968	
Low v/c (veh/h)		0.86			0.57			0.02			1.19	

Intersection Summary				
Maximum v/c High	0.98			
Maximum v/c Low	1.19			
Intersection Capacity Utilization	136.8%	ICU Level of Service	H	

Intersection	
Intersection Delay, s/veh	96.5
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	650	478	9	1150
Demand Flow Rate, veh/h	663	487	9	1173
Vehicles Circulating, veh/h	505	383	1132	217
Vehicles Exiting, veh/h	885	758	36	653
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	52.9	15.7	10.3	155.4
Approach LOS	F	C	B	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	663	487	9	1173
Cap Entry Lane, veh/h	682	770	364	910
Entry HV Adj Factor	0.980	0.981	0.998	0.980
Flow Entry, veh/h	650	478	9	1150
Cap Entry, veh/h	669	756	363	892
V/C Ratio	0.972	0.632	0.025	1.290
Control Delay, s/veh	52.9	15.7	10.3	155.4
LOS	F	C	B	F
95th %tile Queue, veh	14	5	0	42



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	736	7	0	929	11	2	0	4	33	0	77
Future Volume (Veh/h)	25	736	7	0	929	11	2	0	4	33	0	77
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	800	8	0	1010	12	2	0	4	36	0	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												10
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		1002			1158							
pX, platoon unblocked	0.62			0.93			0.66	0.66	0.93	0.66	0.66	0.62
vC, conflicting volume	1022			808			1906	1876	800	1868	1872	1010
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	731			753			1866	1820	745	1808	1814	712
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			92	100	99	6	100	69
cM capacity (veh/h)	543			794			24	49	384	38	49	269

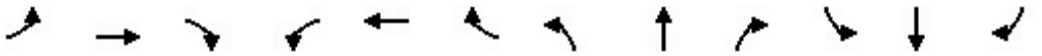
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	27	800	8	0	1010	12	6	120
Volume Left	27	0	0	0	0	0	2	36
Volume Right	0	0	8	0	0	12	4	84
cSH	543	1700	1700	1700	1700	1700	64	128
Volume to Capacity	0.05	0.47	0.00	0.00	0.59	0.01	0.09	0.94
Queue Length 95th (ft)	4	0	0	0	0	0	7	156
Control Delay (s)	12.0	0.0	0.0	0.0	0.0	0.0	66.5	102.8
Lane LOS	B						F	F
Approach Delay (s)	0.4			0.0			66.5	102.8
Approach LOS							F	F

Intersection Summary				
Average Delay	6.6			
Intersection Capacity Utilization	67.0%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	9	20	3	17	155
Future Volume (Veh/h)	13	9	20	3	17	155
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	10	22	3	18	168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	228	24			25	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228	24			25	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	752	1053			1589	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	25	186
Volume Left	14	0	18
Volume Right	10	3	0
cSH	854	1700	1589
Volume to Capacity	0.03	0.01	0.01
Queue Length 95th (ft)	2	0	1
Control Delay (s)	9.3	0.0	0.8
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	0.8
Approach LOS	A		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	102	86	148	238	161	196	821	164	57	347	88
Future Volume (vph)	55	102	86	148	238	161	196	821	164	57	347	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0	7.0		5.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1750		1770	3451		1770	3431	
Flt Permitted	0.29	1.00	1.00	0.63	1.00		0.34	1.00		0.10	1.00	
Satd. Flow (perm)	532	1863	1583	1178	1750		640	3451		185	3431	
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)	60	111	93	161	259	175	213	892	178	62	377	96
RTOR Reduction (vph)	0	0	64	0	7	0	0	10	0	0	14	0
Lane Group Flow (vph)	60	111	29	161	427	0	213	1060	0	62	459	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)	51.3	41.9	41.9	58.3	45.4		60.5	46.8		49.0	40.3	
Effective Green, g (s)	51.3	41.9	41.9	58.3	45.4		60.5	46.8		49.0	40.3	
Actuated g/C Ratio	0.38	0.31	0.31	0.44	0.34		0.45	0.35		0.37	0.30	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	292	585	497	572	596		419	1211		171	1037	
v/s Ratio Prot	0.01	0.06		c0.03	c0.24		c0.06	c0.31		0.02	0.13	
v/s Ratio Perm	0.06		0.02	0.10			0.17			0.11		
v/c Ratio	0.21	0.19	0.06	0.28	0.72		0.51	0.87		0.36	0.44	
Uniform Delay, d1	27.5	33.3	31.9	23.3	38.3		23.4	40.5		30.5	37.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2	0.0	0.3	4.1		1.0	7.9		1.3	0.6	
Delay (s)	27.8	33.5	32.0	23.5	42.4		24.4	48.4		31.8	38.1	
Level of Service	C	C	C	C	D		C	D		C	D	
Approach Delay (s)		31.7			37.3			44.4			37.4	
Approach LOS		C			D			D			D	

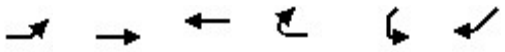
Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	133.3	Sum of lost time (s)	23.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	278	45	12	524	23	9
Future Volume (Veh/h)	278	45	12	524	23	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	302	49	13	570	25	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				842		
pX, platoon unblocked					0.98	
vC, conflicting volume			351		898	302
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			351		887	302
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		92	99
cM capacity (veh/h)			1208		306	738

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	302	49	13	570	35
Volume Left	0	0	13	0	25
Volume Right	0	49	0	0	10
cSH	1700	1700	1208	1700	367
Volume to Capacity	0.18	0.03	0.01	0.34	0.10
Queue Length 95th (ft)	0	0	1	0	8
Control Delay (s)	0.0	0.0	8.0	0.0	15.8
Lane LOS			A		C
Approach Delay (s)	0.0		0.2		15.8
Approach LOS					C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		



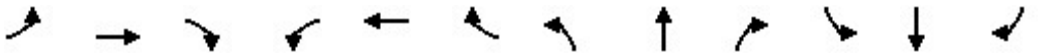
Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	120	167	400	287	171	136
Future Volume (vph)	120	167	400	287	171	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.94		0.94	
Flt Protected		0.98	1.00		0.97	
Satd. Flow (prot)		1825	1758		1704	
Flt Permitted		0.44	1.00		0.97	
Satd. Flow (perm)		812	1758		1704	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	182	435	312	186	148
RTOR Reduction (vph)	0	0	12	0	26	0
Lane Group Flow (vph)	0	312	735	0	308	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		6	2		4	
Permitted Phases	6					
Actuated Green, G (s)		75.2	75.2		25.4	
Effective Green, g (s)		75.2	75.2		25.4	
Actuated g/C Ratio		0.66	0.66		0.22	
Clearance Time (s)		7.0	7.0		6.0	
Vehicle Extension (s)		6.0	6.0		3.0	
Lane Grp Cap (vph)		537	1163		381	
v/s Ratio Prot			c0.42		c0.18	
v/s Ratio Perm		0.38				
v/c Ratio		0.58	0.63		0.81	
Uniform Delay, d1		10.5	11.2		41.8	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		3.1	1.9		12.0	
Delay (s)		13.6	13.0		53.8	
Level of Service		B	B		D	
Approach Delay (s)		13.6	13.0		53.8	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	113.6	Sum of lost time (s)	13.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	414	7	30	972	0	4	0	19	0	0	0
Future Volume (vph)	0	414	7	30	972	0	4	0	19	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		15%			0%			0%			0%	
Total Lost time (s)		6.0		5.0	6.0			6.0				
Lane Util. Factor		1.00		1.00	1.00			1.00				
Frt		1.00		1.00	1.00			0.89				
Flt Protected		1.00		0.95	1.00			0.99				
Satd. Flow (prot)		1719		1770	1863			1638				
Flt Permitted		1.00		0.43	1.00			0.94				
Satd. Flow (perm)		1719		797	1863			1558				
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	450	8	33	1057	0	4	0	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	24	0	0	0	0
Lane Group Flow (vph)	0	458	0	33	1057	0	0	1	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA				
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)		48.4		57.3	57.3			4.4				
Effective Green, g (s)		48.4		57.3	57.3			4.4				
Actuated g/C Ratio		0.66		0.78	0.78			0.06				
Clearance Time (s)		6.0		5.0	6.0			6.0				
Vehicle Extension (s)		5.0		3.0	5.0			3.0				
Lane Grp Cap (vph)		1128		671	1448			93				
v/s Ratio Prot		0.27		0.00	c0.57							
v/s Ratio Perm				0.04				c0.00				
v/c Ratio		0.41		0.05	0.73			0.02				
Uniform Delay, d1		5.9		2.3	4.2			32.6				
Progression Factor		1.00		1.00	1.00			1.00				
Incremental Delay, d2		0.5		0.0	2.3			0.1				
Delay (s)		6.4		2.3	6.5			32.7				
Level of Service		A		A	A			C				
Approach Delay (s)		6.4			6.4			32.7			0.0	
Approach LOS		A			A			C			A	

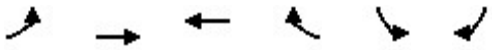
Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	367	169	122	806	47	253	80	81	18	48	13
Future Volume (vph)	14	367	169	122	806	47	253	80	81	18	48	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	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	0.99		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1847		1770	1722		1770	1803	
Flt Permitted	0.13	1.00	1.00	0.48	1.00		0.71	1.00		0.61	1.00	
Satd. Flow (perm)	241	1863	1583	898	1847		1330	1722		1133	1803	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	399	184	133	876	51	275	87	88	20	52	14
RTOR Reduction (vph)	0	0	73	0	2	0	0	26	0	0	7	0
Lane Group Flow (vph)	15	399	111	133	925	0	275	149	0	20	59	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2			8			4		
Actuated Green, G (s)	58.4	58.4	58.4	58.4	58.4		26.6	26.6		26.6	26.6	
Effective Green, g (s)	58.4	58.4	58.4	58.4	58.4		26.6	26.6		26.6	26.6	
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.27	0.27		0.27	0.27	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	6.0	6.0	6.0	6.0	6.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	145	1121	953	540	1112		364	472		310	494	
v/s Ratio Prot		0.21			c0.50			0.09			0.03	
v/s Ratio Perm	0.06		0.07	0.15			c0.21			0.02		
v/c Ratio	0.10	0.36	0.12	0.25	0.83		0.76	0.32		0.06	0.12	
Uniform Delay, d1	8.2	9.8	8.3	9.0	15.4		32.2	28.0		26.0	26.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.5	0.2	0.7	6.3		8.6	0.4		0.1	0.1	
Delay (s)	9.1	10.3	8.4	9.7	21.7		40.9	28.4		26.1	26.5	
Level of Service	A	B	A	A	C		D	C		C	C	
Approach Delay (s)		9.7			20.2			36.0			26.4	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

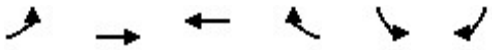
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	461	970	25	12	5
Future Volume (Veh/h)	5	461	970	25	12	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	501	1054	27	13	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		870				
pX, platoon unblocked					0.89	
vC, conflicting volume	1081				1565	1054
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1081				1573	1054
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	98
cM capacity (veh/h)	645				108	275

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	5	501	1054	27	18
Volume Left	5	0	0	0	13
Volume Right	0	0	0	27	5
cSH	645	1700	1700	1700	130
Volume to Capacity	0.01	0.29	0.62	0.02	0.14
Queue Length 95th (ft)	1	0	0	0	12
Control Delay (s)	10.6	0.0	0.0	0.0	37.2
Lane LOS	B				E
Approach Delay (s)	0.1		0.0		37.2
Approach LOS					E

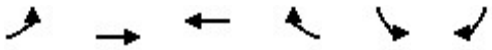
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	461	987	35	19	8
Future Volume (Veh/h)	12	461	987	35	19	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	501	1073	38	21	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1111				1600	1073
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1111				1600	1073
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				82	97
cM capacity (veh/h)	629				114	268

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	13	501	1073	38	30
Volume Left	13	0	0	0	21
Volume Right	0	0	0	38	9
cSH	629	1700	1700	1700	138
Volume to Capacity	0.02	0.29	0.63	0.02	0.22
Queue Length 95th (ft)	2	0	0	0	20
Control Delay (s)	10.8	0.0	0.0	0.0	38.2
Lane LOS	B				E
Approach Delay (s)	0.3		0.0		38.2
Approach LOS					E

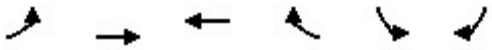
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	455	1003	41	28	19
Future Volume (Veh/h)	25	455	1003	41	28	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	495	1090	45	30	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			1224			
pX, platoon unblocked	0.57				0.57	0.57
vC, conflicting volume	1135				1639	1090
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	854				1746	774
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				40	91
cM capacity (veh/h)	444				50	225

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	522	1090	45	51
Volume Left	27	0	0	30
Volume Right	0	0	45	21
cSH	444	1700	1700	74
Volume to Capacity	0.06	0.64	0.03	0.69
Queue Length 95th (ft)	5	0	0	79
Control Delay (s)	1.8	0.0	0.0	125.2
Lane LOS	A			F
Approach Delay (s)	1.8	0.0		125.2
Approach LOS				F

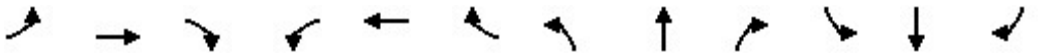
Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	479	1039	3	0	5
Future Volume (Veh/h)	4	479	1039	3	0	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	521	1129	3	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						6
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			590			
pX, platoon unblocked	0.58				0.58	0.58
vC, conflicting volume	1132				1658	1129
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	860				1775	855
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	449				52	206

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	4	521	1129	3	5
Volume Left	4	0	0	0	0
Volume Right	0	0	0	3	5
cSH	449	1700	1700	1700	0
Volume to Capacity	0.01	0.31	0.66	0.00	Err
Queue Length 95th (ft)	1	0	0	0	Err
Control Delay (s)	13.1	0.0	0.0	0.0	Err
Lane LOS	B				F
Approach Delay (s)	0.1		0.0		Err
Approach LOS					F

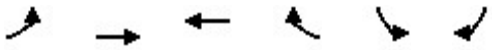
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	352	106	79	793	86	211	34	135	105	55	38
Future Volume (vph)	21	352	106	79	793	86	211	34	135	105	55	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	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	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1798		1770	1863	1583		1786	1583		1804	1583
Flt Permitted	0.10	1.00		0.31	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	179	1798		584	1863	1583		1786	1583		1804	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	383	115	86	862	93	229	37	147	114	60	41
RTOR Reduction (vph)	0	4	0	0	0	28	0	0	87	0	0	36
Lane Group Flow (vph)	23	494	0	86	862	65	0	266	60	0	174	5
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	6			2		2			4			3
Actuated Green, G (s)	89.2	85.5		99.7	91.0	91.0		31.6	31.6		22.2	22.2
Effective Green, g (s)	89.2	85.5		99.7	91.0	91.0		31.6	31.6		22.2	22.2
Actuated g/C Ratio	0.52	0.50		0.58	0.53	0.53		0.19	0.19		0.13	0.13
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0		5.5	5.5		5.5	5.5
Vehicle Extension (s)	2.5	6.0		2.5	6.0	6.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	128	901		405	994	844		331	293		234	206
v/s Ratio Prot	0.00	0.27		c0.01	c0.46			c0.15			c0.10	
v/s Ratio Perm	0.09			0.11		0.04			0.04			0.00
v/c Ratio	0.18	0.55		0.21	0.87	0.08		0.80	0.20		0.74	0.03
Uniform Delay, d1	31.2	29.2		18.7	34.5	19.3		66.5	58.8		71.4	64.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	1.5		0.2	9.1	0.1		13.2	0.3		12.0	0.1
Delay (s)	31.7	30.8		18.9	43.7	19.4		79.7	59.2		83.4	64.8
Level of Service	C	C		B	D	B		E	E		F	E
Approach Delay (s)		30.8			39.4			72.4			79.9	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	170.5	Sum of lost time (s)	22.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

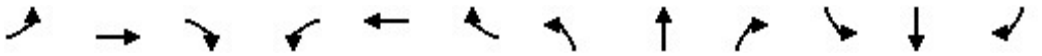
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	579	945	97	25	13
Future Volume (Veh/h)	13	579	945	97	25	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	629	1027	105	27	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1132				1684	1027
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1132				1684	1027
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				73	95
cM capacity (veh/h)	617				101	285

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	14	629	1027	105	41
Volume Left	14	0	0	0	27
Volume Right	0	0	0	105	14
cSH	617	1700	1700	1700	130
Volume to Capacity	0.02	0.37	0.60	0.06	0.32
Queue Length 95th (ft)	2	0	0	0	31
Control Delay (s)	11.0	0.0	0.0	0.0	45.1
Lane LOS	B				E
Approach Delay (s)	0.2		0.0		45.1
Approach LOS					E

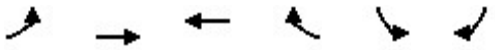
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	597	5	20	1036	5	4	0	8	4	0	2
Future Volume (Veh/h)	2	597	5	20	1036	5	4	0	8	4	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	649	5	22	1126	5	4	0	9	4	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1131			654			1828	1830	652	1828	1828	1126
vC1, stage 1 conf vol							656	656		1170	1170	
vC2, stage 2 conf vol							1172	1175		658	658	
vCu, unblocked vol	1131			654			1828	1830	652	1828	1828	1126
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			98	100	98	98	100	99
cM capacity (veh/h)	618			933			201	228	468	202	228	249

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	2	654	22	1126	5	13	6
Volume Left	2	0	22	0	0	4	4
Volume Right	0	5	0	0	5	9	2
cSH	618	1700	933	1700	1700	654	215
Volume to Capacity	0.00	0.38	0.02	0.66	0.00	0.02	0.03
Queue Length 95th (ft)	0	0	2	0	0	2	2
Control Delay (s)	10.8	0.0	9.0	0.0	0.0	16.0	22.2
Lane LOS	B		A			C	C
Approach Delay (s)	0.0		0.2			16.0	22.2
Approach LOS						C	C

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	65.0%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	577	1049	116	64	12
Future Volume (Veh/h)	32	577	1049	116	64	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	627	1140	126	70	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		TWLTL	None			
Median storage veh)		2				
Upstream signal (ft)			1305			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	1266				1837	1140
vC1, stage 1 conf vol					1140	
vC2, stage 2 conf vol					697	
vCu, unblocked vol	1240				1875	1099
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	93				71	94
cM capacity (veh/h)	505				244	232

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	35	627	1140	126	83
Volume Left	35	0	0	0	70
Volume Right	0	0	0	126	13
cSH	505	1700	1700	1700	289
Volume to Capacity	0.07	0.37	0.67	0.07	0.29
Queue Length 95th (ft)	6	0	0	0	29
Control Delay (s)	12.7	0.0	0.0	0.0	25.0
Lane LOS	B				C
Approach Delay (s)	0.7		0.0		25.0
Approach LOS					C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	635	6	35	1162	3	30
Future Volume (Veh/h)	635	6	35	1162	3	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	690	7	38	1263	3	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				487		
pX, platoon unblocked						
vC, conflicting volume			697		1401	694
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			697		1401	694
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	91
cM capacity (veh/h)			895		126	386

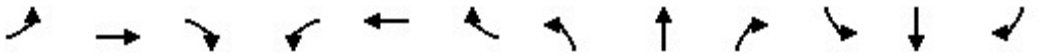
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	697	459	842	36
Volume Left	0	38	0	3
Volume Right	7	0	0	33
cSH	1700	895	1700	329
Volume to Capacity	0.41	0.04	0.50	0.11
Queue Length 95th (ft)	0	3	0	9
Control Delay (s)	0.0	1.2	0.0	17.3
Lane LOS		A		C
Approach Delay (s)	0.0	0.4		17.3
Approach LOS				C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	239	426	673	360	837	667
Future Volume (vph)	239	426	673	360	837	667
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	4.0	5.0	7.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	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	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	260	463	732	391	910	725
RTOR Reduction (vph)	0	0	0	0	0	328
Lane Group Flow (vph)	260	463	732	391	910	397
Turn Type	NA	Free	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		Free				4
Actuated Green, G (s)	24.2	119.3	33.3	62.5	43.8	43.8
Effective Green, g (s)	24.2	119.3	33.3	62.5	43.8	43.8
Actuated g/C Ratio	0.20	1.00	0.28	0.52	0.37	0.37
Clearance Time (s)	7.0		5.0	7.0	6.0	6.0
Vehicle Extension (s)	6.0		3.0	6.0	3.5	3.5
Lane Grp Cap (vph)	377	1583	958	976	1260	581
v/s Ratio Prot	c0.14		c0.21	0.21	c0.27	
v/s Ratio Perm		0.29				0.25
v/c Ratio	0.69	0.29	0.76	0.40	0.72	0.68
Uniform Delay, d1	44.1	0.0	39.4	17.1	32.5	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.8	0.5	3.7	0.8	2.1	3.4
Delay (s)	51.9	0.5	43.1	17.9	34.7	35.3
Level of Service	D	A	D	B	C	D
Approach Delay (s)	19.0			34.3	34.9	
Approach LOS	B			C	C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	119.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

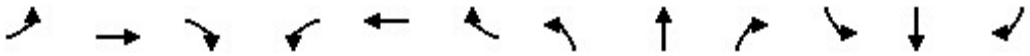
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	675	25	9	885	44	14	2	5	38	2	119
Future Volume (vph)	126	675	25	9	885	44	14	2	5	38	2	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	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		0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97			0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		1746			1778	1583
Flt Permitted	0.11	1.00	1.00	0.35	1.00	1.00		0.77			0.72	1.00
Satd. Flow (perm)	211	1863	1583	645	1863	1583		1393			1341	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	734	27	10	962	48	15	2	5	41	2	129
RTOR Reduction (vph)	0	0	8	0	0	18	0	5	0	0	0	116
Lane Group Flow (vph)	137	734	19	10	962	30	0	17	0	0	43	13
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2		2	4			8		8
Actuated Green, G (s)	61.8	55.7	55.7	50.5	49.4	49.4		7.8			7.8	7.8
Effective Green, g (s)	61.8	55.7	55.7	50.5	49.4	49.4		7.8			7.8	7.8
Actuated g/C Ratio	0.78	0.70	0.70	0.63	0.62	0.62		0.10			0.10	0.10
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0		3.0			3.0	3.0
Lane Grp Cap (vph)	308	1303	1107	424	1156	982		136			131	155
v/s Ratio Prot	c0.04	c0.39		0.00	c0.52							
v/s Ratio Perm	0.30		0.01	0.01		0.02		0.01			c0.03	0.01
v/c Ratio	0.44	0.56	0.02	0.02	0.83	0.03		0.13			0.33	0.08
Uniform Delay, d1	12.0	5.9	3.6	5.5	11.8	5.8		32.8			33.5	32.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	1.0	0.9	0.0	0.0	5.8	0.0		0.4			1.5	0.2
Delay (s)	13.1	6.8	3.6	5.5	17.7	5.9		33.2			34.9	32.9
Level of Service	B	A	A	A	B	A		C			C	C
Approach Delay (s)		7.7			17.0			33.2			33.4	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	79.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



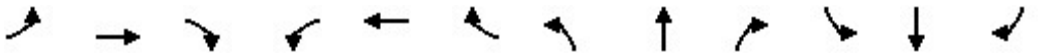
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	472	244	2	1	288	353	7	4	2	247	0	643
Future Volume (veh/h)	472	244	2	1	288	353	7	4	2	247	0	643
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	513	265	2	1	313	384	8	4	2	268	0	699
Approach Volume (veh/h)		780			698			14			967	
Crossing Volume (veh/h)		269			525			1046			322	
High Capacity (veh/h)		1121			915			599			1075	
High v/c (veh/h)		0.70			0.76			0.02			0.90	
Low Capacity (veh/h)		923			738			463			881	
Low v/c (veh/h)		0.85			0.95			0.03			1.10	

Intersection Summary				
Maximum v/c High	0.90			
Maximum v/c Low	1.10			
Intersection Capacity Utilization	142.2%	ICU Level of Service		H

Intersection	
Intersection Delay, s/veh	84.8
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	780	698	14	967
Demand Flow Rate, veh/h	795	712	14	986
Vehicles Circulating, veh/h	274	535	1066	328
Vehicles Exiting, veh/h	1040	545	3	919
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	37.5	82.2	9.8	125.8
Approach LOS	E	F	A	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	795	712	14	986
Cap Entry Lane, veh/h	859	662	389	814
Entry HV Adj Factor	0.981	0.980	0.994	0.981
Flow Entry, veh/h	780	698	14	967
Cap Entry, veh/h	843	649	387	798
V/C Ratio	0.925	1.076	0.036	1.211
Control Delay, s/veh	37.5	82.2	9.8	125.8
LOS	E	F	A	F
95th %tile Queue, veh	14	20	0	32



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	801	20	0	982	36	1	0	4	21	0	50
Future Volume (Veh/h)	85	801	20	0	982	36	1	0	4	21	0	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	871	22	0	1067	39	1	0	4	23	0	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												10
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		1002			1158							
pX, platoon unblocked	0.47			0.91			0.51	0.51	0.91	0.51	0.51	0.47
vC, conflicting volume	1106			893			2149	2161	871	2126	2144	1067
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	656			831			2357	2380	807	2312	2347	572
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	79			100			88	100	99	0	100	78
cM capacity (veh/h)	435			727			8	14	346	11	15	242

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	92	871	22	0	1067	39	5	77
Volume Left	92	0	0	0	0	0	1	23
Volume Right	0	0	22	0	0	39	4	54
cSH	435	1700	1700	1700	1700	1700	38	38
Volume to Capacity	0.21	0.51	0.01	0.00	0.63	0.02	0.13	2.03
Queue Length 95th (ft)	20	0	0	0	0	0	10	209
Control Delay (s)	15.5	0.0	0.0	0.0	0.0	0.0	114.5	358.0
Lane LOS	C						F	F
Approach Delay (s)	1.4			0.0			114.5	358.0
Approach LOS							F	F

Intersection Summary				
Average Delay	13.6			
Intersection Capacity Utilization	70.8%	ICU Level of Service		C
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	17	140	7	13	74
Future Volume (Veh/h)	4	17	140	7	13	74
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	18	152	8	14	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	264	156			160	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	264	156			160	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	718	890			1419	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	160	94
Volume Left	4	0	14
Volume Right	18	8	0
cSH	853	1700	1419
Volume to Capacity	0.03	0.09	0.01
Queue Length 95th (ft)	2	0	1
Control Delay (s)	9.3	0.0	1.2
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	1.2
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		