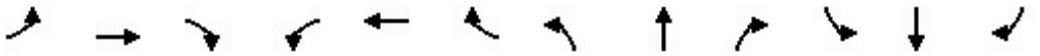
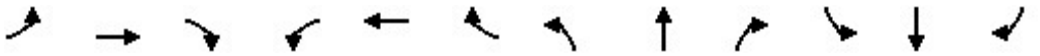


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	385	495	185	985	0	0	0	0	130	5	300
Future Volume (vph)	0	385	495	185	985	0	0	0	0	130	5	300
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0	4.6	5.0						5.0	5.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.97	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	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)		3260	1416	1646	3292						1637	1458
Flt Permitted		1.00	1.00	0.45	1.00						0.95	1.00
Satd. Flow (perm)		3260	1416	781	3292						1637	1458
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	385	495	185	985	0	0	0	0	130	5	300
RTOR Reduction (vph)	0	0	301	0	0	0	0	0	0	0	0	101
Lane Group Flow (vph)	0	385	194	185	985	0	0	0	0	0	135	199
Confl. Peds. (#/hr)			6									
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	2%	2%	2%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		24.7	24.7	32.6	27.0						30.9	30.9
Effective Green, g (s)		24.7	24.7	32.6	27.0						30.9	30.9
Actuated g/C Ratio		0.33	0.33	0.43	0.36						0.41	0.41
Clearance Time (s)		5.0	5.0	4.6	5.0						5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1062	461	399	1172						667	594
v/s Ratio Prot		0.12		c0.03	c0.30							
v/s Ratio Perm			0.14	0.16							0.08	c0.14
v/c Ratio		0.36	0.42	0.46	0.84						0.20	0.33
Uniform Delay, d1		19.5	20.0	14.0	22.4						14.5	15.4
Progression Factor		1.00	1.00	0.98	1.00						1.00	1.00
Incremental Delay, d2		0.2	0.6	0.7	4.9						0.2	0.3
Delay (s)		19.7	20.6	14.4	27.3						14.6	15.7
Level of Service		B	C	B	C						B	B
Approach Delay (s)		20.2			25.2			0.0			15.4	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	14.6
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		

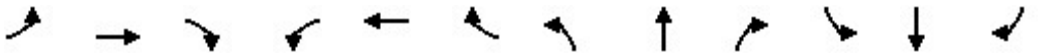
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	390	0	0	470	95	700	5	255	0	0	0
Future Volume (vph)	125	390	0	0	470	95	700	5	255	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.6	5.0			5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.97	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.92				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (prot)	1646	3292			3292	1436	1564	1466				
Flt Permitted	0.47	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (perm)	820	3292			3292	1436	1564	1466				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	390	0	0	470	95	700	5	255	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	55	0	57	0	0	0	0
Lane Group Flow (vph)	125	390	0	0	470	40	497	406	0	0	0	0
Confl. Peds. (#/hr)						3			3			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	28.0	24.7			27.0	27.0	30.9	30.9				
Effective Green, g (s)	28.0	24.7			27.0	27.0	30.9	30.9				
Actuated g/C Ratio	0.37	0.33			0.36	0.36	0.41	0.41				
Clearance Time (s)	4.6	5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	338	1072			1172	511	637	597				
v/s Ratio Prot	c0.02	0.12			c0.14							
v/s Ratio Perm	0.12					0.03	c0.32	0.28				
v/c Ratio	0.37	0.36			0.40	0.08	0.78	0.68				
Uniform Delay, d1	16.4	19.5			18.3	16.2	19.5	18.4				
Progression Factor	0.61	0.57			1.00	1.00	1.00	1.00				
Incremental Delay, d2	0.7	0.2			0.2	0.1	6.2	3.2				
Delay (s)	10.6	11.3			18.6	16.2	25.7	21.6				
Level of Service	B	B			B	B	C	C				
Approach Delay (s)		11.1			18.2			23.7			0.0	
Approach LOS		B			B			C			A	

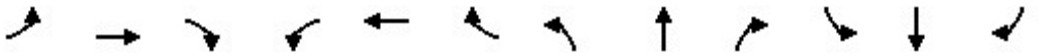
Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	14.6
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



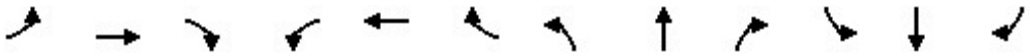
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	250	55	140	260	35	65	220	145	50	395	110
Future Volume (vph)	70	250	55	140	260	35	65	220	145	50	395	110
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98
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	0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1614	3125		1630	3193		1614	1699	1424	1630	1716	1435
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1614	3125		1630	3193		1614	1699	1424	1630	1716	1435
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	250	55	140	260	35	65	220	145	50	395	110
RTOR Reduction (vph)	0	25	0	0	13	0	0	0	101	0	0	77
Lane Group Flow (vph)	70	280	0	140	282	0	65	220	44	50	395	33
Confl. Peds. (#/hr)	2		6	6		2	5		3	3		5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	3.8	14.7		6.3	17.2		3.8	19.4	19.4	3.2	18.8	18.8
Effective Green, g (s)	3.8	14.7		6.3	17.2		3.8	19.4	19.4	3.2	18.8	18.8
Actuated g/C Ratio	0.06	0.23		0.10	0.27		0.06	0.31	0.31	0.05	0.30	0.30
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	96	722		161	863		96	518	434	82	507	424
v/s Ratio Prot	0.04	c0.09		c0.09	0.09		c0.04	0.13		0.03	c0.23	
v/s Ratio Perm									0.03			0.02
v/c Ratio	0.73	0.39		0.87	0.33		0.68	0.42	0.10	0.61	0.78	0.08
Uniform Delay, d1	29.4	20.7		28.2	18.6		29.3	17.6	15.9	29.6	20.5	16.1
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	20.7	0.1		34.9	0.1		13.9	0.2	0.0	8.5	6.8	0.0
Delay (s)	50.1	20.8		63.2	18.6		43.2	17.8	15.9	38.1	27.3	16.2
Level of Service	D	C		E	B		D	B	B	D	C	B
Approach Delay (s)		26.3			33.0			21.0			26.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	63.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.6%	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)	65	140	70	15	175	25	75	90	10	25	165	55
Future Volume (vph)	65	140	70	15	175	25	75	90	10	25	165	55
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			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.97	
Flt Protected		0.99			1.00			0.98			0.99	
Satd. Flow (prot)		1612			1650			1698			1632	
Flt Permitted		0.88			0.97			0.82			0.94	
Satd. Flow (perm)		1431			1601			1421			1546	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	65	140	70	15	175	25	75	90	10	25	165	55
RTOR Reduction (vph)	0	20	0	0	8	0	0	3	0	0	16	0
Lane Group Flow (vph)	0	255	0	0	207	0	0	172	0	0	229	0
Confl. Peds. (#/hr)			4	4			1					1
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		12.8			12.8			7.8			7.8	
Effective Green, g (s)		12.8			12.8			7.8			7.8	
Actuated g/C Ratio		0.42			0.42			0.25			0.25	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		598			669			362			394	
v/s Ratio Prot												
v/s Ratio Perm		c0.18			0.13			0.12			c0.15	
v/c Ratio		0.43			0.31			0.48			0.58	
Uniform Delay, d1		6.3			5.9			9.7			10.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.1			0.4			1.4	
Delay (s)		6.5			6.0			10.0			11.4	
Level of Service		A			A			B			B	
Approach Delay (s)		6.5			6.0			10.0			11.4	
Approach LOS		A			A			B			B	

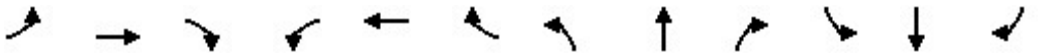
Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	30.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	5	130	10	10	5	170	260	10	10	300	45
Future Volume (Veh/h)	40	5	130	10	10	5	170	260	10	10	300	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	5	130	10	10	5	170	260	10	10	300	45
Pedestrians		4			2			1				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	962	958	328	1083	976	267	349			272		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	962	958	328	1083	976	267	349			272		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	98	82	93	95	99	86			99		
cM capacity (veh/h)	199	218	711	139	215	775	1200			1283		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	175	25	440	355
Volume Left	40	10	170	10
Volume Right	130	5	10	45
cSH	430	200	1200	1283
Volume to Capacity	0.41	0.13	0.14	0.01
Queue Length 95th (ft)	49	11	12	1
Control Delay (s)	19.0	25.6	4.2	0.3
Lane LOS	C	D	A	A
Approach Delay (s)	19.0	25.6	4.2	0.3
Approach LOS	C	D		

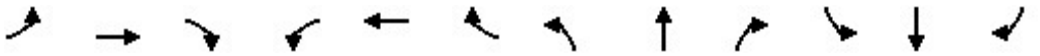
Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	275	55	35	275	25	35	75	35	50	200	70
Future Volume (vph)	40	275	55	35	275	25	35	75	35	50	200	70
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			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.97			0.97	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1682			1703			1673			1645	
Flt Permitted		0.93			0.93			0.86			0.93	
Satd. Flow (perm)		1578			1597			1462			1540	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	275	55	35	275	25	35	75	35	50	200	70
RTOR Reduction (vph)	0	11	0	0	5	0	0	14	0	0	12	0
Lane Group Flow (vph)	0	359	0	0	330	0	0	131	0	0	308	0
Confl. Peds. (#/hr)	5		3	3		5	1					1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		15.4			15.4			13.2			13.2	
Effective Green, g (s)		15.4			15.4			13.2			13.2	
Actuated g/C Ratio		0.40			0.40			0.34			0.34	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		629			637			499			526	
v/s Ratio Prot												
v/s Ratio Perm		c0.23			0.21			0.09			c0.20	
v/c Ratio		0.57			0.52			0.26			0.59	
Uniform Delay, d1		9.0			8.8			9.2			10.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.3			0.7			0.3			1.7	
Delay (s)		10.3			9.5			9.5			12.1	
Level of Service		B			A			A			B	
Approach Delay (s)		10.3			9.5			9.5			12.1	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	38.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	60.1%	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)	50	150	60	70	125	35	105	390	130	45	450	75
Future Volume (vph)	50	150	60	70	125	35	105	390	130	45	450	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	16	16	16	16	16	16	12	12	12	12	12	12
Total Lost time (s)		8.3			8.3		8.0	8.0		8.0	8.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	0.96		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1873			1886		1630	1651		1614	1663	
Flt Permitted		0.89			0.83		0.38	1.00		0.39	1.00	
Satd. Flow (perm)		1683			1592		659	1651		661	1663	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	150	60	70	125	35	105	390	130	45	450	75
RTOR Reduction (vph)	0	14	0	0	8	0	0	18	0	0	9	0
Lane Group Flow (vph)	0	246	0	0	222	0	105	502	0	45	516	0
Confl. Peds. (#/hr)	2		3	3		2						
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		13.8			13.8		24.2	24.2		24.2	24.2	
Effective Green, g (s)		13.8			13.8		24.2	24.2		24.2	24.2	
Actuated g/C Ratio		0.25			0.25		0.45	0.45		0.45	0.45	
Clearance Time (s)		8.3			8.3		8.0	8.0		8.0	8.0	
Vehicle Extension (s)		3.0			3.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		427			404		293	735		294	741	
v/s Ratio Prot								0.30			c0.31	
v/s Ratio Perm		c0.15			0.14		0.16			0.07		
v/c Ratio		0.58			0.55		0.36	0.68		0.15	0.70	
Uniform Delay, d1		17.7			17.6		9.9	12.0		9.0	12.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9			1.5		0.3	2.1		0.1	2.3	
Delay (s)		19.6			19.1		10.2	14.1		9.0	14.4	
Level of Service		B			B		B	B		A	B	
Approach Delay (s)		19.6			19.1			13.4			14.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	54.3	Sum of lost time (s)	16.3
Intersection Capacity Utilization	79.4%	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)	305	20	10	220	10	15
Future Volume (Veh/h)	305	20	10	220	10	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	305	20	10	220	10	15
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	956					
pX, platoon unblocked						
vC, conflicting volume			333		563	323
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			333		563	323
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		98	98
cM capacity (veh/h)			1229		484	718

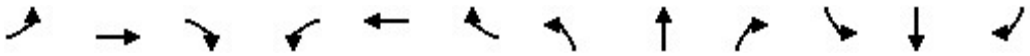
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	325	230	25
Volume Left	0	10	10
Volume Right	20	0	15
cSH	1700	1229	601
Volume to Capacity	0.19	0.01	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	0.4	11.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	11.2
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		31.4%	ICU Level of Service
Analysis Period (min)		15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	60	155	110	200	280	75
Future Volume (vph)	60	155	110	200	280	75
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	155	110	200	280	75

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	215	310	355
Volume Left (vph)	60	110	0
Volume Right (vph)	155	0	75
Hadj (s)	-0.34	0.10	-0.08
Departure Headway (s)	5.1	5.0	4.8
Degree Utilization, x	0.31	0.43	0.48
Capacity (veh/h)	634	682	713
Control Delay (s)	10.4	11.9	12.1
Approach Delay (s)	10.4	11.9	12.1
Approach LOS	B	B	B

Intersection Summary			
Delay	11.6		
Level of Service	B		
Intersection Capacity Utilization	63.1%	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)	5	5	10	10	10	15	10	290	15	30	400	5
Future Volume (Veh/h)	5	5	10	10	10	15	10	290	15	30	400	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	5	10	10	10	15	10	290	15	30	400	5
Pedestrians		2									5	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	807	790	404	792	784	302	407			305		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	807	790	404	792	784	302	407			305		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	97	97	98	99			98		
cM capacity (veh/h)	280	314	649	293	316	739	1150			1250		

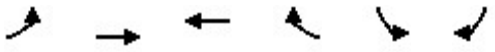
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	20	35	315	435
Volume Left	5	10	10	30
Volume Right	10	15	15	5
cSH	407	406	1150	1250
Volume to Capacity	0.05	0.09	0.01	0.02
Queue Length 95th (ft)	4	7	1	2
Control Delay (s)	14.3	14.7	0.3	0.8
Lane LOS	B	B	A	A
Approach Delay (s)	14.3	14.7	0.3	0.8
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	40	25	450	535	10
Future Volume (Veh/h)	10	40	25	450	535	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	40	25	450	535	10
Pedestrians	5				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1046	545	550			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1046	545	550			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	93	98			
cM capacity (veh/h)	248	540	1015			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	50	475	545
Volume Left	10	25	0
Volume Right	40	0	10
cSH	437	1015	1700
Volume to Capacity	0.11	0.02	0.32
Queue Length 95th (ft)	10	2	0
Control Delay (s)	14.3	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	14.3	0.7	0.0
Approach LOS	B		

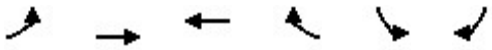
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	440	235	0	105	435
Future Volume (Veh/h)	0	440	235	0	105	435
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	440	235	0	105	435
Pedestrians					1	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	236				676	236
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	236				676	236
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				75	46
cM capacity (veh/h)	1324				419	802

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	440	235	105	435
Volume Left	0	0	105	0
Volume Right	0	0	0	435
cSH	1700	1700	419	802
Volume to Capacity	0.26	0.14	0.25	0.54
Queue Length 95th (ft)	0	0	25	83
Control Delay (s)	0.0	0.0	16.5	14.7
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	15.0	
Approach LOS			C	

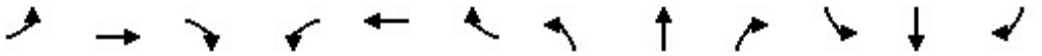
Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	240	305	235	60	0	0
Future Volume (Veh/h)	240	305	235	60	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	240	305	235	60	0	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)						
pX, platoon unblocked						
vC, conflicting volume	235				1050	265
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	235				1050	265
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				100	100
cM capacity (veh/h)	1326				208	779

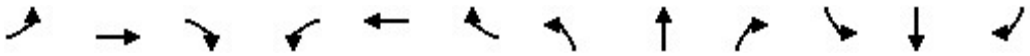
Direction, Lane #	EB 1	WB 1
Volume Total	545	295
Volume Left	240	0
Volume Right	0	60
cSH	1326	1700
Volume to Capacity	0.18	0.17
Queue Length 95th (ft)	16	0
Control Delay (s)	4.7	0.0
Lane LOS	A	
Approach Delay (s)	4.7	0.0
Approach LOS		

Intersection Summary				
Average Delay		3.0		
Intersection Capacity Utilization		55.9%	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)	45	160	65	245	215	50	40	440	380	50	400	65
Future Volume (vph)	45	160	65	245	215	50	40	440	380	50	400	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	10.0		5.0	10.0		5.0	10.0	10.0	5.0	10.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	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	
Frt	1.00	0.96		1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1568	1570		1599	1628		1614	1699	1401	1599	1647	
Flt Permitted	0.95	1.00		0.61	1.00		0.29	1.00	1.00	0.32	1.00	
Satd. Flow (perm)	1568	1570		1028	1628		495	1699	1401	531	1647	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	160	65	245	215	50	40	440	380	50	400	65
RTOR Reduction (vph)	0	14	0	0	8	0	0	0	257	0	5	0
Lane Group Flow (vph)	45	211	0	245	257	0	40	440	123	50	460	0
Confl. Peds. (#/hr)						1			4			
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	3%	3%	3%	4%	4%	4%
Turn Type	Prot	NA		D.P+P	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases				8			6		6	2		
Actuated Green, G (s)	3.9	21.9		30.1	26.2		33.3	29.2	29.2	33.9	29.5	
Effective Green, g (s)	3.9	21.9		30.1	26.2		33.3	29.2	29.2	33.9	29.5	
Actuated g/C Ratio	0.04	0.23		0.32	0.28		0.36	0.31	0.31	0.36	0.31	
Clearance Time (s)	5.0	10.0		5.0	10.0		5.0	10.0	10.0	5.0	10.0	
Vehicle Extension (s)	3.0	2.0		3.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	65	366		380	455		224	529	436	242	518	
v/s Ratio Prot	0.03	0.13		c0.06	c0.16		0.01	0.26		c0.01	c0.28	
v/s Ratio Perm				c0.15			0.06		0.09	0.07		
v/c Ratio	0.69	0.58		0.64	0.57		0.18	0.83	0.28	0.21	0.89	
Uniform Delay, d1	44.3	31.8		28.5	28.9		20.8	30.0	24.3	20.4	30.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	27.3	1.4		3.7	1.0		0.4	10.3	0.1	0.4	16.2	
Delay (s)	71.6	33.2		32.2	29.8		21.2	40.2	24.5	20.8	46.7	
Level of Service	E	C		C	C		C	D	C	C	D	
Approach Delay (s)		39.6			31.0			32.4			44.2	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	30.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	35	45	65	30	15	30	85	250	45	60	310	50
Future Volume (vph)	35	45	65	30	15	30	85	250	45	60	310	50
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	45	65	30	15	30	85	250	45	60	310	50

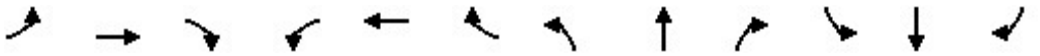
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	145	75	380	420
Volume Left (vph)	35	30	85	60
Volume Right (vph)	65	30	45	50
Hadj (s)	-0.07	-0.13	0.02	-0.01
Departure Headway (s)	6.0	6.2	5.2	5.1
Degree Utilization, x	0.24	0.13	0.55	0.60
Capacity (veh/h)	513	477	653	674
Control Delay (s)	11.0	10.1	14.5	15.6
Approach Delay (s)	11.0	10.1	14.5	15.6
Approach LOS	B	B	B	C

Intersection Summary				
Delay	14.1			
Level of Service	B			
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	75	95	285	60	95	310
Future Volume (Veh/h)	75	95	285	60	95	310
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	75	95	285	60	95	310
Pedestrians	1					2
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			667			
pX, platoon unblocked	0.99	0.99			0.99	
vC, conflicting volume	816	318			346	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	808	304			332	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	87			92	
cM capacity (veh/h)	320	728			1201	

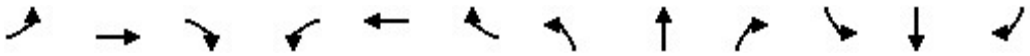
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	170	345	405
Volume Left	75	0	95
Volume Right	95	60	0
cSH	466	1700	1201
Volume to Capacity	0.37	0.20	0.08
Queue Length 95th (ft)	41	0	6
Control Delay (s)	17.1	0.0	2.5
Lane LOS	C		A
Approach Delay (s)	17.1	0.0	2.5
Approach LOS	C		

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		64.8%	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)	25	20	335	10	15	15	180	305	25	30	315	40
Future Volume (vph)	25	20	335	10	15	15	180	305	25	30	315	40
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		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	
Frpb, ped/bikes	1.00	0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86			0.95		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	1443			1593		1613	1677		1597	1649	
Flt Permitted	0.73	1.00			0.62		0.35	1.00		0.56	1.00	
Satd. Flow (perm)	1254	1443			1002		590	1677		944	1649	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	20	335	10	15	15	180	305	25	30	315	40
RTOR Reduction (vph)	0	272	0	0	12	0	0	3	0	0	5	0
Lane Group Flow (vph)	25	83	0	0	28	0	180	327	0	30	350	0
Confl. Peds. (#/hr)			1	1			2		1	1		2
Confl. Bikes (#/hr)									1			3
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.1	9.1			9.1		29.5	29.5		16.5	16.5	
Effective Green, g (s)	9.1	9.1			9.1		29.5	29.5		16.5	16.5	
Actuated g/C Ratio	0.19	0.19			0.19		0.61	0.61		0.34	0.34	
Clearance Time (s)	5.0	5.0			5.0		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	
Lane Grp Cap (vph)	234	270			187		526	1017		320	559	
v/s Ratio Prot		c0.06					0.06	c0.19			c0.21	
v/s Ratio Perm	0.02				0.03		0.15			0.03		
v/c Ratio	0.11	0.31			0.15		0.34	0.32		0.09	0.63	
Uniform Delay, d1	16.4	17.0			16.5		5.0	4.7		10.9	13.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.6			0.4		0.4	0.2		0.1	2.2	
Delay (s)	16.6	17.7			16.9		5.4	4.8		11.1	15.6	
Level of Service	B	B			B		A	A		B	B	
Approach Delay (s)		17.6			16.9			5.0			15.3	
Approach LOS		B			B			A			B	

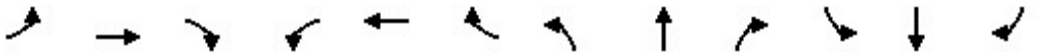
Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	48.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	180	40	70	270	90	60	165	55	180	330	15
Future Volume (vph)	5	180	40	70	270	90	60	165	55	180	330	15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	180	40	70	270	90	60	165	55	180	330	15

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	225	430	60	220	180	345
Volume Left (vph)	5	70	60	0	180	0
Volume Right (vph)	40	90	0	55	0	15
Hadj (s)	-0.10	-0.08	0.52	-0.16	0.53	0.00
Departure Headway (s)	7.7	7.0	8.7	8.0	8.3	7.7
Degree Utilization, x	0.48	0.84	0.15	0.49	0.41	0.74
Capacity (veh/h)	422	430	371	407	419	450
Control Delay (s)	17.5	36.6	12.0	17.4	15.8	28.4
Approach Delay (s)	17.5	36.6	16.2		24.1	
Approach LOS	C	E	C		C	

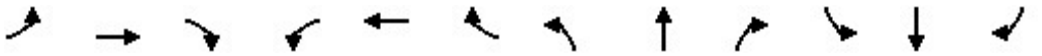
Intersection Summary				
Delay	25.2			
Level of Service	D			
Intersection Capacity Utilization	76.1%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	300	95	120	415	55	105	520	70	65	875	65
Future Volume (vph)	95	300	95	120	415	55	105	520	70	65	875	65
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	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	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.93
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	0.96		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1630	1637		1662	1710		1614	3228	1361	1630	3260	1358
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1630	1637		1662	1710		1614	3228	1361	1630	3260	1358
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	300	95	120	415	55	105	520	70	65	875	65
RTOR Reduction (vph)	0	12	0	0	5	0	0	0	48	0	0	46
Lane Group Flow (vph)	95	383	0	120	465	0	105	520	22	65	875	19
Confl. Peds. (#/hr)	34		30	30		34	22		17	17		22
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	7.7	32.0		9.4	33.7		9.1	31.6	31.6	7.0	29.5	29.5
Effective Green, g (s)	7.7	32.0		9.4	33.7		9.1	31.6	31.6	7.0	29.5	29.5
Actuated g/C Ratio	0.08	0.32		0.09	0.34		0.09	0.32	0.32	0.07	0.29	0.29
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	125	523		156	576		146	1020	430	114	961	400
v/s Ratio Prot	0.06	0.23		c0.07	c0.27		c0.07	0.16		0.04	c0.27	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.76	0.73		0.77	0.81		0.72	0.51	0.05	0.57	0.91	0.05
Uniform Delay, d1	45.2	30.2		44.2	30.2		44.2	27.9	23.8	45.0	34.0	25.2
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	21.3	8.8		18.3	11.6		13.2	1.8	0.2	4.2	14.1	0.2
Delay (s)	66.6	39.0		62.6	41.8		57.4	29.7	24.0	49.3	48.1	25.4
Level of Service	E	D		E	D		E	C	C	D	D	C
Approach Delay (s)		44.4			46.0			33.3			46.7	
Approach LOS		D			D			C			D	

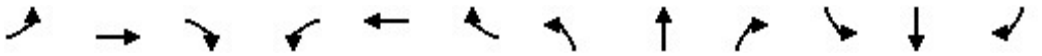
Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



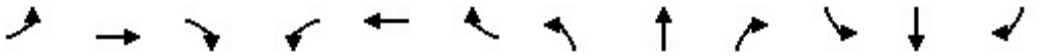
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	580	85	380	815	415	155	435	330	445	640	140
Future Volume (vph)	90	580	85	380	815	415	155	435	330	445	640	140
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	11	12	12	11	11	12	11	11	12	11	11
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		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	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1614	3061		3162	3151	1389	1646	3182	1407	3193	3182	1394
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1614	3061		3162	3151	1389	1646	3182	1407	3193	3182	1394
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	90	580	85	380	815	415	155	435	330	445	640	140
RTOR Reduction (vph)	0	9	0	0	0	114	0	0	57	0	0	58
Lane Group Flow (vph)	90	656	0	380	815	301	155	435	273	445	640	82
Confl. Peds. (#/hr)						8			5			12
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	3	8		7	4	5	1	6	7	5	2	3
Permitted Phases						4			6			2
Actuated Green, G (s)	13.6	31.7		20.0	38.1	59.7	16.0	36.7	56.7	21.6	42.3	55.9
Effective Green, g (s)	13.6	31.7		20.0	38.1	59.7	16.0	36.7	56.7	21.6	42.3	55.9
Actuated g/C Ratio	0.10	0.24		0.15	0.29	0.46	0.12	0.28	0.44	0.17	0.33	0.43
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	168	746		486	923	637	202	898	667	530	1035	653
v/s Ratio Prot	0.06	c0.21		0.12	c0.26	0.08	c0.09	0.14	0.06	c0.14	c0.20	0.01
v/s Ratio Perm						0.14			0.13			0.05
v/c Ratio	0.54	0.88		0.78	0.88	0.47	0.77	0.48	0.41	0.84	0.62	0.13
Uniform Delay, d1	55.2	47.3		52.9	43.8	24.3	55.2	38.8	25.2	52.5	37.0	22.3
Progression Factor	1.00	1.00		1.10	0.72	0.58	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	11.2		4.5	6.2	0.1	14.5	1.9	0.1	10.7	2.8	0.0
Delay (s)	56.8	58.5		62.9	37.9	14.3	69.7	40.7	25.3	63.3	39.8	22.4
Level of Service	E	E		E	D	B	E	D	C	E	D	C
Approach Delay (s)		58.3			37.7			40.0			46.3	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	44.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
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)	0	1100	255	585	1460	0	0	0	0	925	5	150
Future Volume (vph)	0	1100	255	585	1460	0	0	0	0	925	5	150
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	11	11	12	12	12	12	12	12	11
Total Lost time (s)		6.0		6.0	7.5					7.9	7.9	7.9
Lane Util. Factor		0.91		0.97	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.97		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4552		3027	3121					1548	1483	1339
Flt Permitted		1.00		0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4552		3027	3121					1548	1483	1339
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1100	255	585	1460	0	0	0	0	925	5	150
RTOR Reduction (vph)	0	29	0	0	0	0	0	0	0	0	1	60
Lane Group Flow (vph)	0	1326	0	585	1460	0	0	0	0	472	472	75
Confl. Peds. (#/hr)						4						
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	2%	2%	2%
Turn Type		NA		Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases												4
Actuated Green, G (s)		44.0		24.0	72.5					42.1	42.1	42.1
Effective Green, g (s)		44.0		24.0	72.5					42.1	42.1	42.1
Actuated g/C Ratio		0.34		0.18	0.56					0.32	0.32	0.32
Clearance Time (s)		6.0		6.0	7.5					7.9	7.9	7.9
Vehicle Extension (s)		2.0		2.5	2.5					4.0	4.0	4.0
Lane Grp Cap (vph)		1540		558	1740					501	480	433
v/s Ratio Prot		c0.29		c0.19	0.47					0.30	c0.32	
v/s Ratio Perm												0.06
v/c Ratio		0.86		1.05	0.84					0.94	0.98	0.17
Uniform Delay, d1		40.1		53.0	23.9					42.8	43.6	31.5
Progression Factor		0.99		1.02	0.82					1.00	1.00	1.00
Incremental Delay, d2		4.4		44.7	3.5					26.5	36.7	0.3
Delay (s)		43.9		98.8	23.1					69.3	80.4	31.8
Level of Service		D		F	C					E	F	C
Approach Delay (s)		43.9			44.7			0.0			69.4	
Approach LOS		D			D			A			E	

Intersection Summary			
HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
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)	0	1765	260	0	1890	1125	155	0	790	0	0	0
Future Volume (vph)	0	1765	260	0	1890	1125	155	0	790	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	12	12	12	12	15	16	12	12	12
Total Lost time (s)		5.9	5.9		5.9	4.0		5.9	4.0			
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00	1.00			
Frt		1.00	0.85		1.00	0.85		1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00		0.95	1.00			
Satd. Flow (prot)		3260	1458		3260	1458		1775	1637			
Flt Permitted		1.00	1.00		1.00	1.00		0.95	1.00			
Satd. Flow (perm)		3260	1458		3260	1458		1775	1637			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1765	260	0	1890	1125	155	0	790	0	0	0
RTOR Reduction (vph)	0	0	58	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1765	202	0	1890	1125	0	155	790	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	0%	0%	0%
Turn Type		NA	Perm		NA	Free	Split	NA	Free			
Protected Phases		2			6		8	8				
Permitted Phases			2			Free			Free			
Actuated Green, G (s)		101.2	101.2		101.2	130.0		17.0	130.0			
Effective Green, g (s)		101.2	101.2		101.2	130.0		17.0	130.0			
Actuated g/C Ratio		0.78	0.78		0.78	1.00		0.13	1.00			
Clearance Time (s)		5.9	5.9		5.9			5.9				
Vehicle Extension (s)		4.0	4.0		4.0			3.5				
Lane Grp Cap (vph)		2537	1134		2537	1458		232	1637			
v/s Ratio Prot		0.54			0.58			0.09				
v/s Ratio Perm			0.14			c0.77			0.48			
v/c Ratio		0.70	0.18		0.74	0.77		0.67	0.48			
Uniform Delay, d1		7.0	3.7		7.6	0.0		53.8	0.0			
Progression Factor		1.31	3.63		1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.6	0.1		2.0	4.0		7.4	1.0			
Delay (s)		9.8	13.6		9.6	4.0		61.2	1.0			
Level of Service		A	B		A	A		E	A			
Approach Delay (s)		10.3			7.5			10.9			0.0	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

LANE SUMMARY

Site: 23 [23-Des Moines Memorial Dr S @ EB SR 518 Ramps (Site Folder: 2032 PA Mit)]

Des Moines Memorial Dr S @ EB SR 518 Ramps
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Des Moines Memorial Dr S													
Lane 1[d]	550	2.0	1071	0.514	100	5.8	LOS A	3.5	89.0	Full	1600	0.0	0.0
Approach	550	2.0		0.514		5.8	LOS A	3.5	89.0				
North: Des Moines Memorial Dr S													
Lane 1[d]	965	3.0	1389	0.695	100	4.6	LOS A	0.0	0.0	Full	300	0.0	0.0
Approach	965	3.0		0.695		4.6	LOS A	0.0	0.0				
West: SR 518 EB Off Ramp													
Lane 1[d]	116	3.0	956	0.121	100	12.0	LOS B	0.7	18.9	Full	1600	0.0	0.0
Lane 2	45	3.0	1186	0.038	100	4.5	LOS A	0.2	4.7	Full	1600	0.0	0.0
Approach	161	3.0		0.121		9.9	LOS A	0.7	18.9				
Intersection	1676	2.7		0.695		5.5	LOS A	3.5	89.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Des Moines Memorial Dr S

Mov. From S To Exit:	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	160	390	550	2.0	1071	0.514	100	NA	NA
Approach	160	390	550	2.0		0.514			

North: Des Moines Memorial Dr S

Mov. From N To Exit:	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	300	665	965	3.0	1389	0.695	100	NA	NA
Approach	300	665	965	3.0		0.695			

West: SR 518 EB Off Ramp

Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.

LANE SUMMARY

Site: 24 [24-Des Moines Memorial Dr S @ WB SR 518 Ramps (Site Folder: 2032 PA Mit)]

Des Moines Memorial Dr S @ SR 518 WB Off Ramp
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Des Moines Memorial Dr S													
Lane 1[d]	275	2.0	1402	0.196	100	2.9	LOS A	0.0	0.0	Full	300	0.0	0.0
Approach	275	2.0		0.196		2.9	LOS A	0.0	0.0				
East: SR 518 WB Off Ramp													
Lane 1[d]	265	3.0	1414	0.187	100	4.1	LOS A	0.9	21.8	Short	225	0.0	NA
Lane 2	580	3.0	1414	0.410	100	1.3	LOS A	2.3	58.8	Full	1600	0.0	0.0
Approach	845	3.0		0.410		2.2	LOS A	2.3	58.8				
North: Des Moines Memorial Dr S													
Lane 1[d]	700	4.0	1140	0.614	100	5.1	LOS A	5.0	128.1	Full	1600	0.0	0.0
Approach	700	4.0		0.614		5.1	LOS A	5.0	128.1				
Intersection	1820	3.2		0.614		3.4	LOS A	5.0	128.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

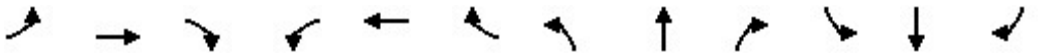
South: Des Moines Memorial Dr S

Mov. From S To Exit:	T1 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	275	275	2.0	1402	0.196	100	NA	NA
Approach	275	275	2.0		0.196			

East: SR 518 WB Off Ramp

Mov. From E To Exit:	L2 S	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	265	-	265	3.0	1414	0.187	100	0.0	2
Lane 2	-	580	580	3.0	1414	0.410	100	NA	NA
Approach	265	580	845	3.0		0.410			

North: Des Moines Memorial Dr S



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	15	20	0	45	20	475	20	95	550	0
Future Volume (Veh/h)	0	0	15	20	0	45	20	475	20	95	550	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	15	20	0	45	20	475	20	95	550	0
Pedestrians		2			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											1176	
pX, platoon unblocked												
vC, conflicting volume	1302	1278	552	1281	1268	486	552			496		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1302	1278	552	1281	1268	486	552			496		
tC, single (s)	8.1	7.5	7.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	4.4	4.9	4.2	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	84	100	92	98			91		
cM capacity (veh/h)	74	96	385	125	149	579	1001			1057		

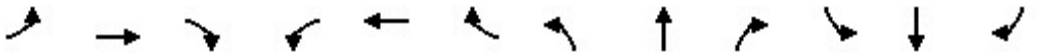
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	65	20	495	95	550
Volume Left	0	20	20	0	95	0
Volume Right	15	45	0	20	0	0
cSH	385	273	1001	1700	1057	1700
Volume to Capacity	0.04	0.24	0.02	0.29	0.09	0.32
Queue Length 95th (ft)	3	23	2	0	7	0
Control Delay (s)	14.7	22.3	8.7	0.0	8.7	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	14.7	22.3	0.3		1.3	
Approach LOS	B	C				

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	55.6%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	40	475	65	25	560
Future Volume (Veh/h)	70	40	475	65	25	560
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	40	475	65	25	560
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			751			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	1118	508			540	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1084	423			457	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	67	93			97	
cM capacity (veh/h)	215	580			997	

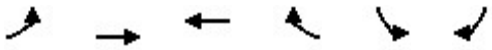
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	110	540	585
Volume Left	70	0	25
Volume Right	40	65	0
cSH	279	1700	997
Volume to Capacity	0.39	0.32	0.03
Queue Length 95th (ft)	45	0	2
Control Delay (s)	26.0	0.0	0.7
Lane LOS	D		A
Approach Delay (s)	26.0	0.0	0.7
Approach LOS	D		

Intersection Summary			
Average Delay		2.6	
Intersection Capacity Utilization		67.8%	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)	100	390	110	95	320	200	135	240	15	110	355	165
Future Volume (vph)	100	390	110	95	320	200	135	240	15	110	355	165
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0		11.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00		1.00	
Frt	1.00	0.97		1.00	0.94		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1581	1612		1614	1586		1516	1606	1334		2959	
Flt Permitted	0.29	1.00		0.32	1.00		0.39	1.00	1.00		0.83	
Satd. Flow (perm)	489	1612		539	1586		625	1606	1334		2478	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	390	110	95	320	200	135	240	15	110	355	165
RTOR Reduction (vph)	0	10	0	0	22	0	0	0	9	0	28	0
Lane Group Flow (vph)	100	490	0	95	498	0	135	240	6	0	602	0
Confl. Peds. (#/hr)	2					2	8		2	2		8
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	9%	9%	9%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	35.2	35.2		35.2	35.2		37.7	37.7	37.7		37.7	
Effective Green, g (s)	35.2	35.2		35.2	35.2		37.7	37.7	37.7		37.7	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.40	0.40	0.40		0.40	
Clearance Time (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0		11.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0		2.0	
Lane Grp Cap (vph)	181	597		199	588		248	638	529		984	
v/s Ratio Prot		0.30			c0.31			0.15				
v/s Ratio Perm	0.20			0.18			0.22		0.00		c0.24	
v/c Ratio	0.55	0.82		0.48	0.85		0.54	0.38	0.01		0.61	
Uniform Delay, d1	23.6	27.0		22.8	27.4		22.0	20.3	17.3		22.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.1	8.4		0.7	10.5		1.3	0.1	0.0		0.8	
Delay (s)	25.7	35.4		23.5	37.8		23.3	20.4	17.3		23.6	
Level of Service	C	D		C	D		C	C	B		C	
Approach Delay (s)		33.8			35.6			21.3			23.6	
Approach LOS		C			D			C			C	

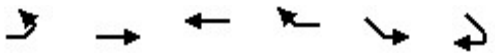
Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	94.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	125.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	515	465	0	230	150
Future Volume (Veh/h)	0	515	465	0	230	150
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	515	465	0	230	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		273				
pX, platoon unblocked					0.74	
vC, conflicting volume	465				980	465
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	465				800	465
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				13	75
cM capacity (veh/h)	1091				263	597

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	515	465	230	150
Volume Left	0	0	230	0
Volume Right	0	0	0	150
cSH	1700	1700	263	597
Volume to Capacity	0.30	0.27	0.87	0.25
Queue Length 95th (ft)	0	0	186	25
Control Delay (s)	0.0	0.0	69.0	13.0
Lane LOS			F	B
Approach Delay (s)	0.0	0.0	46.9	
Approach LOS			E	

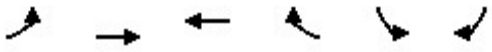
Intersection Summary			
Average Delay	13.1		
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	745	465	475	0	0
Future Volume (Veh/h)	0	745	465	475	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	745	465	475	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)		1187				
pX, platoon unblocked					0.81	
vC, conflicting volume	940				1448	702
vC1, stage 1 conf vol					702	
vC2, stage 2 conf vol					745	
vCu, unblocked vol	940				1435	702
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 %	100				100	100
cM capacity (veh/h)	729				350	441

Direction, Lane #	EB 1	WB 1
Volume Total	745	940
Volume Left	0	0
Volume Right	0	475
cSH	1700	1700
Volume to Capacity	0.44	0.55
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.0
Lane LOS		
Approach Delay (s)	0.0	0.0
Approach LOS		

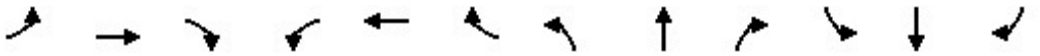
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	725	935	5	5	5
Future Volume (Veh/h)	20	725	935	5	5	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	725	935	5	5	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			1190			
pX, platoon unblocked	0.88				0.88	0.88
vC, conflicting volume	940				1702	938
vC1, stage 1 conf vol					938	
vC2, stage 2 conf vol					765	
vCu, unblocked vol	863				1730	860
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 %	97				98	98
cM capacity (veh/h)	678				288	315

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	745	940	10
Volume Left	20	0	5
Volume Right	0	5	5
cSH	678	1700	301
Volume to Capacity	0.03	0.55	0.03
Queue Length 95th (ft)	2	0	3
Control Delay (s)	0.8	0.0	17.4
Lane LOS	A		C
Approach Delay (s)	0.8	0.0	17.4
Approach LOS			C

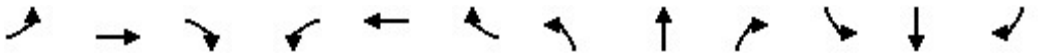
Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		68.9%	ICU Level of Service C
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	710	5	10	855	65	10	0	5	20	0	75
Future Volume (Veh/h)	15	710	5	10	855	65	10	0	5	20	0	75
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	710	5	10	855	65	10	0	5	20	0	75
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)					740							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	920			715			1692	1682	712	1652	1652	888
vC1, stage 1 conf vol							742	742		908	908	
vC2, stage 2 conf vol							950	940		745	745	
vCu, unblocked vol	843			715			1718	1707	712	1673	1673	806
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)							6.2	5.6		6.1	5.5	
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	98			99			94	100	99	92	100	78
cM capacity (veh/h)	696			881			181	240	413	248	266	340

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	15	715	10	920	15	95
Volume Left	15	0	10	0	10	20
Volume Right	0	5	0	65	5	75
cSH	696	1700	881	1700	222	315
Volume to Capacity	0.02	0.42	0.01	0.54	0.07	0.30
Queue Length 95th (ft)	2	0	1	0	5	31
Control Delay (s)	10.3	0.0	9.1	0.0	22.4	21.3
Lane LOS	B		A		C	C
Approach Delay (s)	0.2		0.1		22.4	21.3
Approach LOS					C	C

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	65.9%	ICU Level of Service		C
Analysis Period (min)	15			



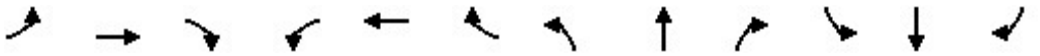
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	695	10	10	855	95	15	10	25	75	5	60
Future Volume (Veh/h)	30	695	10	10	855	95	15	10	25	75	5	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	695	10	10	855	95	15	10	25	75	5	60
Pedestrians		2			3			3			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)					236							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	953			708			1702	1736	706	1666	1646	860
vC1, stage 1 conf vol							763	763		878	878	
vC2, stage 2 conf vol							940	973		788	768	
vCu, unblocked vol	893			708			1725	1762	706	1684	1662	790
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 %	96			99			92	96	94	68	98	83
cM capacity (veh/h)	675			884			191	235	437	234	265	352

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	30	705	865	95	50	140
Volume Left	30	0	10	0	15	75
Volume Right	0	10	0	95	25	60
cSH	675	1700	884	1700	280	275
Volume to Capacity	0.04	0.41	0.01	0.06	0.18	0.51
Queue Length 95th (ft)	3	0	1	0	16	67
Control Delay (s)	10.6	0.0	0.3	0.0	20.6	31.0
Lane LOS	B		A		C	D
Approach Delay (s)	0.4		0.3		20.6	31.0
Approach LOS					C	D

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	79.6%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	795	0	0	755	205	200
Future Volume (vph)	795	0	0	755	205	200
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Width	12	12	11	11	11	16
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.99
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3189			3083	1502	1554
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3189			3083	1502	1554
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	795	0	0	755	205	200
RTOR Reduction (vph)	0	0	0	0	0	39
Lane Group Flow (vph)	795	0	0	755	205	161
Confl. Peds. (#/hr)		2	2			1
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	3%	3%	3%	3%	7%	7%
Bus Blockages (#/hr)	6	6	6	6	0	0
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	143.3			143.3	31.7	31.7
Effective Green, g (s)	143.3			143.3	31.7	31.7
Actuated g/C Ratio	0.73			0.73	0.16	0.16
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2343			2265	244	252
v/s Ratio Prot	c0.25			0.24	c0.14	
v/s Ratio Perm						0.10
v/c Ratio	0.34			0.33	0.84	0.64
Uniform Delay, d1	9.1			9.1	79.2	76.3
Progression Factor	1.00			1.49	1.00	1.00
Incremental Delay, d2	0.4			0.3	22.1	5.5
Delay (s)	9.5			13.8	101.3	81.8
Level of Service	A			B	F	F
Approach Delay (s)	9.5			13.8	91.7	
Approach LOS	A			B	F	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	195.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
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)	60	120	10	60	90	165	0	0	0	455	45	40
Future Volume (vph)	60	120	10	60	90	165	0	0	0	455	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		1.00			1.00	1.00					1.00	
Frpb, ped/bikes		1.00			1.00	0.99					1.00	
Flpb, ped/bikes		1.00			1.00	1.00					1.00	
Frt		0.99			1.00	0.85					0.99	
Flt Protected		0.98			0.98	1.00					0.96	
Satd. Flow (prot)		1687			1708	1475					1639	
Flt Permitted		0.86			0.83	1.00					0.96	
Satd. Flow (perm)		1472			1443	1475					1639	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	120	10	60	90	165	0	0	0	455	45	40
RTOR Reduction (vph)	0	0	0	0	0	41	0	0	0	0	0	0
Lane Group Flow (vph)	0	190	0	0	150	124	0	0	0	0	540	0
Confl. Peds. (#/hr)	5		9	9		5	22		7	7		22
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	pm+ov				Split	NA	
Protected Phases		4			8	6				6	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		13.5			13.5	44.7					31.2	
Effective Green, g (s)		13.5			13.5	44.7					31.2	
Actuated g/C Ratio		0.23			0.23	0.75					0.53	
Clearance Time (s)		4.0			4.0	4.0					4.0	
Vehicle Extension (s)		3.0			3.0	3.0					3.0	
Lane Grp Cap (vph)		334			327	1209					860	
v/s Ratio Prot						0.05					c0.33	
v/s Ratio Perm		c0.13			0.10	0.03						
v/c Ratio		0.57			0.46	0.10					0.63	
Uniform Delay, d1		20.4			19.8	2.0					10.0	
Progression Factor		1.00			1.00	1.00					1.00	
Incremental Delay, d2		2.2			1.0	0.0					1.4	
Delay (s)		22.6			20.8	2.0					11.4	
Level of Service		C			C	A					B	
Approach Delay (s)		22.6			11.0			0.0			11.4	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

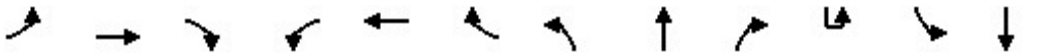
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	115	125	335	115	80	45	5	215	810	90	120	1015
Future Volume (vph)	115	125	335	115	80	45	5	215	810	90	120	1015
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		8.0	8.0		8.0	8.0		5.5	8.5	8.5	5.5	8.5
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00	1.00	0.82	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
Frt		1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.98	1.00		0.97	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1692	1432		1700	1457		1630	3260	1195	1630	3249
Flt Permitted		0.98	1.00		0.97	1.00		0.09	1.00	1.00	0.27	1.00
Satd. Flow (perm)		1692	1432		1700	1457		149	3260	1195	463	3249
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	115	125	335	115	80	45	5	215	810	90	120	1015
RTOR Reduction (vph)	0	0	281	0	0	38	0	0	0	54	0	1
Lane Group Flow (vph)	0	240	54	0	195	7	0	220	810	36	120	1034
Confl. Peds. (#/hr)			9			5				35		
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	3	3		4	4		5	5	2		1	6
Permitted Phases			3			4	2	2		2	6	
Actuated Green, G (s)		22.6	22.6		21.5	21.5		72.0	55.6	55.6	59.3	48.4
Effective Green, g (s)		22.6	22.6		21.5	21.5		72.0	55.6	55.6	59.3	48.4
Actuated g/C Ratio		0.16	0.16		0.15	0.15		0.51	0.40	0.40	0.42	0.34
Clearance Time (s)		8.0	8.0		8.0	8.0		5.5	8.5	8.5	5.5	8.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		271	230		259	222		266	1289	472	285	1118
v/s Ratio Prot		c0.14			c0.11			c0.11	0.25		0.03	c0.32
v/s Ratio Perm			0.04			0.00		0.32		0.03	0.14	
v/c Ratio		0.89	0.23		0.75	0.03		0.83	0.63	0.08	0.42	0.93
Uniform Delay, d1		57.7	51.5		57.0	50.7		37.5	34.2	26.5	25.9	44.4
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		27.2	0.5		11.7	0.1		18.6	1.0	0.1	1.0	12.6
Delay (s)		84.9	52.0		68.7	50.7		56.1	35.2	26.6	26.9	57.0
Level of Service		F	D		E	D		E	D	C	C	E
Approach Delay (s)		65.7			65.3				38.6			53.9
Approach LOS		E			E				D			D

Intersection Summary			
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.6	Sum of lost time (s)	30.0
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1750
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	20
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	2%
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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	215	425	355	240	325	150	290	750	55	5	155	1170
Future Volume (vph)	215	425	355	240	325	150	290	750	55	5	155	1170
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	11	11	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)	5.5	8.9	5.5	5.5	8.9		5.5	9.3	9.3		5.5	9.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.93		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	0.95		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1560	3121	1427	2941	2967		1630	3260	1360		1614	3228
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1560	3121	1427	2941	2967		1630	3260	1360		1614	3228
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	215	425	355	240	325	150	290	750	55	5	155	1170
RTOR Reduction (vph)	0	0	40	0	28	0	0	0	33	0	0	0
Lane Group Flow (vph)	215	425	315	240	447	0	290	750	22	0	160	1170
Confl. Peds. (#/hr)			6			6			33			
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	4	5!	3	8		5	2		1	1	6
Permitted Phases			4						2			
Actuated Green, G (s)	28.0	44.7	78.2	20.1	36.8		33.5	77.1	77.1		23.9	67.5
Effective Green, g (s)	28.0	44.7	78.2	20.1	36.8		33.5	77.1	77.1		23.9	67.5
Actuated g/C Ratio	0.14	0.23	0.40	0.10	0.19		0.17	0.40	0.40		0.12	0.35
Clearance Time (s)	5.5	8.9	5.5	5.5	8.9		5.5	9.3	9.3		5.5	9.3
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0		2.5	4.0	4.0		2.5	4.0
Lane Grp Cap (vph)	224	715	572	303	559		280	1288	537		197	1117
v/s Ratio Prot	c0.14	0.14	0.09	0.08	c0.15		c0.18	0.23			0.10	c0.36
v/s Ratio Perm			0.13						0.02			
v/c Ratio	0.96	0.59	0.55	0.79	0.80		1.04	0.58	0.04		0.81	1.05
Uniform Delay, d1	82.9	67.1	44.9	85.4	75.6		80.8	46.3	36.2		83.4	63.8
Progression Factor	0.99	0.98	0.74	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	46.6	1.3	0.9	12.8	7.8		63.4	1.9	0.1		21.4	40.2
Delay (s)	128.5	67.3	34.2	98.2	83.4		144.1	48.2	36.4		104.7	104.0
Level of Service	F	E	C	F	F		F	D	D		F	F
Approach Delay (s)		68.7			88.4			73.0				96.8
Approach LOS		E			F			E				F

Intersection Summary			
HCM 2000 Control Delay	82.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	195.0	Sum of lost time (s)	29.2
Intersection Capacity Utilization	108.6%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	140
Future Volume (vph)	140
Ideal Flow (vphpl)	1750
Lane Width	11
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1383
Flt Permitted	1.00
Satd. Flow (perm)	1383
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	140
RTOR Reduction (vph)	48
Lane Group Flow (vph)	92
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Actuated Green, G (s)	95.5
Effective Green, g (s)	95.5
Actuated g/C Ratio	0.49
Clearance Time (s)	5.5
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	677
v/s Ratio Prot	0.02
v/s Ratio Perm	0.05
v/c Ratio	0.14
Uniform Delay, d1	27.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	27.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

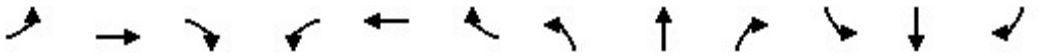
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	505	55	35	350	40	45
Future Volume (Veh/h)	505	55	35	350	40	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	505	55	35	350	40	45
Pedestrians				1	2	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1052					
pX, platoon unblocked						
vC, conflicting volume			562		780	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			562		780	283
tC, single (s)			4.4		7.3	7.4
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.6
p0 queue free %			96		85	93
cM capacity (veh/h)			932		276	645

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	337	223	152	233	85
Volume Left	0	0	35	0	40
Volume Right	0	55	0	0	45
cSH	1700	1700	932	1700	396
Volume to Capacity	0.20	0.13	0.04	0.14	0.21
Queue Length 95th (ft)	0	0	3	0	20
Control Delay (s)	0.0	0.0	2.4	0.0	16.6
Lane LOS			A		C
Approach Delay (s)	0.0		0.9		16.6
Approach LOS					C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	0	0	30	1090	280	5	460	1745
Future Volume (vph)	0	0	30	1090	280	5	460	1745
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	11	13	12	11	12
Total Lost time (s)			5.5	6.3	6.3		5.5	6.3
Lane Util. Factor			1.00	0.95	1.00		1.00	0.91
Frpb, ped/bikes			1.00	1.00	0.93		1.00	1.00
Flpb, ped/bikes			1.00	1.00	1.00		1.00	1.00
Frt			1.00	1.00	0.85		1.00	1.00
Flt Protected			0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)			1614	3121	1390		1576	4684
Flt Permitted			0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)			1614	3121	1390		1576	4684
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	30	1090	280	5	460	1745
RTOR Reduction (vph)	0	0	0	0	125	0	0	0
Lane Group Flow (vph)	0	0	30	1090	155	0	465	1745
Confl. Peds. (#/hr)					17			
Heavy Vehicles (%)	0%	0%	3%	3%	3%	2%	2%	2%
Turn Type			Prot	NA	Perm	Prot	Prot	NA
Protected Phases			5	2		1 8	1 8	6
Permitted Phases					2			
Actuated Green, G (s)			2.8	41.5	41.5		34.7	63.9
Effective Green, g (s)			2.8	41.5	41.5		29.7	63.9
Actuated g/C Ratio			0.03	0.47	0.47		0.34	0.73
Clearance Time (s)			5.5	6.3	6.3			6.3
Vehicle Extension (s)			2.5	4.0	4.0			4.0
Lane Grp Cap (vph)			51	1471	655		531	3401
v/s Ratio Prot			0.02	c0.35			c0.30	0.37
v/s Ratio Perm					0.11			
v/c Ratio			0.59	0.74	0.24		0.88	0.51
Uniform Delay, d1			42.0	18.9	13.8		27.4	5.3
Progression Factor			1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2			13.5	2.2	0.3		14.9	0.2
Delay (s)			55.6	21.1	14.1		42.3	5.4
Level of Service			E	C	B		D	A
Approach Delay (s)	0.0			20.4				13.2
Approach LOS	A			C				B

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	88.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	70.5%	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)	40	370	70	215	505	200	50	135	140	145	230	65
Future Volume (vph)	40	370	70	215	505	200	50	135	140	145	230	65
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	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	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		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	
Frt	1.00	0.98		1.00	0.96		1.00	0.92		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)	1599	1635		1646	1648		1642	1581		1646	1664	
Flt Permitted	0.22	1.00		0.32	1.00		0.42	1.00		0.23	1.00	
Satd. Flow (perm)	368	1635		557	1648		719	1581		394	1664	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	370	70	215	505	200	50	135	140	145	230	65
RTOR Reduction (vph)	0	4	0	0	7	0	0	30	0	0	7	0
Lane Group Flow (vph)	40	436	0	215	698	0	50	245	0	145	288	0
Confl. Peds. (#/hr)	1		2	2		1	3		1	1		3
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	68.2	63.0		83.1	72.9		34.3	27.9		46.9	35.5	
Effective Green, g (s)	68.2	63.0		83.1	72.9		34.3	27.9		46.9	35.5	
Actuated g/C Ratio	0.49	0.45		0.59	0.52		0.24	0.20		0.33	0.25	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	2.0	
Lane Grp Cap (vph)	224	735		448	858		218	315		257	421	
v/s Ratio Prot	0.01	0.27		c0.05	c0.42		0.01	c0.16		c0.06	c0.17	
v/s Ratio Perm	0.08			0.23			0.05			0.13		
v/c Ratio	0.18	0.59		0.48	0.81		0.23	0.78		0.56	0.68	
Uniform Delay, d1	21.9	28.9		16.2	27.9		41.4	53.1		35.6	47.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.5		0.3	8.3		0.2	11.5		1.7	3.6	
Delay (s)	22.1	32.4		16.5	36.2		41.6	64.6		37.3	50.8	
Level of Service	C	C		B	D		D	E		D	D	
Approach Delay (s)		31.5			31.6			61.1			46.4	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	640	305	220	80
Future Volume (Veh/h)	0	0	640	305	220	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	640	305	220	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	1845	260	300			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1845	260	300			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	49			
cM capacity (veh/h)	41	784	1267			

Direction, Lane #	NB 1	SB 1
Volume Total	945	300
Volume Left	640	0
Volume Right	0	80
cSH	1267	1700
Volume to Capacity	0.51	0.18
Queue Length 95th (ft)	74	0
Control Delay (s)	9.4	0.0
Lane LOS	A	
Approach Delay (s)	9.4	0.0
Approach LOS		

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	715	0	885	220	0
Future Volume (Veh/h)	60	715	0	885	220	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	715	0	885	220	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		5				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1105	220	220			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1105	220	220			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	13	100			
cM capacity (veh/h)	234	822	1355			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	775	885	220
Volume Left	60	0	0
Volume Right	715	0	0
cSH	891	1700	1700
Volume to Capacity	0.87	0.52	0.13
Queue Length 95th (ft)	282	0	0
Control Delay (s)	30.4	0.0	0.0
Lane LOS	D		
Approach Delay (s)	30.4	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	12.5		
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL	SBR	SBR2	SEL	SER
Lane Configurations											
Traffic Volume (vph)	25	60	1640	720	850	250	155	25	20	0	0
Future Volume (vph)	25	60	1640	720	850	250	155	25	20	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor		1.00	0.91	0.95	0.95	1.00	1.00	1.00			
Frpb, ped/bikes		1.00	1.00	1.00	1.00	0.97	1.00	1.00			
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Frt		1.00	1.00	0.98	0.85	0.85	1.00	0.85			
Flt Protected		0.95	1.00	1.00	1.00	1.00	0.95	1.00			
Satd. Flow (prot)		1630	4684	1595	1385	1414	1630	1458			
Flt Permitted		0.95	1.00	1.00	1.00	1.00	0.95	1.00			
Satd. Flow (perm)		1630	4684	1595	1385	1414	1630	1458			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	60	1640	720	850	250	155	25	20	0	0
RTOR Reduction (vph)	0	0	0	0	0	34	0	39	0	0	0
Lane Group Flow (vph)	0	85	1640	839	731	216	155	6	0	0	0
Confl. Peds. (#/hr)		5				5					
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%
Turn Type	Prot	Prot	NA	NA	Perm	Perm	Prot	Perm			
Protected Phases	7	7	4	8			1				
Permitted Phases					8	8		1			
Actuated Green, G (s)		9.3	76.2	61.9	61.9	61.9	13.8	13.8			
Effective Green, g (s)		9.3	76.2	61.9	61.9	61.9	13.8	13.8			
Actuated g/C Ratio		0.09	0.76	0.62	0.62	0.62	0.14	0.14			
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)		3.0	4.0	4.0	4.0	4.0	2.0	2.0			
Lane Grp Cap (vph)		151	3569	987	857	875	224	201			
v/s Ratio Prot		0.05	c0.35	0.53			c0.10				
v/s Ratio Perm					c0.53	0.15		0.00			
v/c Ratio		0.56	0.46	0.85	0.85	0.25	0.69	0.03			
Uniform Delay, d1		43.4	4.4	15.3	15.4	8.6	41.1	37.3			
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		4.7	0.4	9.1	10.5	0.7	7.2	0.0			
Delay (s)		48.1	4.8	24.4	25.9	9.2	48.3	37.3			
Level of Service		D	A	C	C	A	D	D			
Approach Delay (s)			6.9	22.9			45.8			0.0	
Approach LOS			A	C			D			A	

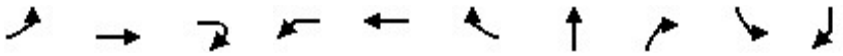
Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	885	755	40	775
Future Volume (Veh/h)	0	0	885	755	40	775
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	885	755	40	775
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1052			
pX, platoon unblocked						
vC, conflicting volume	1740	885			885	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1740	885			885	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			95	
cM capacity (veh/h)	92	347			769	

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	885	755	40	775
Volume Left	0	0	40	0
Volume Right	0	755	0	0
cSH	1700	1700	769	1700
Volume to Capacity	0.52	0.44	0.05	0.46
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.0	0.0	9.9	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.5	
Approach LOS				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NBT	NBR	SBL	SBR
Lane Configurations										
Traffic Volume (vph)	130	105	150	175	0	110	605	160	50	800
Future Volume (vph)	130	105	150	175	0	110	605	160	50	800
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	14	12	16	11	12	12	11	12	11	12
Total Lost time (s)		5.0	4.0	5.0	5.0		5.0		5.0	4.0
Lane Util. Factor		1.00	1.00	0.95	0.95		0.91		1.00	0.88
Frpb, ped/bikes		1.00	0.99	1.00	1.00		1.00		1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.88		0.97		1.00	1.00
Flt Protected		0.97	1.00	0.95	0.99		1.00		0.95	1.00
Satd. Flow (prot)		1686	1649	1527	1447		4429		1591	3011
Flt Permitted		0.97	1.00	0.95	0.95		1.00		0.95	1.00
Satd. Flow (perm)		1686	1649	1527	1395		4429		1591	3011
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	105	150	175	0	110	605	160	50	800
RTOR Reduction (vph)	0	0	0	0	77	0	40	0	0	0
Lane Group Flow (vph)	0	235	150	149	59	0	725	0	50	800
Confl. Peds. (#/hr)			1							1
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%
Turn Type	Split	NA	Free	Prot	NA		NA		Prot	Perm
Protected Phases	4!	4		3	8!		2		1	
Permitted Phases			Free							6
Actuated Green, G (s)		19.2	100.0	17.3	41.5		36.0		7.5	48.5
Effective Green, g (s)		19.2	100.0	17.3	41.5		36.0		7.5	49.5
Actuated g/C Ratio		0.19	1.00	0.17	0.42		0.36		0.08	0.50
Clearance Time (s)		5.0		5.0	5.0		5.0		5.0	5.0
Vehicle Extension (s)		3.0		3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)		323	1649	264	587		1594		119	1490
v/s Ratio Prot		c0.14		c0.10	0.02		0.16		0.03	
v/s Ratio Perm			0.09		0.02					c0.27
v/c Ratio		0.73	0.09	0.56	0.10		0.46		0.42	0.54
Uniform Delay, d1		37.9	0.0	37.9	17.9		24.5		44.2	17.4
Progression Factor		1.00	1.00	1.00	1.00		0.97		1.00	1.00
Incremental Delay, d2		7.9	0.1	2.8	0.1		0.7		2.4	1.4
Delay (s)		45.9	0.1	40.6	17.9		24.5		46.6	18.8
Level of Service		D	A	D	B		C		D	B
Approach Delay (s)		28.0			29.8		24.5			
Approach LOS		C			C		C			

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBR	EBR2	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations									
Traffic Volume (vph)	245	105	425	1220	515	0	0	0	0
Future Volume (vph)	245	105	425	1220	515	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	10	12	12	11	11	12	12	12	12
Total Lost time (s)	5.0		5.0	5.0	5.0				
Lane Util. Factor	1.00		0.95	0.86	0.86				
Frt	0.94		0.85	1.00	1.00				
Flt Protected	0.97		1.00	0.95	0.97				
Satd. Flow (prot)	1463		1385	1368	4207				
Flt Permitted	0.97		1.00	0.95	0.97				
Satd. Flow (perm)	1463		1385	1368	4207				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	105	425	1220	515	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	401	0	374	610	1125	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	0%	0%	0%	0%
Turn Type	Prot		custom	Split	NA				
Protected Phases	4		2 4	2	2				
Permitted Phases									
Actuated Green, G (s)	25.0		86.4	56.4	56.4				
Effective Green, g (s)	25.0		86.4	56.4	56.4				
Actuated g/C Ratio	0.25		0.86	0.56	0.56				
Clearance Time (s)	5.0			5.0	5.0				
Vehicle Extension (s)	3.0			3.0	3.0				
Lane Grp Cap (vph)	365		1196	771	2372				
v/s Ratio Prot	c0.27		0.27	c0.45	0.27				
v/s Ratio Perm									
v/c Ratio	1.10		0.31	0.79	0.47				
Uniform Delay, d1	37.5		1.3	17.2	13.0				
Progression Factor	1.00		1.00	1.00	1.00				
Incremental Delay, d2	76.3		0.2	8.1	0.7				
Delay (s)	113.8		1.4	25.3	13.7				
Level of Service	F		A	C	B				
Approach Delay (s)	59.6				17.8	0.0		0.0	
Approach LOS	E				B	A		A	

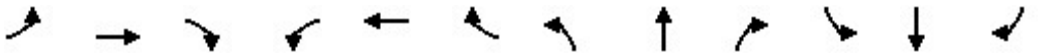
Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	355	0	0	425	0
Future Volume (Veh/h)	0	355	0	0	425	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	355	0	0	425	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)				411	273	
pX, platoon unblocked						
vC, conflicting volume	425	425	425			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	425	425	425			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	44	100			
cM capacity (veh/h)	586	629	1145			

Direction, Lane #	EB 1	SB 1
Volume Total	355	425
Volume Left	0	0
Volume Right	355	0
cSH	629	1700
Volume to Capacity	0.56	0.25
Queue Length 95th (ft)	88	0
Control Delay (s)	17.9	0.0
Lane LOS	C	
Approach Delay (s)	17.9	0.0
Approach LOS	C	

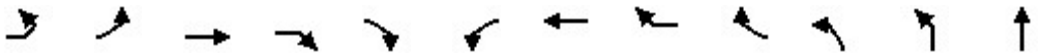
Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	180	65	170	290	45	70	340	150	35	600	235
Future Volume (vph)	170	180	65	170	290	45	70	340	150	35	600	235
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	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
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1589		1568	1612		1630	1619		1630	1716	1418
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1583	1589		1568	1612		1630	1619		1630	1716	1418
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	170	180	65	170	290	45	70	340	150	35	600	235
RTOR Reduction (vph)	0	12	0	0	5	0	0	14	0	0	0	146
Lane Group Flow (vph)	170	233	0	170	330	0	70	476	0	35	600	89
Confl. Peds. (#/hr)	3		3	3		3	4		8	8		4
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												8
Actuated Green, G (s)	13.9	23.6		14.0	23.7		5.2	40.0		3.8	38.6	38.6
Effective Green, g (s)	13.9	23.6		14.0	23.7		5.2	40.0		3.8	38.6	38.6
Actuated g/C Ratio	0.14	0.23		0.14	0.23		0.05	0.39		0.04	0.38	0.38
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)	216	369		216	376		83	638		61	653	539
v/s Ratio Prot	0.11	0.15		c0.11	c0.20		c0.04	0.29		0.02	c0.35	
v/s Ratio Perm												0.06
v/c Ratio	0.79	0.63		0.79	0.88		0.84	0.75		0.57	0.92	0.17
Uniform Delay, d1	42.3	35.0		42.3	37.4		47.7	26.3		48.0	29.9	20.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.9	2.6		15.9	19.3		50.6	4.2		12.4	17.6	0.1
Delay (s)	58.2	37.6		58.1	56.8		98.3	30.5		60.4	47.5	20.8
Level of Service	E	D		E	E		F	C		E	D	C
Approach Delay (s)		46.0			57.2			39.0			40.8	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	101.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL2	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	5	125	330	30	175	235	505	50	145	170	100	515
Future Volume (vph)	5	125	330	30	175	235	505	50	145	170	100	515
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	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor		1.00	0.95			1.00	0.91		0.91	0.91	0.95	0.95
Frpb, ped/bikes		1.00	0.99			1.00	1.00		0.97	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00
Frt		1.00	0.94			1.00	0.98		0.85	1.00	1.00	0.96
Flt Protected		0.95	1.00			0.95	1.00		1.00	0.95	0.95	1.00
Satd. Flow (prot)		1646	3076			1630	3055		1287	1498	1564	3124
Flt Permitted		0.95	1.00			0.95	1.00		1.00	0.95	0.95	1.00
Satd. Flow (perm)		1646	3076			1630	3055		1287	1498	1564	3124
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	125	330	30	175	235	505	50	145	170	100	515
RTOR Reduction (vph)	0	0	47	0	0	0	2	0	98	0	0	0
Lane Group Flow (vph)	0	130	488	0	0	235	568	0	32	134	136	710
Confl. Peds. (#/hr)				6	1			7	12			
Confl. Bikes (#/hr)				1	1							
Heavy Vehicles (%)	1%	1%	1%	1%	1%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	Prot	NA			Prot	NA		Perm	Prot	Prot	NA
Protected Phases	3	3	8			7	4			1	1	6
Permitted Phases									4			
Actuated Green, G (s)		13.7	24.3			21.5	32.1		32.1	17.6	17.6	44.1
Effective Green, g (s)		13.7	24.3			21.5	32.1		32.1	17.6	17.6	44.1
Actuated g/C Ratio		0.11	0.19			0.17	0.25		0.25	0.14	0.14	0.34
Clearance Time (s)		5.0	5.0			5.0	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	2.0			2.0	2.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		173	574			269	754		317	202	211	1059
v/s Ratio Prot		0.08	c0.16			c0.14	0.19			0.09	0.09	c0.23
v/s Ratio Perm									0.02			
v/c Ratio		0.75	0.85			0.87	0.75		0.10	0.66	0.64	0.67
Uniform Delay, d1		56.5	51.1			52.9	45.3		37.8	53.4	53.2	36.7
Progression Factor		1.00	1.00			0.85	1.00		3.03	1.00	1.00	1.00
Incremental Delay, d2		16.7	10.9			23.0	3.5		0.0	6.2	5.0	3.4
Delay (s)		73.2	62.0			67.7	48.9		114.7	59.6	58.2	40.1
Level of Service		E	E			E	D		F	E	E	D
Approach Delay (s)			64.2				62.8					45.3
Approach LOS			E				E					D

Intersection Summary			
HCM 2000 Control Delay	56.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	SER2	NWR2
Lane Configurations									
Traffic Volume (vph)	185	10	365	60	700	80	10	0	0
Future Volume (vph)	185	10	365	60	700	80	10	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)			5.0	5.0	5.0				
Lane Util. Factor			0.91	0.95	0.95				
Frpb, ped/bikes			1.00	1.00	0.99				
Flpb, ped/bikes			1.00	1.00	1.00				
Frt			1.00	1.00	0.98				
Flt Protected			0.95	0.95	1.00				
Satd. Flow (prot)			1498	1564	3218				
Flt Permitted			0.95	0.95	1.00				
Satd. Flow (perm)			1498	1564	3218				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	10	365	60	700	80	10	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	212	213	790	0	0	0	0
Confl. Peds. (#/hr)	4	6				7	7	7	6
Confl. Bikes (#/hr)									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	10%	0%
Turn Type			Prot	Prot	NA			Perm	Perm
Protected Phases			5	5	2				
Permitted Phases								4	8
Actuated Green, G (s)			20.1	20.1	46.6				
Effective Green, g (s)			20.1	20.1	46.6				
Actuated g/C Ratio			0.15	0.15	0.36				
Clearance Time (s)			5.0	5.0	5.0				
Vehicle Extension (s)			2.0	2.0	2.0				
Lane Grp Cap (vph)			231	241	1153				
v/s Ratio Prot			c0.14	0.14	c0.25				
v/s Ratio Perm									
v/c Ratio			0.92	0.88	0.69				
Uniform Delay, d1			54.1	53.8	35.5				
Progression Factor			1.00	1.00	1.00				
Incremental Delay, d2			36.6	28.7	3.3				
Delay (s)			90.8	82.5	38.8				
Level of Service			F	F	D				
Approach Delay (s)					55.5				
Approach LOS					E				

Intersection Summary

LANE SUMMARY

Site: 50 [50-SW 160th St @ SR 509 SB Ramps (Site Folder: 2032 PA)]

SW 160th St @ SR 509 SB Ramps 2032 Proposed Action
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: SW 160th Street (WB)													
Lane 1[d]	620	1.0	1416	0.438	100	5.2	LOS A	0.0	0.0	Full	750	0.0	0.0
Approach	620	1.0		0.438		5.2	LOS A	0.0	0.0				
North: SR 509 SB Off Ramp													
Lane 1[d]	210	1.0	1164	0.180	100	12.1	LOS B	1.0	26.3	Full	1600	0.0	0.0
Lane 2	600	1.0	1658	0.362	100	3.9	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	810	1.0		0.362		6.0	LOS A	1.0	26.3				
West: SW 160th Street (EB)													
Lane 1[d]	655	1.0	1335	0.491	100	5.8	LOS A	3.7	94.1	Full	350	0.0	0.0
Lane 2	375	1.0	1658	0.226	100	3.8	LOS A	0.0	0.0	Full	350	0.0	0.0
Approach	1030	1.0		0.491		5.1	LOS A	3.7	94.1				
Intersection	2460	1.0		0.491		5.4	LOS A	3.7	94.1				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

East: SW 160th Street (WB)

Mov. From E To Exit:	L2 S	T1 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	120	500	620	1.0	1416	0.438	100	NA	NA
Approach	120	500	620	1.0		0.438			

North: SR 509 SB Off Ramp

Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	210	-	210	1.0	1164	0.180	100	NA	NA
Lane 2	-	600	600	1.0	1658	0.362	100	NA	NA
Approach	210	600	810	1.0		0.362			

LANE SUMMARY

Site: 51 [51-S 160th Street @ 5th Pl S (Site Folder: 2032 PA)]

51-S 160th St @ 5th Pl S, 2032 Proposed Action
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 509 NB Ramps													
Lane 1[d]	385	1.0	1090	0.353	100	10.5	LOS B	2.1	52.4	Full	1600	0.0	0.0
Approach	385	1.0		0.353		10.5	LOS B	2.1	52.4				
East: SW 160th Street (WB)													
Lane 1[d]	335	1.0	1081	0.310	100	6.3	LOS A	1.9	47.2	Full	710	0.0	0.0
Approach	335	1.0		0.310		6.3	LOS A	1.9	47.2				
North: 5th Place S (SB)													
Lane 1[d]	21	0.0	914	0.023	100	8.0	LOS A	0.1	3.0	Full	1600	0.0	0.0
Approach	21	0.0		0.023		8.0	LOS A	0.1	3.0				
West: SW 160th Street (EB)													
Lane 1[d]	865	1.0	1378	0.628	100	4.5	LOS A	6.4	160.8	Full	750	0.0	0.0
Approach	865	1.0		0.628		4.5	LOS A	6.4	160.8				
Intersection	1606	1.0		0.628		6.4	LOS A	6.4	160.8				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

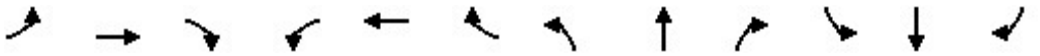
South: SR 509 NB Ramps

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	325	10	50	385	1.0	1090	0.353	100	NA	NA
Approach	325	10	50	385	1.0		0.353			

East: SW 160th Street (WB)

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	280	30	335	1.0	1081	0.310	100	NA	NA
Approach	25	280	30	335	1.0		0.310			

North: 5th Place S (SB)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	20	160	5	5	5	50	315	5	5	545	280
Future Volume (vph)	225	20	160	5	5	5	50	315	5	5	545	280
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	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	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	1458		1330	1295		1613	1694		1601	1600	
Flt Permitted	0.75	1.00		0.62	1.00		0.20	1.00		0.56	1.00	
Satd. Flow (perm)	1264	1458		873	1295		342	1694		939	1600	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	225	20	160	5	5	5	50	315	5	5	545	280
RTOR Reduction (vph)	0	121	0	0	4	0	0	0	0	0	18	0
Lane Group Flow (vph)	225	59	0	5	6	0	50	320	0	5	807	0
Confl. Peds. (#/hr)							2		7	7		2
Heavy Vehicles (%)	4%	4%	4%	25%	25%	25%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	16.1	16.1		16.1	16.1		39.5	39.5		39.5	39.5	
Effective Green, g (s)	16.1	16.1		16.1	16.1		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.60	0.60		0.60	0.60	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	310	357		214	317		205	1020		565	963	
v/s Ratio Prot		0.04			0.00			0.19			c0.50	
v/s Ratio Perm	c0.18			0.01			0.15			0.01		
v/c Ratio	0.73	0.17		0.02	0.02		0.24	0.31		0.01	0.84	
Uniform Delay, d1	22.7	19.5		18.8	18.8		6.1	6.4		5.2	10.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.0	0.1		0.0	0.0		0.2	0.1		0.0	6.2	
Delay (s)	29.7	19.5		18.8	18.8		6.3	6.5		5.2	16.6	
Level of Service	C	B		B	B		A	A		A	B	
Approach Delay (s)		25.2			18.8			6.4			16.6	
Approach LOS		C			B			A			B	

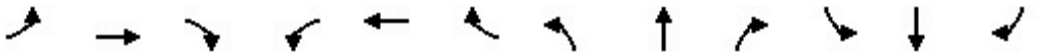
Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	65.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	55	465	180	110	300	165
Future Volume (vph)	55	465	180	110	300	165
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	465	180	110	300	165

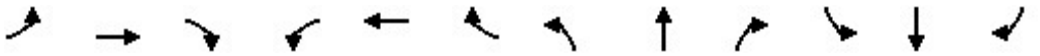
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	55	465	290	300	165
Volume Left (vph)	55	0	0	300	0
Volume Right (vph)	0	465	110	0	0
Hadj (s)	0.46	-0.34	0.10	0.69	0.19
Departure Headway (s)	6.0	3.2	4.8	5.6	5.1
Degree Utilization, x	0.09	0.41	0.38	0.47	0.23
Capacity (veh/h)	539	1115	738	632	693
Control Delay (s)	9.7	8.4	10.7	12.2	8.4
Approach Delay (s)	8.6		10.7	10.9	
Approach LOS	A		B	B	

Intersection Summary			
Delay	9.9		
Level of Service	A		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		



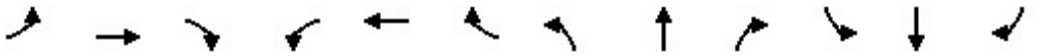
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	320	10	35	405	230	115	20	40	0	0	0
Future Volume (vph)	80	320	10	35	405	230	115	20	40	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00				
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99				
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00				
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.90				
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1511	3007		1523	1606	1365	1583	1487				
Flt Permitted	0.52	1.00		0.55	1.00	1.00	0.95	1.00				
Satd. Flow (perm)	834	3007		886	1606	1365	1583	1487				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	320	10	35	405	230	115	20	40	0	0	0
RTOR Reduction (vph)	0	3	0	0	0	97	0	33	0	0	0	0
Lane Group Flow (vph)	80	327	0	35	405	133	115	27	0	0	0	0
Confl. Peds. (#/hr)			2	2								
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	10%	10%	10%	9%	9%	9%	5%	5%	5%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Split	NA				
Protected Phases		4			8		2	2				
Permitted Phases	4			8		8						
Actuated Green, G (s)	23.0	23.0		23.0	23.0	23.0	6.9	6.9				
Effective Green, g (s)	23.0	23.0		23.0	23.0	23.0	6.9	6.9				
Actuated g/C Ratio	0.58	0.58		0.58	0.58	0.58	0.17	0.17				
Clearance Time (s)	5.0	5.0		5.0	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				
Lane Grp Cap (vph)	480	1733		510	925	786	273	257				
v/s Ratio Prot		0.11			c0.25		c0.07	0.02				
v/s Ratio Perm	0.10			0.04		0.10						
v/c Ratio	0.17	0.19		0.07	0.44	0.17	0.42	0.10				
Uniform Delay, d1	4.0	4.0		3.7	4.8	4.0	14.7	13.9				
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	0.2	0.1		0.1	0.3	0.1	1.1	0.2				
Delay (s)	4.1	4.1		3.8	5.1	4.1	15.8	14.1				
Level of Service	A	A		A	A	A	B	B				
Approach Delay (s)		4.1			4.7			15.2			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	39.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
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)	30	330	0	0	630	60	0	0	0	75	5	40
Future Volume (vph)	30	330	0	0	630	60	0	0	0	75	5	40
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						5.0	
Lane Util. Factor	1.00	0.95			0.95						1.00	
Frpb, ped/bikes	1.00	1.00			1.00						1.00	
Flpb, ped/bikes	1.00	1.00			1.00						1.00	
Frt	1.00	1.00			0.99						0.95	
Flt Protected	0.95	1.00			1.00						0.97	
Satd. Flow (prot)	1539	3079			3119						1367	
Flt Permitted	0.33	1.00			1.00						0.95	
Satd. Flow (perm)	528	3079			3119						1339	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	330	0	0	630	60	0	0	0	75	5	40
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	25	0
Lane Group Flow (vph)	30	330	0	0	685	0	0	0	0	0	95	0
Confl. Peds. (#/hr)			7			2	3					3
Heavy Vehicles (%)	8%	8%	8%	5%	5%	5%	0%	0%	0%	18%	18%	18%
Bus Blockages (#/hr)	0	0	44	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm			Perm	NA	
Protected Phases	3	8		7	4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	48.2	48.2			40.1						11.1	
Effective Green, g (s)	48.2	48.2			40.1						11.1	
Actuated g/C Ratio	0.70	0.70			0.58						0.16	
Clearance Time (s)	5.0	5.0			5.0						5.0	
Vehicle Extension (s)	5.0	5.0			5.0						5.0	
Lane Grp Cap (vph)	412	2141			1804						214	
v/s Ratio Prot	0.00	c0.11			c0.22							
v/s Ratio Perm	0.05										c0.07	
v/c Ratio	0.07	0.15			0.38						0.44	
Uniform Delay, d1	3.7	3.6			7.9						26.3	
Progression Factor	1.00	1.00			1.00						1.00	
Incremental Delay, d2	0.2	0.2			0.6						3.0	
Delay (s)	3.8	3.8			8.5						29.3	
Level of Service	A	A			A						C	
Approach Delay (s)		3.8			8.5			0.0			29.3	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	69.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
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 (veh/h)	55	340	10	25	480	90	20	0	15	115	0	190
Future Volume (Veh/h)	55	340	10	25	480	90	20	0	15	115	0	190
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	340	10	25	480	90	20	0	15	115	0	190
Pedestrians		1			2						6	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						1	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		502			393							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	486			350			986	991	177	833	996	487
vC1, stage 1 conf vol							455	455		536	536	
vC2, stage 2 conf vol							531	536		297	460	
vCu, unblocked vol	345			350			915	920	177	740	926	346
tC, single (s)	4.2			4.2			7.7	6.7	7.1	7.5	6.5	6.9
tC, 2 stage (s)							6.7	5.7		6.5	5.5	
tF (s)	2.2			2.3			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	95			98			92	100	98	74	100	67
cM capacity (veh/h)	1051			1170			253	373	807	442	407	572

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	55	227	123	25	480	90	35	115	190
Volume Left	55	0	0	25	0	0	20	115	0
Volume Right	0	0	10	0	0	90	15	0	190
cSH	1051	1700	1700	1170	1700	1700	358	442	572
Volume to Capacity	0.05	0.13	0.07	0.02	0.28	0.05	0.10	0.26	0.33
Queue Length 95th (ft)	4	0	0	2	0	0	8	26	36
Control Delay (s)	8.6	0.0	0.0	8.1	0.0	0.0	16.1	16.0	14.4
Lane LOS	A			A			C	C	B
Approach Delay (s)	1.2			0.3			16.1	15.0	
Approach LOS							C	B	

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	53.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	45	305	120	100	270	280	25	140	925	100	50	345
Future Volume (vph)	45	305	120	100	270	280	25	140	925	100	50	345
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	12.0	12.0	7.0	12.0	12.0		5.0	10.0			5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.97	0.91			0.97
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99		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
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1614	1699	1414	1599	1683	1411		3072	4469			3131
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1614	1699	1414	1599	1683	1411		3072	4469			3131
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	305	120	100	270	280	25	140	925	100	50	345
RTOR Reduction (vph)	0	0	92	0	0	211	0	0	9	0	0	0
Lane Group Flow (vph)	45	305	28	100	270	69	0	165	1016	0	0	395
Confl. Peds. (#/hr)			8			1				11		
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	5%	5%	5%	5%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases			4			8						
Actuated Green, G (s)	8.7	32.1	32.1	10.9	34.3	34.3		12.4	42.2			20.8
Effective Green, g (s)	8.7	32.1	32.1	10.9	34.3	34.3		12.4	42.2			20.8
Actuated g/C Ratio	0.06	0.23	0.23	0.08	0.24	0.24		0.09	0.30			0.15
Clearance Time (s)	7.0	12.0	12.0	7.0	12.0	12.0		5.0	10.0			5.0
Vehicle Extension (s)	4.0	4.0	4.0	3.0	2.0	2.0		2.5	3.0			3.0
Lane Grp Cap (vph)	100	389	324	124	412	345		272	1347			465
v/s Ratio Prot	0.03	c0.18		c0.06	0.16			0.05	c0.23			c0.13
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.45	0.78	0.08	0.81	0.66	0.20		0.61	0.75			0.85
Uniform Delay, d1	63.3	50.7	42.4	63.5	47.5	41.9		61.5	44.2			58.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2	4.3	10.5	0.2	30.5	2.9	0.1		3.2	4.0			13.5
Delay (s)	67.7	61.2	42.6	94.0	50.4	42.0		64.7	48.2			71.6
Level of Service	E	E	D	F	D	D		E	D			E
Approach Delay (s)		57.1			53.5				50.5			
Approach LOS		E			D				D			

Intersection Summary			
HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	34.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	790	185
Future Volume (vph)	790	185
Ideal Flow (vphpl)	1750	1750
Total Lost time (s)	10.0	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	1.00	
Satd. Flow (prot)	4491	
Flt Permitted	1.00	
Satd. Flow (perm)	4491	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	790	185
RTOR Reduction (vph)	26	0
Lane Group Flow (vph)	949	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	3%	3%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	50.6	
Effective Green, g (s)	50.6	
Actuated g/C Ratio	0.36	
Clearance Time (s)	10.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1623	
v/s Ratio Prot	0.21	
v/s Ratio Perm		
v/c Ratio	0.59	
Uniform Delay, d1	36.2	
Progression Factor	1.00	
Incremental Delay, d2	1.6	
Delay (s)	37.7	
Level of Service	D	
Approach Delay (s)	47.5	
Approach LOS	D	

Intersection Summary

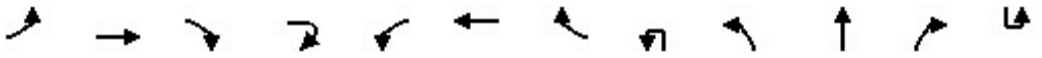
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Right Turn Channelized						
Traffic Volume (veh/h)	35	20	20	185	330	35
Future Volume (veh/h)	35	20	20	185	330	35
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	20	20	185	330	35
Approach Volume (veh/h)	55			205	365	
Crossing Volume (veh/h)	330			35	20	
High Capacity (veh/h)	1069			1347	1363	
High v/c (veh/h)	0.05			0.15	0.27	
Low Capacity (veh/h)	875			1127	1142	
Low v/c (veh/h)	0.06			0.18	0.32	

Intersection Summary			
Maximum v/c High	0.27		
Maximum v/c Low	0.32		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	85	0	0	390	0	200
Future Volume (Veh/h)	85	0	0	390	0	200
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	85	0	0	390	0	200
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)				424		
pX, platoon unblocked					0.96	
vC, conflicting volume			85		475	85
vC1, stage 1 conf vol					85	
vC2, stage 2 conf vol					390	
vCu, unblocked vol			85		437	85
tC, single (s)			4.3		6.6	6.4
tC, 2 stage (s)					5.6	
tF (s)			2.4		3.7	3.5
p0 queue free %			100		100	79
cM capacity (veh/h)			1389		632	934

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	85	390	200
Volume Left	0	0	0
Volume Right	0	0	200
cSH	1700	1700	934
Volume to Capacity	0.05	0.23	0.21
Queue Length 95th (ft)	0	0	20
Control Delay (s)	0.0	0.0	9.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.9
Approach LOS			A

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	160	120	0	5	15	85	275	15	225	600	25	25
Future Volume (vph)	160	120	0	5	15	85	275	15	225	600	25	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	11	12	11	12	8	12	12	12	13	12	12	12
Total Lost time (s)	11.5	11.5	11.5			12.0	12.0		5.0	10.0		
Lane Util. Factor	1.00	1.00	1.00			1.00	1.00		1.00	0.95		
Frpb, ped/bikes	1.00	1.00	0.94			1.00	0.98		1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00		1.00	1.00		
Frt	1.00	1.00	0.85			1.00	0.85		1.00	0.99		
Flt Protected	0.95	1.00	1.00			0.99	1.00		0.95	1.00		
Satd. Flow (prot)	1502	1636	1269			1639	1381		1576	3022		
Flt Permitted	0.95	1.00	1.00			0.99	1.00		0.95	1.00		
Satd. Flow (perm)	1502	1636	1269			1639	1381		1576	3022		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	120	0	5	15	85	275	15	225	600	25	25
RTOR Reduction (vph)	0	0	4	0	0	0	244	0	0	2	0	0
Lane Group Flow (vph)	160	120	1	0	0	100	31	0	240	623	0	0
Confl. Peds. (#/hr)			7	7			3				22	
Heavy Vehicles (%)	7%	7%	7%	7%	6%	6%	6%	9%	9%	9%	9%	4%
Turn Type	Split	NA	Perm		Split	NA	Perm	Prot	Prot	NA		Prot
Protected Phases	4	4			3	3		5	5	2		1
Permitted Phases			4				3					
Actuated Green, G (s)	20.9	20.9	20.9			16.2	16.2		34.0	43.0		
Effective Green, g (s)	20.9	20.9	20.9			16.2	16.2		34.0	43.0		
Actuated g/C Ratio	0.14	0.14	0.14			0.11	0.11		0.23	0.30		
Clearance Time (s)	11.5	11.5	11.5			12.0	12.0		5.0	10.0		
Vehicle Extension (s)	2.0	2.0	2.0			2.5	2.5		3.0	3.0		
Lane Grp Cap (vph)	216	235	182			183	154		369	896		
v/s Ratio Prot	c0.11	0.07				c0.06			0.15	c0.21		
v/s Ratio Perm			0.00				0.02					
v/c Ratio	0.74	0.51	0.00			0.55	0.20		0.65	0.70		
Uniform Delay, d1	59.5	57.3	53.1			60.9	58.5		50.1	45.2		
Progression Factor	1.00	1.00	1.00			1.00	1.00		1.26	0.54		
Incremental Delay, d2	11.3	0.8	0.0			2.6	0.5		3.8	4.1		
Delay (s)	70.7	58.1	53.1			63.5	59.0		66.9	28.3		
Level of Service	E	E	D			E	E		E	C		
Approach Delay (s)		65.1				60.2				39.0		
Approach LOS		E				E				D		

Intersection Summary			
HCM 2000 Control Delay	53.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	38.5
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Traffic Volume (vph)	175	635	110	80
Future Volume (vph)	175	635	110	80
Ideal Flow (vphpl)	1750	1750	1750	1750
Lane Width	11	11	12	14
Total Lost time (s)	5.0	10.0	10.0	
Lane Util. Factor	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.96	
Flpb, ped/bikes	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	
Satd. Flow (prot)	1545	3091	1379	
Flt Permitted	0.95	1.00	1.00	
Satd. Flow (perm)	1545	3091	1379	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	635	110	80
RTOR Reduction (vph)	0	0	144	0
Lane Group Flow (vph)	200	635	46	0
Confl. Peds. (#/hr)				5
Heavy Vehicles (%)	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	
Protected Phases	1	6		
Permitted Phases			6	
Actuated Green, G (s)	26.4	35.4	35.4	
Effective Green, g (s)	26.4	35.4	35.4	
Actuated g/C Ratio	0.18	0.24	0.24	
Clearance Time (s)	5.0	10.0	10.0	
Vehicle Extension (s)	2.0	3.0	3.0	
Lane Grp Cap (vph)	281	754	336	
v/s Ratio Prot	c0.13	c0.21		
v/s Ratio Perm			0.03	
v/c Ratio	0.71	0.84	0.14	
Uniform Delay, d1	55.7	52.1	42.9	
Progression Factor	1.00	1.00	1.00	
Incremental Delay, d2	6.9	11.0	0.9	
Delay (s)	62.6	63.2	43.7	
Level of Service	E	E	D	
Approach Delay (s)		59.5		
Approach LOS		E		

Intersection Summary

Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR	NEL	NER
Lane Configurations												
Traffic Volume (vph)	200	0	235	0	600	245	10	245	955	170	0	0
Future Volume (vph)	200	0	235	0	600	245	10	245	955	170	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	10.5		5.0		5.0	5.0		10.0	5.0	5.0		
Lane Util. Factor	0.97		1.00		0.95	1.00		1.00	0.95	1.00		
Frpb, ped/bikes	1.00		0.82		1.00	0.78		1.00	1.00	1.00		
Flpb, ped/bikes	1.00		1.00		1.00	1.00		0.99	1.00	1.00		
Frt	1.00		0.85		1.00	0.85		1.00	1.00	0.85		
Flt Protected	0.95		1.00		1.00	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	3072		1156		2995	1044		1590	3228	1444		
Flt Permitted	0.95		1.00		1.00	1.00		0.31	1.00	1.00		
Satd. Flow (perm)	3072		1156		2995	1044		523	3228	1444		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	0	235	0	600	245	10	245	955	170	0	0
RTOR Reduction (vph)	0	0	223	0	0	127	0	0	0	59	0	0
Lane Group Flow (vph)	200	0	12	0	600	118	0	255	955	111	0	0
Confl. Peds. (#/hr)			29			76		76				
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	11%	11%	11%	3%	3%	3%	3%	0%	0%
Turn Type	Prot		Perm		NA	Perm	pm+pt	pm+pt	NA	Perm		
Protected Phases	8				2		1	1	6			
Permitted Phases			4			2	6	6		6		
Actuated Green, G (s)	34.7		7.2		69.5	69.5		94.8	94.8	94.8		
Effective Green, g (s)	34.7		7.2		69.5	69.5		94.8	94.8	94.8		
Actuated g/C Ratio	0.24		0.05		0.48	0.48		0.65	0.65	0.65		
Clearance Time (s)	10.5		5.0		5.0	5.0		10.0	5.0	5.0		
Vehicle Extension (s)	3.0		3.0		3.0	3.0		2.0	3.0	3.0		
Lane Grp Cap (vph)	735		57		1435	500		454	2110	944		
v/s Ratio Prot	c0.07				0.20			0.06	c0.30			
v/s Ratio Perm			c0.01			0.11		c0.31		0.08		
v/c Ratio	0.27		0.20		0.42	0.24		0.56	0.45	0.12		
Uniform Delay, d1	44.9		66.2		24.6	22.2		12.7	12.3	9.4		
Progression Factor	1.00		1.00		0.39	0.56		1.16	1.39	3.00		
Incremental Delay, d2	0.2		1.8		0.8	1.0		0.9	0.7	0.2		
Delay (s)	45.1		67.9		10.5	13.5		15.6	17.9	28.5		
Level of Service	D		E		B	B		B	B	C		
Approach Delay (s)		57.4			11.4				18.8		0.0	
Approach LOS		E			B				B		A	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

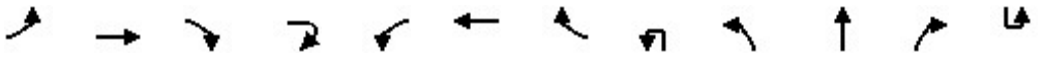
Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	190	5	0	645	25	0	15	20	245	675	15	5
Future Volume (vph)	190	5	0	645	25	0	15	20	245	675	15	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	12.0	12.0	12.0		12.0	12.0			5.0	10.0	10.0	
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00			0.97	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.93		1.00	0.97			1.00	1.00	0.84	
Flpb, ped/bikes	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			1.00	1.00	0.85	
Flt Protected	0.95	0.95	1.00		0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)	1316	1323	1149		1662	1445			2906	2995	1127	
Flt Permitted	0.95	0.95	1.00		0.95	1.00			0.95	1.00	1.00	
Satd. Flow (perm)	1316	1323	1149		1662	1445			2906	2995	1127	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	190	5	0	645	25	0	15	20	245	675	15	5
RTOR Reduction (vph)	0	0	467	0	0	15	0	0	0	0	9	0
Lane Group Flow (vph)	97	98	178	0	25	0	0	0	265	675	6	0
Confl. Peds. (#/hr)	17		57		57		17		21		51	
Heavy Vehicles (%)	20%	20%	20%	20%	0%	0%	0%	11%	11%	11%	11%	4%
Turn Type	Split	NA	Perm		Split	NA		Prot	Prot	NA	Perm	Prot
Protected Phases	3	3			4	4		5	5	2		1
Permitted Phases			3								2	
Actuated Green, G (s)	40.0	40.0	40.0		4.7	4.7			12.0	58.7	58.7	
Effective Green, g (s)	40.0	40.0	40.0		4.7	4.7			12.0	58.7	58.7	
Actuated g/C Ratio	0.28	0.28	0.28		0.03	0.03			0.08	0.40	0.40	
Clearance Time (s)	12.0	12.0	12.0		12.0	12.0			5.0	10.0	10.0	
Vehicle Extension (s)	2.5	2.5	2.5		2.0	2.0			3.0	3.0	3.0	
Lane Grp Cap (vph)	363	364	316		53	46			240	1212	456	
v/s Ratio Prot	0.07	0.07			c0.02	0.00			c0.09	0.23		
v/s Ratio Perm			c0.15								0.01	
v/c Ratio	0.27	0.27	0.56		0.47	0.01			1.10	0.56	0.01	
Uniform Delay, d1	41.0	41.1	45.0		68.9	67.9			66.5	33.2	25.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00			0.83	1.31	1.00	
Incremental Delay, d2	0.3	0.3	1.9		2.4	0.0			87.9	1.8	0.1	
Delay (s)	41.3	41.4	46.9		71.3	67.9			143.1	45.1	25.9	
Level of Service	D	D	D		E	E			F	D	C	
Approach Delay (s)		45.6				70.1				72.0		
Approach LOS		D				E				E		

Intersection Summary			
HCM 2000 Control Delay	56.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	39.0
Intersection Capacity Utilization	123.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	5	995	175
Future Volume (vph)	5	995	175
Ideal Flow (vphpl)	1750	1750	1750
Total Lost time (s)	5.0	10.0	10.0
Lane Util. Factor	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1599	3197	1430
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1599	3197	1430
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	5	995	175
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	10	995	175
Confl. Peds. (#/hr)	51		
Heavy Vehicles (%)	4%	4%	4%
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	2.6	49.3	49.3
Effective Green, g (s)	2.6	49.3	49.3
Actuated g/C Ratio	0.02	0.34	0.34
Clearance Time (s)	5.0	10.0	10.0
Vehicle Extension (s)	2.0	3.0	3.0
Lane Grp Cap (vph)	28	1086	486
v/s Ratio Prot	0.01	c0.31	
v/s Ratio Perm			0.12
v/c Ratio	0.36	0.92	0.36
Uniform Delay, d1	70.4	45.9	36.0
Progression Factor	1.06	0.86	1.02
Incremental Delay, d2	2.6	12.6	1.9
Delay (s)	76.9	51.9	38.5
Level of Service	E	D	D
Approach Delay (s)		50.1	
Approach LOS		D	

Intersection Summary



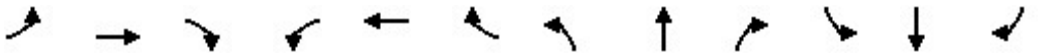
Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	135	660	0	315	215	785	205	15	160	260	150	20
Future Volume (vph)	135	660	0	315	215	785	205	15	160	260	150	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	12.0	12.0		7.0	12.0	12.0		6.0	11.0	11.0	
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00		0.97	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.95		1.00	1.00	0.96		1.00	1.00	0.93	
Flpb, ped/bikes	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	1.00	0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1568	3137	1337		1583	3167	1359		3072	3167	1322	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1568	3137	1337		1583	3167	1359		3072	3167	1322	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	660	0	315	215	785	205	15	160	260	150	20
RTOR Reduction (vph)	0	0	240	0	0	0	150	0	0	0	107	0
Lane Group Flow (vph)	135	660	75	0	215	785	55	0	175	260	43	0
Confl. Peds. (#/hr)	25		29		29		25		32		36	
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	5%	5%	5%	7%
Turn Type	Prot	NA	Perm		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4			3	8		5	5	2		1
Permitted Phases			4				8				2	
Actuated Green, G (s)	13.6	34.7	34.7		18.0	39.1	39.1		8.3	41.3	41.3	
Effective Green, g (s)	13.6	34.7	34.7		18.0	39.1	39.1		8.3	41.3	41.3	
Actuated g/C Ratio	0.09	0.24	0.24		0.12	0.27	0.27		0.06	0.28	0.28	
Clearance Time (s)	7.0	12.0	12.0		7.0	12.0	12.0		6.0	11.0	11.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0		4.0	3.0	3.0	
Lane Grp Cap (vph)	147	750	319		196	853	366		175	902	376	
v/s Ratio Prot	c0.09	c0.21			0.14	c0.25			0.06	0.08		
v/s Ratio Perm			0.06				0.04				0.03	
v/c Ratio	0.92	0.88	0.24		1.10	0.92	0.15		1.00	0.29	0.11	
Uniform Delay, d1	65.1	53.1	44.5		63.5	51.4	40.3		68.3	40.4	38.3	
Progression Factor	0.58	0.41	1.00		1.00	1.00	1.00		0.81	0.93	1.00	
Incremental Delay, d2	32.0	6.4	0.2		92.6	15.0	0.2		67.5	0.8	0.6	
Delay (s)	69.6	28.1	44.7		156.1	66.4	40.5		123.1	38.3	38.9	
Level of Service	E	C	D		F	E	D		F	D	D	
Approach Delay (s)		37.9				78.0				63.8		
Approach LOS		D				E				E		

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Traffic Volume (vph)	220	1000	180	215
Future Volume (vph)	220	1000	180	215
Ideal Flow (vphpl)	1750	1750	1750	1750
Total Lost time (s)	6.0	11.0	11.0	
Lane Util. Factor	0.97	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.94	
Flpb, ped/bikes	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	
Satd. Flow (prot)	3014	3107	1312	
Flt Permitted	0.95	1.00	1.00	
Satd. Flow (perm)	3014	3107	1312	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	1000	180	215
RTOR Reduction (vph)	0	0	171	0
Lane Group Flow (vph)	240	1000	224	0
Confl. Peds. (#/hr)	36			32
Heavy Vehicles (%)	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	
Protected Phases	1	6		
Permitted Phases			6	
Actuated Green, G (s)	15.0	48.0	48.0	
Effective Green, g (s)	15.0	48.0	48.0	
Actuated g/C Ratio	0.10	0.33	0.33	
Clearance Time (s)	6.0	11.0	11.0	
Vehicle Extension (s)	4.0	3.0	3.0	
Lane Grp Cap (vph)	311	1028	434	
v/s Ratio Prot	c0.08	c0.32		
v/s Ratio Perm			0.17	
v/c Ratio	0.77	0.97	0.52	
Uniform Delay, d1	63.3	47.9	39.1	
Progression Factor	1.35	0.58	0.24	
Incremental Delay, d2	10.2	20.0	3.7	
Delay (s)	95.9	47.9	12.9	
Level of Service	F	D	B	
Approach Delay (s)		46.5		
Approach LOS		D		

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	880	365	285	845	50	100	15	130	55	55	15
Future Volume (vph)	20	880	365	285	845	50	100	15	130	55	55	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.0	11.0		6.0	11.0		6.5	11.5	11.5	6.5	11.5	
Lane Util. Factor	1.00	0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	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	
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	4333		1554	3075		1498	1577	1300	1471	1487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	4333		1554	3075		1498	1577	1300	1471	1487	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	880	365	285	845	50	100	15	130	55	55	15
RTOR Reduction (vph)	0	51	0	0	3	0	0	0	105	0	7	0
Lane Group Flow (vph)	20	1194	0	285	892	0	100	15	25	55	63	0
Confl. Peds. (#/hr)	5		1	1		5	15		10	10		15
Heavy Vehicles (%)	5%	5%	5%	7%	7%	7%	11%	11%	11%	13%	13%	13%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			
Actuated Green, G (s)	5.3	40.0		31.9	66.6		11.8	28.1	28.1	10.0	26.3	
Effective Green, g (s)	5.3	40.0		31.9	66.6		11.8	28.1	28.1	10.0	26.3	
Actuated g/C Ratio	0.04	0.28		0.22	0.46		0.08	0.19	0.19	0.07	0.18	
Clearance Time (s)	6.0	11.0		6.0	11.0		6.5	11.5	11.5	6.5	11.5	
Vehicle Extension (s)	2.0	2.0		3.0	2.0		2.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	57	1195		341	1412		121	305	251	101	269	
v/s Ratio Prot	0.01	c0.28		c0.18	0.29		c0.07	0.01		c0.04	c0.04	
v/s Ratio Perm									0.02			
v/c Ratio	0.35	1.00		0.84	0.63		0.83	0.05	0.10	0.54	0.24	
Uniform Delay, d1	68.2	52.5		54.0	29.9		65.6	47.6	48.1	65.3	50.8	
Progression Factor	1.00	1.00		0.84	0.44		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	25.5		8.7	0.3		33.5	0.3	0.8	5.9	2.1	
Delay (s)	69.5	78.0		54.0	13.5		99.1	47.9	48.9	71.2	52.8	
Level of Service	E	E		D	B		F	D	D	E	D	
Approach Delay (s)		77.9			23.3			69.3			60.9	
Approach LOS		E			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	53.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	35.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

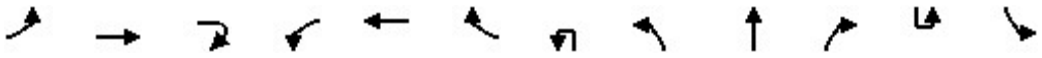
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	5	15	5	115	15	15	10	5	130	105	5	65
Future Volume (vph)	5	15	5	115	15	15	10	5	130	105	5	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	10.0	10.0		10.0	10.0			10.0	10.0			5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95			1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97			1.00	0.99			1.00
Flpb, ped/bikes	0.96	1.00		1.00	1.00			1.00	1.00			0.99
Frt	1.00	0.96		1.00	0.93			1.00	0.93			1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)	1358	1435		1582	1498			1583	2913			1616
Flt Permitted	0.74	1.00		0.74	1.00			0.33	1.00			0.61
Satd. Flow (perm)	1055	1435		1240	1498			550	2913			1030
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	15	5	115	15	15	10	5	130	105	5	65
RTOR Reduction (vph)	0	4	0	0	12	0	0	0	66	0	0	0
Lane Group Flow (vph)	5	16	0	115	18	0	0	15	169	0	0	70
Confl. Peds. (#/hr)	77		1	1		77				9		9
Heavy Vehicles (%)	17%	17%	17%	5%	5%	5%	5%	5%	5%	5%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	Perm	NA		Perm	Perm
Protected Phases		8			4				6			
Permitted Phases	8			4			6	6			2	2
Actuated Green, G (s)	7.3	7.3		7.3	7.3			16.4	16.4			21.4
Effective Green, g (s)	7.3	7.3		7.3	7.3			16.4	16.4			21.4
Actuated g/C Ratio	0.17	0.17		0.17	0.17			0.38	0.38			0.49
Clearance Time (s)	10.0	10.0		10.0	10.0			10.0	10.0			5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0			2.0
Lane Grp Cap (vph)	176	239		207	250			206	1093			504
v/s Ratio Prot		0.01			0.01				0.06			
v/s Ratio Perm	0.00			c0.09				0.03				0.07
v/c Ratio	0.03	0.07		0.56	0.07			0.07	0.15			0.14
Uniform Delay, d1	15.2	15.3		16.7	15.3			8.8	9.1			6.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00			1.00
Incremental Delay, d2	0.0	0.0		1.8	0.0			0.1	0.0			0.0
Delay (s)	15.3	15.4		18.5	15.4			8.8	9.1			6.2
Level of Service	B	B		B	B			A	A			A
Approach Delay (s)		15.3			17.9				9.1			
Approach LOS		B			B				A			

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	43.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	750	15
Future Volume (vph)	750	15
Ideal Flow (vphpl)	1750	1750
Total Lost time (s)	5.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3250	
Flt Permitted	1.00	
Satd. Flow (perm)	3250	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	750	15
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	763	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	2%
Turn Type	NA	
Protected Phases	2	
Permitted Phases		
Actuated Green, G (s)	21.4	
Effective Green, g (s)	21.4	
Actuated g/C Ratio	0.49	
Clearance Time (s)	5.0	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	1591	
v/s Ratio Prot	c0.23	
v/s Ratio Perm		
v/c Ratio	0.48	
Uniform Delay, d1	7.4	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	7.5	
Level of Service	A	
Approach Delay (s)	7.4	
Approach LOS	A	

Intersection Summary



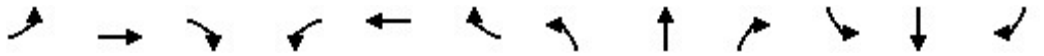
Movement	EBL	EBT	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	95	35	70	35	10	40	25	25	440	25	20	50
Future Volume (vph)	95	35	70	35	10	40	25	25	440	25	20	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	11.0	11.0			11.0	11.0		5.0	10.0			5.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	0.95			1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99		1.00	0.99			1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00		1.00	1.00			0.98
Frt	1.00	0.90			1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00			0.96	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1566	1486			1594	1398		1608	3184			1587
Flt Permitted	0.73	1.00			0.71	1.00		0.22	1.00			0.46
Satd. Flow (perm)	1200	1486			1167	1398		377	3184			762
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	35	70	35	10	40	25	25	440	25	20	50
RTOR Reduction (vph)	0	88	0	0	0	34	0	0	2	0	0	0
Lane Group Flow (vph)	95	17	0	0	45	6	0	50	463	0	0	70
Confl. Peds. (#/hr)	1			8		1		31		24		24
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	pm+pt	NA		pm+pt	pm+pt
Protected Phases		8			4		1	1	6		5	5
Permitted Phases	8			4		4	6	6			2	2
Actuated Green, G (s)	22.9	22.9			22.9	22.9		95.5	90.5			90.5
Effective Green, g (s)	22.9	22.9			22.9	22.9		95.5	90.5			90.5
Actuated g/C Ratio	0.16	0.16			0.16	0.16		0.66	0.62			0.62
Clearance Time (s)	11.0	11.0			11.0	11.0		5.0	10.0			5.0
Vehicle Extension (s)	4.0	4.0			4.0	4.0		2.0	4.0			2.0
Lane Grp Cap (vph)	189	234			184	220		295	1987			507
v/s Ratio Prot		0.01						c0.01	0.15			0.01
v/s Ratio Perm	c0.08				0.04	0.00		0.10				0.08
v/c Ratio	0.50	0.07			0.24	0.03		0.17	0.23			0.14
Uniform Delay, d1	55.8	52.0			53.5	51.6		12.8	12.0			10.8
Progression Factor	1.00	1.00			1.00	1.00		0.54	0.55			0.34
Incremental Delay, d2	2.9	0.2			0.9	0.1		0.1	0.2			0.0
Delay (s)	58.7	52.2			54.4	51.7		7.0	6.8			3.7
Level of Service	E	D			D	D		A	A			A
Approach Delay (s)		55.3			53.1				6.8			
Approach LOS		E			D				A			

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR	SBR2
Lane Configurations			
Traffic Volume (vph)	1165	190	100
Future Volume (vph)	1165	190	100
Ideal Flow (vphpl)	1750	1750	1750
Total Lost time (s)	10.0	10.0	
Lane Util. Factor	0.95	1.00	
Frpb, ped/bikes	1.00	0.84	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	1.00	1.00	
Satd. Flow (prot)	3228	1216	
Flt Permitted	1.00	1.00	
Satd. Flow (perm)	3228	1216	
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1165	190	100
RTOR Reduction (vph)	0	51	0
Lane Group Flow (vph)	1165	239	0
Confl. Peds. (#/hr)			31
Heavy Vehicles (%)	3%	3%	3%
Turn Type	NA	Perm	
Protected Phases	2		
Permitted Phases		2	
Actuated Green, G (s)	90.5	90.5	
Effective Green, g (s)	90.5	90.5	
Actuated g/C Ratio	0.62	0.62	
Clearance Time (s)	10.0	10.0	
Vehicle Extension (s)	4.0	4.0	
Lane Grp Cap (vph)	2014	758	
v/s Ratio Prot	c0.36		
v/s Ratio Perm		0.20	
v/c Ratio	0.58	0.32	
Uniform Delay, d1	16.0	12.8	
Progression Factor	0.48	0.20	
Incremental Delay, d2	0.7	0.6	
Delay (s)	8.4	3.2	
Level of Service	A	A	
Approach Delay (s)	7.2		
Approach LOS	A		

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	75	205	400	215	60	245	180	170	65	300	55
Future Volume (vph)	10	75	205	400	215	60	245	180	170	65	300	55
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	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	0.99	1.00	0.99		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	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.98	
Flt Protected		0.99	1.00	0.95	0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1706	1458	1519	1574	1409	1630	2991		1645	3216	
Flt Permitted		0.99	1.00	0.95	0.98	1.00	0.34	1.00		0.54	1.00	
Satd. Flow (perm)		1706	1458	1519	1574	1409	582	2991		939	3216	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	75	205	400	215	60	245	180	170	65	300	55
RTOR Reduction (vph)	0	0	181	0	0	43	0	121	0	0	12	0
Lane Group Flow (vph)	0	85	24	304	311	17	245	229	0	65	343	0
Confl. Peds. (#/hr)	3					3			1	1		
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4	6			2		
Actuated Green, G (s)		10.4	10.4	25.3	25.3	25.3	37.2	25.4		23.9	17.1	
Effective Green, g (s)		10.4	10.4	25.3	25.3	25.3	37.2	25.4		23.9	17.1	
Actuated g/C Ratio		0.12	0.12	0.29	0.29	0.29	0.42	0.29		0.27	0.19	
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	3.0	3.0	3.0	3.0	3.0	3.5		3.5	3.5	
Lane Grp Cap (vph)		201	172	437	453	405	426	864		309	625	
v/s Ratio Prot		c0.05		c0.20	0.20		c0.10	0.08		0.02	0.11	
v/s Ratio Perm			0.02			0.01	c0.14			0.04		
v/c Ratio		0.42	0.14	0.70	0.69	0.04	0.58	0.27		0.21	0.55	
Uniform Delay, d1		36.0	34.7	27.9	27.8	22.6	17.7	24.1		24.3	31.9	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4	0.4	4.8	4.3	0.0	1.9	0.2		0.4	1.1	
Delay (s)		37.4	35.1	32.6	32.1	22.6	19.6	24.3		24.7	33.0	
Level of Service		D	D	C	C	C	B	C		C	C	
Approach Delay (s)		35.8			31.5			22.3			31.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

LANE SUMMARY

Site: 72 [72-Des Moines Memorial Dr @ SR 509 SB Ramps (Site Folder: 2032 PA)]

72-Des Moines Memorial Dr @ SR 509 SB Ramps, 2032 Proposed Action
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Des Moines Memorial Dr (WB)													
Lane 1[d]	595	9.0	1252	0.475	100	4.6	LOS A	3.9	104.1	Full	1000	0.0	0.0
Approach	595	9.0		0.475		4.6	LOS A	3.9	104.1				
North: SR 509 Ramps													
Lane 1	440	3.0	968	0.454	100	12.5	LOS B	3.1	78.8	Full	1600	0.0	0.0
Lane 2[d]	540	3.0	1189	0.454	100	11.9	LOS B	3.3	84.0	Full	1600	0.0	0.0
Lane 3	780	3.0	1189	0.656	100	8.8	LOS A	7.1	180.8	Short	500	0.0	NA
Approach	1760	3.0		0.656		10.7	LOS B	7.1	180.8				
West: Des Moines Memorial Dr (EB)													
Lane 1	397	4.0	674	0.589	100	10.7	LOS B	3.7	95.0	Full	1600	0.0	0.0
Lane 2[d]	483	4.0	819	0.589	100	8.9	LOS A	3.9	101.2	Full	1600	0.0	0.0
Approach	880	4.0		0.589		9.7	LOS A	3.9	101.2				
Intersection	3235	4.4		0.656		9.3	LOS A	7.1	180.8				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

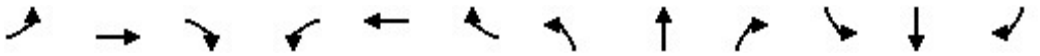
Approach Lane Flows (veh/h)

East: Des Moines Memorial Dr (WB)

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	435	160	595	9.0	1252	0.475	100	NA	NA
Approach	435	160	595	9.0		0.475			

North: SR 509 Ramps

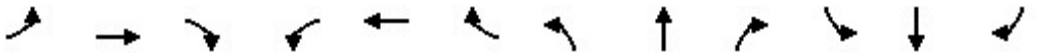
Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	440	-	440	3.0	968	0.454	100	NA	NA
Lane 2	540	-	540	3.0	1189	0.454	100	NA	NA
Lane 3	-	780	780	3.0	1189	0.656	100	0.0	2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	905	615	40	785	5	340	0	35	10	5	15
Future Volume (vph)	10	905	615	40	785	5	340	0	35	10	5	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.3	5.3	5.3	5.3	5.3		5.5	5.5			5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1599	3197	1398	1599	3194		3072	1417			1605	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.30	
Satd. Flow (perm)	1599	3197	1398	1599	3194		3072	1417			490	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	905	615	40	785	5	340	0	35	10	5	15
RTOR Reduction (vph)	0	0	193	0	0	0	0	29	0	0	13	0
Lane Group Flow (vph)	10	905	422	40	790	0	340	6	0	0	17	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Perm	NA	
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2							3		
Actuated Green, G (s)	1.2	50.5	50.5	6.2	55.5		18.5	18.5			15.2	
Effective Green, g (s)	1.2	50.5	50.5	6.2	55.5		18.5	18.5			15.2	
Actuated g/C Ratio	0.01	0.45	0.45	0.06	0.50		0.17	0.17			0.14	
Clearance Time (s)	5.3	5.3	5.3	5.3	5.3		5.5	5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0			3.0	
Lane Grp Cap (vph)	17	1441	630	88	1582		507	234			66	
v/s Ratio Prot	0.01	0.28		c0.03	c0.25		c0.11	0.00				
v/s Ratio Perm			c0.30								c0.03	
v/c Ratio	0.59	0.63	0.67	0.45	0.50		0.67	0.02			0.26	
Uniform Delay, d1	55.2	23.6	24.2	51.3	18.9		43.9	39.2			43.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	42.8	0.9	2.7	1.4	0.2		2.7	0.0			2.1	
Delay (s)	97.9	24.4	26.9	52.6	19.2		46.6	39.2			45.4	
Level of Service	F	C	C	D	B		D	D			D	
Approach Delay (s)		25.9			20.8			45.9			45.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	63.2%	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)	85	305	100	135	145	215	70	330	85	75	375	50
Future Volume (vph)	85	305	100	135	145	215	70	330	85	75	375	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.0	6.0		5.0	5.0		5.2	5.2	5.2	5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	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	
Frt	1.00	0.96		1.00	0.91		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1614	1627		1646	1557		1614	1699	1413	1629	1681	
Flt Permitted	0.40	1.00		0.26	1.00		0.24	1.00	1.00	0.38	1.00	
Satd. Flow (perm)	686	1627		451	1557		403	1699	1413	645	1681	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	85	305	100	135	145	215	70	330	85	75	375	50
RTOR Reduction (vph)	0	8	0	0	41	0	0	0	59	0	3	0
Lane Group Flow (vph)	85	397	0	135	319	0	70	330	26	75	422	0
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	34.2	28.1		42.4	32.2		34.4	28.4	28.4	34.0	28.2	
Effective Green, g (s)	34.2	28.1		42.4	32.2		34.4	28.4	28.4	34.0	28.2	
Actuated g/C Ratio	0.36	0.30		0.45	0.34		0.37	0.30	0.30	0.36	0.30	
Clearance Time (s)	6.0	6.0		5.0	5.0		5.2	5.2	5.2	5.2	5.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	310	486		333	533		225	513	427	294	504	
v/s Ratio Prot	0.02	c0.24		c0.04	c0.20		c0.02	0.19		0.02	c0.25	
v/s Ratio Perm	0.08			0.14			0.09		0.02	0.08		
v/c Ratio	0.27	0.82		0.41	0.60		0.31	0.64	0.06	0.26	0.84	
Uniform Delay, d1	20.3	30.5		17.0	25.5		21.1	28.4	23.3	20.5	30.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	9.7		0.3	1.2		0.3	2.1	0.0	0.2	11.0	
Delay (s)	20.5	40.2		17.3	26.7		21.4	30.4	23.3	20.7	41.7	
Level of Service	C	D		B	C		C	C	C	C	D	
Approach Delay (s)		36.8			24.1			27.9			38.6	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	21.4
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

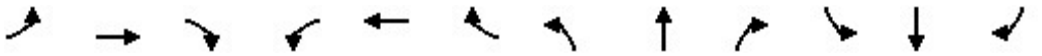
c Critical Lane Group

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	60	850	45	15	150	1165	120	35	25	20	35	15
Future Volume (vph)	60	850	45	15	150	1165	120	35	25	20	35	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.6	9.9			5.0	9.7			10.0			10.0
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00			1.00
Frpb, ped/bikes	1.00	1.00			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	0.99			1.00	0.99			0.97			0.94
Flt Protected	0.95	1.00			0.95	1.00			0.98			0.98
Satd. Flow (prot)	1599	3169			1599	3146			1614			1595
Flt Permitted	0.95	1.00			0.95	1.00			0.81			0.85
Satd. Flow (perm)	1599	3169			1599	3146			1343			1372
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	850	45	15	150	1165	120	35	25	20	35	15
RTOR Reduction (vph)	0	4	0	0	0	6	0	0	18	0	0	40
Lane Group Flow (vph)	60	891	0	0	165	1279	0	0	62	0	0	55
Confl. Peds. (#/hr)			1				1	3		4	4	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	2%	2%	2%	0%	0%
Bus Blockages (#/hr)	0	0	48	0	0	0	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	1	6		5	5	2			8			8
Permitted Phases								8			8	
Actuated Green, G (s)	5.3	35.7			9.7	40.7			9.7			9.7
Effective Green, g (s)	5.3	35.7			9.7	40.7			9.7			9.7
Actuated g/C Ratio	0.07	0.45			0.12	0.51			0.12			0.12
Clearance Time (s)	4.6	9.9			5.0	9.7			10.0			10.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0			5.0			5.0
Lane Grp Cap (vph)	105	1414			193	1600			162			166
v/s Ratio Prot	0.04	0.28			c0.10	c0.41						
v/s Ratio Perm									c0.05			0.04
v/c Ratio	0.57	0.63			0.85	0.80			0.39			0.33
Uniform Delay, d1	36.2	17.1			34.5	16.3			32.4			32.2
Progression Factor	1.00	1.00			1.00	1.00			1.00			1.00
Incremental Delay, d2	4.6	2.1			28.1	4.3			3.2			2.5
Delay (s)	40.8	19.2			62.5	20.5			35.6			34.7
Level of Service	D	B			E	C			D			C
Approach Delay (s)		20.6				25.3			35.6			34.7
Approach LOS		C				C			D			C

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.9
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

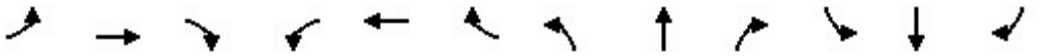
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1750
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	45
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	0%
Bus Blockages (#/hr)	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



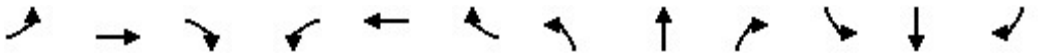
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	810	45	135	695	265	30	115	50	380	395	110
Future Volume (vph)	65	810	45	135	695	265	30	115	50	380	395	110
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.7	10.8		4.7	9.7	9.7	5.7	5.9		5.6	10.8	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		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)	1599	4557		1583	3167	1417	1646	1654		3162	1660	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1599	4557		1583	3167	1417	1646	1654		3162	1660	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	65	810	45	135	695	265	30	115	50	380	395	110
RTOR Reduction (vph)	0	5	0	0	0	161	0	16	0	0	9	0
Lane Group Flow (vph)	65	850	0	135	695	104	30	149	0	380	496	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2						
Actuated Green, G (s)	6.5	29.1		14.3	37.0	37.0	3.2	15.6		29.0	36.4	
Effective Green, g (s)	6.5	29.1		14.3	37.0	37.0	3.2	15.6		29.0	36.4	
Actuated g/C Ratio	0.06	0.25		0.12	0.32	0.32	0.03	0.14		0.25	0.32	
Clearance Time (s)	5.7	10.8		4.7	9.7	9.7	5.7	5.9		5.6	10.8	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0		2.0	2.0	
Lane Grp Cap (vph)	90	1153		196	1018	455	45	224		797	525	
v/s Ratio Prot	0.04	c0.19		c0.09	c0.22		0.02	c0.09		0.12	c0.30	
v/s Ratio Perm						0.07						
v/c Ratio	0.72	0.74		0.69	0.68	0.23	0.67	0.67		0.48	0.94	
Uniform Delay, d1	53.4	39.4		48.2	33.9	28.5	55.4	47.2		36.6	38.3	
Progression Factor	1.00	1.00		0.71	0.55	1.04	1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.3	4.2		6.7	3.2	1.0	31.5	7.3		0.2	25.7	
Delay (s)	74.7	43.7		40.7	21.9	30.7	86.8	54.5		36.7	64.1	
Level of Service	E	D		D	C	C	F	D		D	E	
Approach Delay (s)		45.9			26.3			59.5			52.3	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



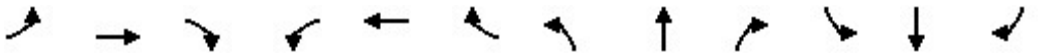
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	865	375	400	1020	0	0	0	0	540	10	75
Future Volume (vph)	0	865	375	400	1020	0	0	0	0	540	10	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.6	6.6	5.5	6.6					5.9	5.9	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.96	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.97	
Satd. Flow (prot)		3197	1430	1599	3197					1398	1368	
Flt Permitted		1.00	1.00	0.13	1.00					0.95	0.97	
Satd. Flow (perm)		3197	1430	224	3197					1398	1368	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	865	375	400	1020	0	0	0	0	540	10	75
RTOR Reduction (vph)	0	0	241	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	865	134	400	1020	0	0	0	0	319	295	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	13%	13%	13%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		37.1	37.1	69.0	69.0					33.5	33.5	
Effective Green, g (s)		37.1	37.1	69.0	69.0					33.5	33.5	
Actuated g/C Ratio		0.32	0.32	0.60	0.60					0.29	0.29	
Clearance Time (s)		6.6	6.6	5.5	6.6					5.9	5.9	
Vehicle Extension (s)		4.0	4.0	3.0	5.0					3.5	3.5	
Lane Grp Cap (vph)		1031	461	450	1918					407	398	
v/s Ratio Prot		0.27		c0.20	0.32							
v/s Ratio Perm			0.09	c0.33						c0.23	0.22	
v/c Ratio		0.84	0.29	0.89	0.53					0.78	0.74	
Uniform Delay, d1		36.2	29.1	28.9	13.5					37.4	36.8	
Progression Factor		0.53	1.33	1.44	0.67					1.00	1.00	
Incremental Delay, d2		6.6	1.3	14.0	0.7					9.8	7.5	
Delay (s)		25.9	40.1	55.6	9.8					47.2	44.3	
Level of Service		C	D	E	A					D	D	
Approach Delay (s)		30.2			22.7			0.0			45.8	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	124.3%	ICU Level of Service	H
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)	400	1005	0	0	955	975	465	0	175	0	0	0
Future Volume (vph)	400	1005	0	0	955	975	465	0	175	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.5	6.4			6.4	6.4	6.0	6.0				
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95				
Frt	1.00	1.00			1.00	0.85	1.00	0.92				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (prot)	1554	3107			3197	1430	1449	1366				
Flt Permitted	0.22	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (perm)	353	3107			3197	1430	1449	1366				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	1005	0	0	955	975	465	0	175	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	179	0	70	0	0	0	0
Lane Group Flow (vph)	400	1005	0	0	955	796	330	240	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	4%	4%	4%	9%	9%	9%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Prot	Split	NA				
Protected Phases	5	2			6	6	4	4				
Permitted Phases	2											
Actuated Green, G (s)	75.4	74.5			54.5	54.5	28.1	28.1				
Effective Green, g (s)	75.4	74.5			54.5	54.5	28.1	28.1				
Actuated g/C Ratio	0.66	0.65			0.47	0.47	0.24	0.24				
Clearance Time (s)	5.5	6.4			6.4	6.4	6.0	6.0				
Vehicle Extension (s)	3.0	4.0			5.0	5.0	3.5	3.5				
Lane Grp Cap (vph)	382	2012			1515	677	354	333				
v/s Ratio Prot	c0.13	0.32			0.30	c0.56	c0.23	0.18				
v/s Ratio Perm	0.55											
v/c Ratio	1.05	0.50			0.63	1.18	0.93	0.72				
Uniform Delay, d1	27.7	10.5			22.7	30.2	42.5	39.8				
Progression Factor	0.63	0.60			1.00	1.00	1.00	1.00				
Incremental Delay, d2	50.1	0.6			2.0	93.8	31.2	7.5				
Delay (s)	67.6	6.9			24.7	124.1	73.7	47.4				
Level of Service	E	A			C	F	E	D				
Approach Delay (s)		24.2			74.9			60.9			0.0	
Approach LOS		C			E			E			A	

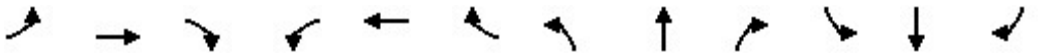
Intersection Summary			
HCM 2000 Control Delay	54.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	124.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	270	160	60	145	110	40	310	30	235	515	10
Future Volume (vph)	25	270	160	60	145	110	40	310	30	235	515	10
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	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	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	1603		1598	1683	1430	1614	1677		1630	1711	
Flt Permitted	0.65	1.00		0.23	1.00	1.00	0.23	1.00		0.37	1.00	
Satd. Flow (perm)	1116	1603		391	1683	1430	382	1677		635	1711	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	270	160	60	145	110	40	310	30	235	515	10
RTOR Reduction (vph)	0	18	0	0	0	62	0	3	0	0	1	0
Lane Group Flow (vph)	25	412	0	60	145	48	40	337	0	235	524	0
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	D.P+P	NA		D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	8			4		8	6			2		
Actuated Green, G (s)	35.5	29.5		35.5	31.9	42.3	41.3	30.9		41.3	37.4	
Effective Green, g (s)	35.5	29.5		35.5	31.9	42.3	41.3	30.9		41.3	37.4	
Actuated g/C Ratio	0.37	0.30		0.37	0.33	0.44	0.43	0.32		0.43	0.39	
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	2.0		3.0	2.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	428	488		218	554	698	212	535		377	661	
v/s Ratio Prot	0.00	c0.26		c0.02	0.09	0.01	0.01	0.20		c0.07	c0.31	
v/s Ratio Perm	0.02			0.08		0.03	0.07			0.20		
v/c Ratio	0.06	0.84		0.28	0.26	0.07	0.19	0.63		0.62	0.79	
Uniform Delay, d1	19.7	31.5		21.6	23.8	15.8	18.4	28.1		19.3	26.3	
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	12.1		0.7	0.1	0.0	0.4	1.7		3.2	6.1	
Delay (s)	19.8	43.6		22.3	23.9	15.9	18.8	29.7		22.5	32.4	
Level of Service	B	D		C	C	B	B	C		C	C	
Approach Delay (s)		42.3			20.8			28.6			29.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	96.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

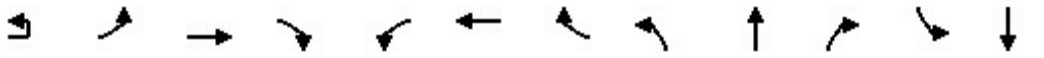
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	455	130	85	375	85	40	270	175	90	570	30
Future Volume (vph)	20	455	130	85	375	85	40	270	175	90	570	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		5.0	10.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3172		1599	1683	1408	1646	3079		1568	3109	
Flt Permitted	0.47	1.00		0.30	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	816	3172		512	1683	1408	1646	3079		1568	3109	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	455	130	85	375	85	40	270	175	90	570	30
RTOR Reduction (vph)	0	20	0	0	0	56	0	85	0	0	3	0
Lane Group Flow (vph)	20	565	0	85	375	29	40	360	0	90	597	0
Confl. Peds. (#/hr)			3			4	2		3	3		2
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	1%	1%	1%	6%	6%	6%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)	36.6	34.3		47.0	39.7	39.7	5.2	33.0		9.6	37.4	
Effective Green, g (s)	36.6	34.3		47.0	39.7	39.7	5.2	33.0		9.6	37.4	
Actuated g/C Ratio	0.32	0.30		0.41	0.35	0.35	0.05	0.29		0.08	0.33	
Clearance Time (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		5.0	10.0	
Vehicle Extension (s)	2.0	2.0		3.0	2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	277	949		283	583	487	74	886		131	1014	
v/s Ratio Prot	0.00	0.18		c0.02	c0.22		0.02	0.12		c0.06	c0.19	
v/s Ratio Perm	0.02			0.10		0.02						
v/c Ratio	0.07	0.60		0.30	0.64	0.06	0.54	0.41		0.69	0.59	
Uniform Delay, d1	27.0	34.2		21.7	31.5	25.0	53.5	32.9		51.0	32.2	
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	0.7		0.6	1.8	0.0	7.8	0.1		13.9	0.6	
Delay (s)	27.0	34.9		22.3	33.3	25.0	61.4	33.0		65.0	32.8	
Level of Service	C	C		C	C	C	E	C		E	C	
Approach Delay (s)		34.7			30.3			35.4			37.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	30.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



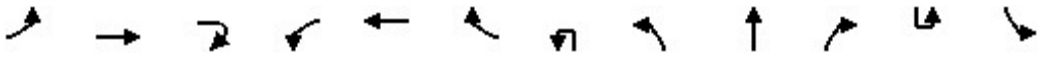
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	45	605	50	30	410	180	25	10	35	195	40
Future Volume (vph)	5	45	605	50	30	410	180	25	10	35	195	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.94		1.00	0.98		1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00	1.00		0.95	1.00		0.98	1.00
Frt		1.00	0.99		1.00	0.95		1.00	0.88		1.00	0.91
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1614	3139		1568	2806		1516	1452		1619	1516
Flt Permitted		0.40	1.00		0.38	1.00		0.66	1.00		0.73	1.00
Satd. Flow (perm)		683	3139		634	2806		1048	1452		1240	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	45	605	50	30	410	180	25	10	35	195	40
RTOR Reduction (vph)	0	0	3	0	0	22	0	0	28	0	0	41
Lane Group Flow (vph)	0	50	652	0	30	568	0	25	17	0	195	54
Confl. Peds. (#/hr)				38			39	31		9	9	
Heavy Vehicles (%)	3%	3%	3%	3%	6%	6%	6%	4%	4%	4%	1%	1%
Turn Type	pm+pt	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA
Protected Phases	7	7	4		3	8			2			6
Permitted Phases	4	4			8			2			6	
Actuated Green, G (s)		103.8	98.9		101.0	97.5		27.6	27.6		27.6	27.6
Effective Green, g (s)		103.8	98.9		101.0	97.5		27.6	27.6		27.6	27.6
Actuated g/C Ratio		0.72	0.68		0.70	0.67		0.19	0.19		0.19	0.19
Clearance Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		520	2141		464	1886		199	276		236	288
v/s Ratio Prot		c0.00	c0.21		0.00	0.20			0.01			0.04
v/s Ratio Perm		0.07			0.04			0.02			c0.16	
v/c Ratio		0.10	0.30		0.06	0.30		0.13	0.06		0.83	0.19
Uniform Delay, d1		6.2	9.3		6.9	9.8		48.7	48.1		56.4	49.3
Progression Factor		1.00	1.00		0.39	0.36		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.0	0.4		0.0	0.3		0.1	0.0		19.6	0.1
Delay (s)		6.2	9.6		2.7	3.8		48.8	48.1		76.0	49.4
Level of Service		A	A		A	A		D	D		E	D
Approach Delay (s)			9.4			3.7			48.4			67.3
Approach LOS			A			A			D			E

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	55
Future Volume (vph)	55
Ideal Flow (vphpl)	1750
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	31
Heavy Vehicles (%)	1%
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



Movement	EBL	EBT	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	590	145	45	335	115	5	180	470	185	10	315
Future Volume (vph)	85	590	145	45	335	115	5	180	470	185	10	315
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.0	11.0		5.0	11.0			5.0	10.0	10.0		5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.95		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.97		1.00	0.96			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1646	3195		1599	3034			1614	3228	1376		1614
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1646	3195		1599	3034			1614	3228	1376		1614
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	85	590	145	45	335	115	5	180	470	185	10	315
RTOR Reduction (vph)	0	156	0	0	23	0	0	0	0	109	0	0
Lane Group Flow (vph)	85	579	0	45	427	0	0	185	470	76	0	325
Confl. Peds. (#/hr)						31				20		
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	8.8	37.5		7.4	35.1			18.3	36.8	36.8		32.3
Effective Green, g (s)	8.8	37.5		7.4	35.1			18.3	36.8	36.8		32.3
Actuated g/C Ratio	0.06	0.26		0.05	0.24			0.13	0.25	0.25		0.22
Clearance Time (s)	6.0	11.0		5.0	11.0			5.0	10.0	10.0		5.0
Vehicle Extension (s)	2.0	2.0		3.0	2.0			2.0	3.0	3.0		3.0
Lane Grp Cap (vph)	99	826		81	734			203	819	349		359
v/s Ratio Prot	c0.05	c0.18		0.03	0.14			c0.11	0.15			0.20
v/s Ratio Perm										0.06		
v/c Ratio	0.86	0.70		0.56	0.58			0.91	0.57	0.22		0.91
Uniform Delay, d1	67.5	48.7		67.2	48.5			62.5	47.3	42.7		54.9
Progression Factor	0.96	0.92		1.00	1.00			0.91	0.88	1.23		0.84
Incremental Delay, d2	45.2	2.1		8.0	0.8			38.3	2.9	1.4		23.9
Delay (s)	110.1	47.1		75.2	49.2			95.1	44.3	53.9		69.9
Level of Service	F	D		E	D			F	D	D		E
Approach Delay (s)		53.6			51.6				57.6			
Approach LOS		D			D				E			

Intersection Summary			
HCM 2000 Control Delay	48.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR	SBR2
Lane Configurations			
Traffic Volume (vph)	1020	170	105
Future Volume (vph)	1020	170	105
Ideal Flow (vphpl)	1750	1750	1750
Total Lost time (s)	10.0	10.0	
Lane Util. Factor	0.95	1.00	
Frpb, ped/bikes	1.00	0.95	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	1.00	1.00	
Satd. Flow (prot)	3228	1368	
Flt Permitted	1.00	1.00	
Satd. Flow (perm)	3228	1368	
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1020	170	105
RTOR Reduction (vph)	0	118	0
Lane Group Flow (vph)	1020	157	0
Confl. Peds. (#/hr)			23
Heavy Vehicles (%)	3%	3%	3%
Turn Type	NA	Perm	
Protected Phases	6		
Permitted Phases		6	
Actuated Green, G (s)	50.8	50.8	
Effective Green, g (s)	50.8	50.8	
Actuated g/C Ratio	0.35	0.35	
Clearance Time (s)	10.0	10.0	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	1130	479	
v/s Ratio Prot	c0.32		
v/s Ratio Perm		0.12	
v/c Ratio	0.90	0.33	
Uniform Delay, d1	44.8	34.6	
Progression Factor	0.63	0.34	
Incremental Delay, d2	10.9	1.7	
Delay (s)	39.3	13.3	
Level of Service	D	B	
Approach Delay (s)	41.0		
Approach LOS	D		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	295	765	270	165	25	215	140	35	195	110	95
Future Volume (vph)	125	295	765	270	165	25	215	140	35	195	110	95
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.5	5.9	5.5	5.5	5.9		5.5	5.9	5.5	5.5	5.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	1716	1458	1599	1645		1630	1716	1458	1646	1612	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1630	1716	1458	1599	1645		1630	1716	1458	1646	1612	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	295	765	270	165	25	215	140	35	195	110	95
RTOR Reduction (vph)	0	0	224	0	4	0	0	0	22	0	25	0
Lane Group Flow (vph)	125	295	541	270	186	0	215	140	13	195	180	0
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	13.5	38.2	57.5	23.8	48.5		19.3	23.6	47.4	15.1	19.4	
Effective Green, g (s)	13.5	38.2	57.5	23.8	48.5		19.3	23.6	47.4	15.1	19.4	
Actuated g/C Ratio	0.11	0.31	0.47	0.19	0.39		0.16	0.19	0.38	0.12	0.16	
Clearance Time (s)	5.5	5.9	5.5	5.5	5.9		5.5	5.9	5.5	5.5	5.9	
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
Lane Grp Cap (vph)	178	530	678	308	646		254	327	559	201	253	
v/s Ratio Prot	0.08	0.17	c0.12	c0.17	0.11		c0.13	c0.08	0.00	0.12	c0.11	
v/s Ratio Perm			0.25						0.00			
v/c Ratio	0.70	0.56	0.80	0.88	0.29		0.85	0.43	0.02	0.97	0.71	
Uniform Delay, d1	53.1	35.6	28.1	48.4	25.7		50.7	44.0	23.7	54.0	49.4	
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	12.2	1.4	6.7	23.6	0.3		22.5	1.1	0.0	54.9	9.3	
Delay (s)	65.3	37.0	34.8	72.1	26.0		73.2	45.1	23.7	108.8	58.7	
Level of Service	E	D	C	E	C		E	D	C	F	E	
Approach Delay (s)		38.5			53.0			58.6			83.2	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	51.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	123.5	Sum of lost time (s)	22.8
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	20	5	0	25	70	0	40	10	630	50	10	55
Future Volume (vph)	20	5	0	25	70	0	40	10	630	50	10	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		3%				0%			0%			
Total Lost time (s)		11.0	11.0		11.0	11.0		5.0	10.0			5.0
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95			1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.98		1.00	1.00			1.00
Flpb, ped/bikes		0.99	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.85		1.00	0.85		1.00	0.99			1.00
Flt Protected		0.96	1.00		0.95	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1512	1322		1607	1417		1614	3182			1646
Flt Permitted		0.74	1.00		0.74	1.00		0.95	1.00			0.95
Satd. Flow (perm)		1166	1322		1253	1417		1614	3182			1646
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	5	0	25	70	0	40	10	630	50	10	55
RTOR Reduction (vph)	0	0	23	0	0	36	0	0	3	0	0	0
Lane Group Flow (vph)	0	25	2	0	70	4	0	10	677	0	0	65
Confl. Peds. (#/hr)	5		3		3		5	6		6		6
Heavy Vehicles (%)	9%	9%	9%	9%	3%	3%	3%	3%	3%	3%	1%	1%
Turn Type	Perm	NA	Perm		Perm	NA		Prot	NA		Prot	Prot
Protected Phases		4				8		5	2		1	1
Permitted Phases	4		4		8							
Actuated Green, G (s)		14.1	14.1		14.1	14.1		3.0	95.4			9.5
Effective Green, g (s)		14.1	14.1		14.1	14.1		3.0	95.4			9.5
Actuated g/C Ratio		0.10	0.10		0.10	0.10		0.02	0.66			0.07
Clearance Time (s)		11.0	11.0		11.0	11.0		5.0	10.0			5.0
Vehicle Extension (s)		4.0	4.0		3.0	3.0		3.0	4.0			3.0
Lane Grp Cap (vph)		113	128		121	137		33	2093			107
v/s Ratio Prot						0.00		0.01	0.21			c0.04
v/s Ratio Perm		0.02	0.00		c0.06							
v/c Ratio		0.22	0.02		0.58	0.03		0.30	0.32			0.61
Uniform Delay, d1		60.4	59.2		62.6	59.2		70.0	10.8			65.9
Progression Factor		1.00	1.00		1.00	1.00		0.80	1.71			1.15
Incremental Delay, d2		1.4	0.1		6.6	0.1		5.1	0.4			7.0
Delay (s)		61.7	59.3		69.2	59.3		60.7	18.9			83.0
Level of Service		E	E		E	E		E	B			F
Approach Delay (s)		60.5				65.6			19.5			
Approach LOS		E				E			B			

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR	SBR2
Lane Configurations			
Traffic Volume (vph)	1110	180	15
Future Volume (vph)	1110	180	15
Ideal Flow (vphpl)	1750	1750	1750
Grade (%)	0%		
Total Lost time (s)	10.0	10.0	
Lane Util. Factor	0.95	1.00	
Frpb, ped/bikes	1.00	0.96	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	1.00	1.00	
Satd. Flow (prot)	3292	1410	
Flt Permitted	1.00	1.00	
Satd. Flow (perm)	3292	1410	
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1110	180	15
RTOR Reduction (vph)	0	29	0
Lane Group Flow (vph)	1110	166	0
Confl. Peds. (#/hr)			6
Heavy Vehicles (%)	1%	1%	1%
Turn Type	NA	Perm	
Protected Phases	6		
Permitted Phases		6	
Actuated Green, G (s)	101.9	101.9	
Effective Green, g (s)	101.9	101.9	
Actuated g/C Ratio	0.70	0.70	
Clearance Time (s)	10.0	10.0	
Vehicle Extension (s)	4.0	4.0	
Lane Grp Cap (vph)	2313	990	
v/s Ratio Prot	c0.34		
v/s Ratio Perm		0.12	
v/c Ratio	0.48	0.17	
Uniform Delay, d1	9.7	7.3	
Progression Factor	0.81	0.70	
Incremental Delay, d2	0.5	0.3	
Delay (s)	8.4	5.4	
Level of Service	A	A	
Approach Delay (s)	11.5		
Approach LOS	B		

Intersection Summary

Movement	EBL	EBT	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	75	5	30	10	10	35	30	10	520	5	65	20
Future Volume (vph)	75	5	30	10	10	35	30	10	520	5	65	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	11.0	11.0		11.0	11.0			5.0	10.0			5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95			1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00			1.00
Flpb, ped/bikes	0.99	1.00		0.97	1.00			1.00	1.00			1.00
Frt	1.00	0.87		1.00	0.88			1.00	1.00			1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)	1589	1466		1586	1494			1599	3191			1630
Flt Permitted	0.73	1.00		0.73	1.00			0.95	1.00			0.95
Satd. Flow (perm)	1217	1466		1226	1494			1599	3191			1630
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	5	30	10	10	35	30	10	520	5	65	20
RTOR Reduction (vph)	0	31	0	0	31	0	0	0	0	0	0	0
Lane Group Flow (vph)	75	4	0	10	14	0	0	40	525	0	0	85
Confl. Peds. (#/hr)	4			18		4		8		4		4
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	4%	2%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)	17.9	17.9		17.9	17.9			7.9	87.9			13.2
Effective Green, g (s)	17.9	17.9		17.9	17.9			7.9	87.9			13.2
Actuated g/C Ratio	0.12	0.12		0.12	0.12			0.05	0.61			0.09
Clearance Time (s)	11.0	11.0		11.0	11.0			5.0	10.0			5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0			4.0
Lane Grp Cap (vph)	150	180		151	184			87	1934			148
v/s Ratio Prot		0.00			0.01			0.03	0.16			c0.05
v/s Ratio Perm	c0.06			0.01								
v/c Ratio	0.50	0.02		0.07	0.08			0.46	0.27			0.57
Uniform Delay, d1	59.4	55.9		56.2	56.2			66.5	13.5			63.2
Progression Factor	1.00	1.00		1.00	1.00			1.38	0.25			1.15
Incremental Delay, d2	2.6	0.1		0.2	0.2			3.5	0.3			6.0
Delay (s)	62.0	55.9		56.3	56.4			95.4	3.7			79.0
Level of Service	E	E		E	E			F	A			E
Approach Delay (s)		60.1			56.4				10.2			
Approach LOS		E			E				B			

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

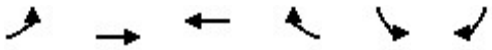
Movement	SBT	SBR	SBR2
Lane Configurations			
Traffic Volume (vph)	1045	170	60
Future Volume (vph)	1045	170	60
Ideal Flow (vphpl)	1750	1750	1750
Total Lost time (s)	10.0	10.0	
Lane Util. Factor	0.95	1.00	
Frpb, ped/bikes	1.00	0.95	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	1.00	1.00	
Satd. Flow (prot)	3260	1385	
Flt Permitted	1.00	1.00	
Satd. Flow (perm)	3260	1385	
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1045	170	60
RTOR Reduction (vph)	0	35	0
Lane Group Flow (vph)	1045	195	0
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			1
Heavy Vehicles (%)	2%	2%	2%
Turn Type	NA	Perm	
Protected Phases	6		
Permitted Phases		6	
Actuated Green, G (s)	93.2	93.2	
Effective Green, g (s)	93.2	93.2	
Actuated g/C Ratio	0.64	0.64	
Clearance Time (s)	10.0	10.0	
Vehicle Extension (s)	4.0	4.0	
Lane Grp Cap (vph)	2095	890	
v/s Ratio Prot	c0.32		
v/s Ratio Perm		0.14	
v/c Ratio	0.50	0.22	
Uniform Delay, d1	13.6	10.8	
Progression Factor	0.93	0.77	
Incremental Delay, d2	0.8	0.5	
Delay (s)	13.5	8.8	
Level of Service	B	A	
Approach Delay (s)	16.8		
Approach LOS	B		

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	255	60	335	135	775	370
Future Volume (vph)	255	60	335	135	775	370
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.5		5.0	5.0	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.96		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1584		1630	1716	1733	1473
Flt Permitted	0.96		0.08	1.00	1.00	1.00
Satd. Flow (perm)	1584		131	1716	1733	1473
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	255	60	335	135	775	370
RTOR Reduction (vph)	9	0	0	0	0	32
Lane Group Flow (vph)	306	0	335	135	775	338
Confl. Peds. (#/hr)		2				1
Heavy Vehicles (%)	3%	3%	2%	2%	1%	1%
Turn Type	Prot		pm+pt	NA	NA	pt+ov
Protected Phases	4		5	2	6	6 4
Permitted Phases			2			
Actuated Green, G (s)	23.2		70.0	70.0	48.0	76.2
Effective Green, g (s)	23.2		70.0	70.0	48.0	76.2
Actuated g/C Ratio	0.22		0.68	0.68	0.46	0.73
Clearance Time (s)	5.5		5.0	5.0	5.0	
Vehicle Extension (s)	4.0		3.5	4.0	4.0	
Lane Grp Cap (vph)	354		334	1158	802	1082
v/s Ratio Prot	c0.19		c0.16	0.08	0.45	0.23
v/s Ratio Perm			c0.51			
v/c Ratio	0.87		1.00	0.12	0.97	0.31
Uniform Delay, d1	38.8		33.8	5.9	27.1	4.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	19.8		50.0	0.1	23.7	0.2
Delay (s)	58.6		83.8	6.0	50.8	5.0
Level of Service	E		F	A	D	A
Approach Delay (s)	58.6			61.4	36.0	
Approach LOS	E			E	D	

Intersection Summary			
HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	103.7	Sum of lost time (s)	15.5
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

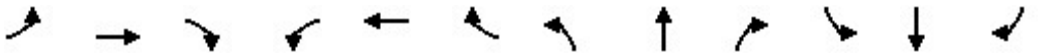
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	830	410	390	705	20
Future Volume (vph)	30	830	410	390	705	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.2	6.2	6.2	6.2	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.97	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	
Frt	1.00	1.00	1.00	0.85	1.00	
Flt Protected	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (prot)	1646	3292	1699	1444	3139	
Flt Permitted	0.47	1.00	1.00	1.00	0.95	
Satd. Flow (perm)	817	3292	1699	1444	3139	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	830	410	390	705	20
RTOR Reduction (vph)	0	0	0	224	3	0
Lane Group Flow (vph)	30	830	410	166	722	0
Confl. Peds. (#/hr)					4	4
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		6	2			
Permitted Phases	6			2	4	
Actuated Green, G (s)	20.7	20.7	20.7	20.7	15.4	
Effective Green, g (s)	20.7	20.7	20.7	20.7	15.4	
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.32	
Clearance Time (s)	6.2	6.2	6.2	6.2	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	0.2	
Lane Grp Cap (vph)	348	1405	725	616	996	
v/s Ratio Prot		c0.25	0.24			
v/s Ratio Perm	0.04			0.12	c0.23	
v/c Ratio	0.09	0.59	0.57	0.27	0.73	
Uniform Delay, d1	8.3	10.7	10.5	9.0	14.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.7	1.0	0.2	2.2	
Delay (s)	8.4	11.3	11.5	9.2	16.9	
Level of Service	A	B	B	A	B	
Approach Delay (s)		11.2	10.4		16.9	
Approach LOS		B	B		B	

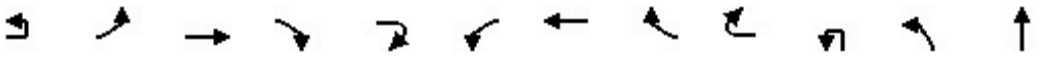
Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	48.5	Sum of lost time (s)	12.4
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	320	70	125	295	80	60	90	95	390	470	205
Future Volume (vph)	45	320	70	125	295	80	60	90	95	390	470	205
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.5	6.1		5.5	6.1		5.5	5.9		5.5	5.9	5.9
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	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	0.97		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1627	3153		1627	3141		1610	1552		1625	1716	1421
Flt Permitted	0.42	1.00		0.30	1.00		0.43	1.00		0.57	1.00	1.00
Satd. Flow (perm)	713	3153		518	3141		730	1552		978	1716	1421
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	320	70	125	295	80	60	90	95	390	470	205
RTOR Reduction (vph)	0	18	0	0	23	0	0	19	0	0	0	77
Lane Group Flow (vph)	45	372	0	125	352	0	60	166	0	390	470	128
Confl. Peds. (#/hr)	7		5	5		7	9		6	6		9
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	31.8	24.5		37.0	27.1		74.4	67.6		88.1	75.8	75.8
Effective Green, g (s)	31.8	24.5		37.0	27.1		74.4	67.6		88.1	75.8	75.8
Actuated g/C Ratio	0.23	0.18		0.26	0.19		0.53	0.48		0.63	0.54	0.54
Clearance Time (s)	5.5	6.1		5.5	6.1		5.5	5.9		5.5	5.9	5.9
Vehicle Extension (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	4.0
Lane Grp Cap (vph)	209	551		215	608		430	749		684	929	769
v/s Ratio Prot	0.01	c0.12		c0.04	0.11		0.01	0.11		c0.06	0.27	
v/s Ratio Perm	0.04			c0.11			0.07			c0.30		0.09
v/c Ratio	0.22	0.67		0.58	0.58		0.14	0.22		0.57	0.51	0.17
Uniform Delay, d1	43.1	54.0		41.6	51.3		16.2	21.0		13.4	20.3	16.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	3.6		4.2	1.6		0.2	0.7		1.2	2.0	0.5
Delay (s)	43.7	57.6		45.8	52.9		16.4	21.6		14.6	22.2	16.6
Level of Service	D	E		D	D		B	C		B	C	B
Approach Delay (s)		56.2			51.1			20.4			18.4	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBU	EBL2	EBT	EBR	EBR2	WBL2	WBT	WBR	WBR2	NBU	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	70	100	340	0	340	130	255	0	120	15	110	375
Future Volume (vph)	70	100	340	0	340	130	255	0	120	15	110	375
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	11	14	12	13	11	14	12	12	13	11
Total Lost time (s)		6.0	10.0	10.0		6.0	10.0	10.0			6.0	10.7
Lane Util. Factor		1.00	1.00	1.00		1.00	1.00	1.00			1.00	0.95
Frpb, ped/bikes		1.00	1.00	0.96		1.00	1.00	0.91			1.00	1.00
Flpb, ped/bikes		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	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)		1646	1675	1508		1684	1658	1416			1668	3121
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00			0.95	1.00
Satd. Flow (perm)		1646	1675	1508		1684	1658	1416			1668	3121
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	100	340	0	340	130	255	0	120	15	110	375
RTOR Reduction (vph)	0	0	0	254	0	0	0	91	0	0	0	0
Lane Group Flow (vph)	0	170	340	86	0	130	255	29	0	0	125	375
Confl. Peds. (#/hr)		33		23		23		33			28	
Confl. Bikes (#/hr)								1	1			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	2%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm		Prot	NA	Perm		Prot	Prot	NA
Protected Phases	7	7	4			3	8			5	5	2
Permitted Phases				4				8				
Actuated Green, G (s)		16.0	36.7	36.7		14.3	35.0	35.0			12.0	25.6
Effective Green, g (s)		16.0	36.7	36.7		14.3	35.0	35.0			12.0	25.6
Actuated g/C Ratio		0.11	0.25	0.25		0.10	0.24	0.24			0.08	0.18
Clearance Time (s)		6.0	10.0	10.0		6.0	10.0	10.0			6.0	10.7
Vehicle Extension (s)		3.5	4.0	4.0		3.5	4.0	4.0			3.5	4.0
Lane Grp Cap (vph)		181	423	381		166	400	341			138	551
v/s Ratio Prot		c0.10	c0.20			0.08	c0.15				c0.07	0.12
v/s Ratio Perm				0.06				0.02				
v/c Ratio		0.94	0.80	0.23		0.78	0.64	0.08			0.91	0.68
Uniform Delay, d1		64.0	50.8	42.9		63.8	49.3	42.6			65.9	55.9
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00			0.85	0.74
Incremental Delay, d2		49.4	11.1	0.4		21.6	3.7	0.1			48.5	6.4
Delay (s)		113.4	61.9	43.3		85.4	53.0	42.7			104.8	47.7
Level of Service		F	E	D		F	D	D			F	D
Approach Delay (s)			64.8				58.9					59.6
Approach LOS			E				E					E

Intersection Summary			
HCM 2000 Control Delay	66.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	32.7
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR	NBR2	SBU	SBL	SBT	SBR	SBR2
Lane Configurations							
Traffic Volume (vph)	25	110	30	160	995	165	55
Future Volume (vph)	25	110	30	160	995	165	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	13	12	12	12	12	14
Total Lost time (s)	10.7			6.0	10.7	10.7	
Lane Util. Factor	1.00			1.00	0.95	1.00	
Frpb, ped/bikes	0.91			1.00	1.00	0.95	
Flpb, ped/bikes	1.00			1.00	1.00	1.00	
Frt	0.85			1.00	1.00	0.85	
Flt Protected	1.00			0.95	1.00	1.00	
Satd. Flow (prot)	1320			1646	3292	1397	
Flt Permitted	1.00			0.95	1.00	1.00	
Satd. Flow (perm)	1320			1646	3292	1397	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	110	30	160	995	165	55
RTOR Reduction (vph)	111	0	0	0	0	144	0
Lane Group Flow (vph)	24	0	0	190	995	76	0
Confl. Peds. (#/hr)		28		28			28
Confl. Bikes (#/hr)							
Heavy Vehicles (%)	3%	3%	1%	1%	1%	1%	1%
Turn Type	Perm		Prot	Prot	NA	Perm	
Protected Phases			1	1	6		
Permitted Phases	2					6	
Actuated Green, G (s)	25.6			35.7	49.3	49.3	
Effective Green, g (s)	25.6			35.7	49.3	49.3	
Actuated g/C Ratio	0.18			0.25	0.34	0.34	
Clearance Time (s)	10.7			6.0	10.7	10.7	
Vehicle Extension (s)	4.0			3.5	4.0	4.0	
Lane Grp Cap (vph)	233			405	1119	474	
v/s Ratio Prot				0.12	c0.30		
v/s Ratio Perm	0.02					0.05	
v/c Ratio	0.10			0.47	0.89	0.16	
Uniform Delay, d1	50.1			46.6	45.3	33.4	
Progression Factor	1.00			1.20	1.19	4.00	
Incremental Delay, d2	0.8			1.0	10.1	0.7	
Delay (s)	50.9			56.8	64.1	134.2	
Level of Service	D			E	E	F	
Approach Delay (s)					74.1		
Approach LOS					E		

Intersection Summary

Movement	EBL2	EBL	EBT	EBR2	WBL2	WBT	WBR2	NBU	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	30	5	30	35	80	10	50	15	15	575	40	45
Future Volume (vph)	30	5	30	35	80	10	50	15	15	575	40	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	14	12	12	14	12	12	13	11	12	14
Total Lost time (s)			5.9			5.9			5.5	6.7	6.7	
Lane Util. Factor			1.00			1.00			1.00	0.95	1.00	
Frpb, ped/bikes			1.00			1.00			1.00	1.00	0.94	
Flpb, ped/bikes			1.00			1.00			1.00	1.00	1.00	
Frt			0.95			0.95			1.00	1.00	0.85	
Flt Protected			0.98			0.97			0.95	1.00	1.00	
Satd. Flow (prot)			1728			1677			1652	3091	1343	
Flt Permitted			0.83			0.52			0.95	1.00	1.00	
Satd. Flow (perm)			1455			899			1652	3091	1343	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	5	30	35	80	10	50	15	15	575	40	45
RTOR Reduction (vph)	0	0	88	0	0	129	0	0	0	0	35	0
Lane Group Flow (vph)	0	0	12	0	0	11	0	0	30	575	50	0
Confl. Peds. (#/hr)		2							4		11	
Heavy Vehicles (%)	1%	1%	1%	1%	3%	3%	3%	4%	4%	4%	4%	4%
Turn Type	Perm	Perm	NA		Perm	NA		Prot	Prot	NA	Perm	
Protected Phases			4			3		5	5	2		
Permitted Phases	4	4			3						2	
Actuated Green, G (s)			16.9			11.3			5.1	85.3	85.3	
Effective Green, g (s)			16.9			11.3			5.1	85.3	85.3	
Actuated g/C Ratio			0.12			0.08			0.04	0.59	0.59	
Clearance Time (s)			5.9			5.9			5.5	6.7	6.7	
Vehicle Extension (s)			3.0			3.0			2.5	4.0	4.0	
Lane Grp Cap (vph)			169			70			58	1818	790	
v/s Ratio Prot									c0.02	0.19		
v/s Ratio Perm			c0.01			c0.01					0.04	
v/c Ratio			0.07			0.16			0.52	0.32	0.06	
Uniform Delay, d1			57.0			62.4			68.7	15.1	12.8	
Progression Factor			1.00			1.00			1.41	1.73	6.74	
Incremental Delay, d2			0.2			1.0			5.6	0.4	0.2	
Delay (s)			57.2			63.4			102.4	26.6	86.2	
Level of Service			E			E			F	C	F	
Approach Delay (s)			57.2			63.4				37.2		
Approach LOS			E			E				D		

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBU	SBL	SBT	SBR	SBR2
Lane Configurations					
Traffic Volume (vph)	30	35	1385	225	10
Future Volume (vph)	30	35	1385	225	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750
Lane Width	12	12	11	12	14
Total Lost time (s)		5.5	6.7	6.7	
Lane Util. Factor		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	
Satd. Flow (prot)		1630	3151	1409	
Flt Permitted		0.95	1.00	1.00	
Satd. Flow (perm)		1630	3151	1409	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	35	1385	225	10
RTOR Reduction (vph)	0	0	0	46	0
Lane Group Flow (vph)	0	65	1385	189	0
Confl. Peds. (#/hr)		11		4	
Heavy Vehicles (%)	2%	2%	2%	2%	2%
Turn Type	Prot	Prot	NA	Perm	
Protected Phases	1	1	6		
Permitted Phases				6	
Actuated Green, G (s)		7.5	87.7	87.7	
Effective Green, g (s)		7.5	87.7	87.7	
Actuated g/C Ratio		0.05	0.60	0.60	
Clearance Time (s)		5.5	6.7	6.7	
Vehicle Extension (s)		2.5	4.0	4.0	
Lane Grp Cap (vph)		84	1905	852	
v/s Ratio Prot		0.04	c0.44		
v/s Ratio Perm				0.13	
v/c Ratio		0.77	0.73	0.22	
Uniform Delay, d1		67.9	20.2	13.1	
Progression Factor		0.94	0.98	0.97	
Incremental Delay, d2		28.6	2.0	0.5	
Delay (s)		92.3	21.9	13.2	
Level of Service		F	C	B	
Approach Delay (s)			23.4		
Approach LOS			C		

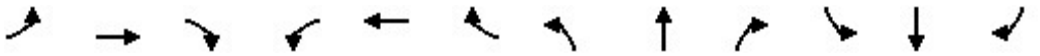
Intersection Summary

Movement	EBL2	EBT	EBR2	WBL2	WBT	WBR2	NBU	NBL	NBT	NBR	NBR2	SBU
Lane Configurations												
Traffic Volume (vph)	35	25	70	55	20	50	45	60	530	35	50	10
Future Volume (vph)	35	25	70	55	20	50	45	60	530	35	50	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	11	11	12	11	11	12	12	12	11	12	14	12
Total Lost time (s)	6.8	6.8		6.8	6.8			5.5	6.7	6.7		
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95	1.00		
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	0.95		
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		
Frt	1.00	0.89		1.00	0.89			1.00	1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		
Satd. Flow (prot)	1576	1475		1591	1495			1614	3121	1368		
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		
Satd. Flow (perm)	1576	1475		1591	1495			1614	3121	1368		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	25	70	55	20	50	45	60	530	35	50	10
RTOR Reduction (vph)	0	87	0	0	64	0	0	0	0	47	0	0
Lane Group Flow (vph)	35	8	0	55	6	0	0	105	530	38	0	0
Confl. Peds. (#/hr)								3		12		
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	3%	3%	1%
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm		Prot
Protected Phases	7	4		3	8		5	5	2			1
Permitted Phases										2		
Actuated Green, G (s)	7.4	11.8		8.0	12.4			12.0	64.9	64.9		
Effective Green, g (s)	7.4	11.8		8.0	12.4			12.0	64.9	64.9		
Actuated g/C Ratio	0.05	0.08		0.06	0.09			0.08	0.45	0.45		
Clearance Time (s)	6.8	6.8		6.8	6.8			5.5	6.7	6.7		
Vehicle Extension (s)	3.5	3.5		3.5	3.5			3.5	4.0	4.0		
Lane Grp Cap (vph)	80	120		87	127			133	1396	612		
v/s Ratio Prot	0.02	c0.01		c0.03	0.00			c0.07	0.17			
v/s Ratio Perm										0.03		
v/c Ratio	0.44	0.06		0.63	0.05			0.79	0.38	0.06		
Uniform Delay, d1	66.8	61.5		67.1	60.9			65.3	26.7	22.8		
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		
Incremental Delay, d2	4.5	0.3		14.6	0.2			26.6	0.8	0.2		
Delay (s)	71.3	61.8		81.7	61.1			91.9	27.4	23.0		
Level of Service	E	E		F	E			F	C	C		
Approach Delay (s)		64.3			70.1				36.3			
Approach LOS		E			E				D			

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Traffic Volume (vph)	55	1470	240	50
Future Volume (vph)	55	1470	240	50
Ideal Flow (vphpl)	1750	1750	1750	1750
Lane Width	12	11	12	14
Total Lost time (s)	5.5	6.7	6.7	
Lane Util. Factor	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	
Satd. Flow (prot)	1646	3182	1431	
Flt Permitted	0.95	1.00	1.00	
Satd. Flow (perm)	1646	3182	1431	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	55	1470	240	50
RTOR Reduction (vph)	0	0	48	0
Lane Group Flow (vph)	65	1470	242	0
Confl. Peds. (#/hr)	12		3	
Heavy Vehicles (%)	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	
Protected Phases	1	6		
Permitted Phases			6	
Actuated Green, G (s)	34.5	87.4	87.4	
Effective Green, g (s)	34.5	87.4	87.4	
Actuated g/C Ratio	0.24	0.60	0.60	
Clearance Time (s)	5.5	6.7	6.7	
Vehicle Extension (s)	3.5	4.0	4.0	
Lane Grp Cap (vph)	391	1917	862	
v/s Ratio Prot	0.04	c0.46		
v/s Ratio Perm			0.17	
v/c Ratio	0.17	0.77	0.28	
Uniform Delay, d1	43.8	21.3	13.8	
Progression Factor	1.30	1.31	1.94	
Incremental Delay, d2	0.2	2.5	0.7	
Delay (s)	57.4	30.4	27.4	
Level of Service	E	C	C	
Approach Delay (s)		30.9		
Approach LOS		C		

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	375	5	55	425	90	20	20	35	230	75	265
Future Volume (vph)	45	375	5	55	425	90	20	20	35	230	75	265
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.9	5.9		5.9	5.9	5.9		5.9		5.9	5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.94		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)	1643	1729		1630	1716	1424		1585		1646	1499	
Flt Permitted	0.44	1.00		0.49	1.00	1.00		0.86		0.71	1.00	
Satd. Flow (perm)	763	1729		842	1716	1424		1387		1227	1499	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	375	5	55	425	90	20	20	35	230	75	265
RTOR Reduction (vph)	0	1	0	0	0	52	0	23	0	0	117	0
Lane Group Flow (vph)	45	379	0	55	425	38	0	52	0	230	223	0
Confl. Peds. (#/hr)	4					4	7					7
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	20.4	20.4		20.4	20.4	20.4		16.7		16.7	16.7	
Effective Green, g (s)	20.4	20.4		20.4	20.4	20.4		16.7		16.7	16.7	
Actuated g/C Ratio	0.42	0.42		0.42	0.42	0.42		0.34		0.34	0.34	
Clearance Time (s)	5.9	5.9		5.9	5.9	5.9		5.9		5.9	5.9	
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5		3.0		3.5	3.5	
Lane Grp Cap (vph)	318	721		351	715	594		473		419	511	
v/s Ratio Prot		0.22			c0.25						0.15	
v/s Ratio Perm	0.06			0.07		0.03		0.04		c0.19		
v/c Ratio	0.14	0.53		0.16	0.59	0.06		0.11		0.55	0.44	
Uniform Delay, d1	8.8	10.6		8.9	11.0	8.5		11.0		13.0	12.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.8		0.2	1.4	0.1		0.1		1.6	0.7	
Delay (s)	9.1	11.4		9.1	12.5	8.6		11.1		14.7	13.2	
Level of Service	A	B		A	B	A		B		B	B	
Approach Delay (s)		11.2			11.5			11.1			13.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	11.8
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

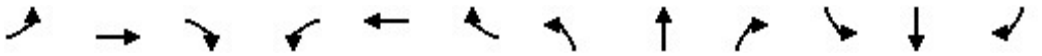
c Critical Lane Group

Movement	EBU	EBL2	EBT	EBR	EBR2	WBU	WBL2	WBT	WBR	WBR2	NBU	NBL
Lane Configurations												
Traffic Volume (vph)	5	45	545	0	155	5	795	460	0	135	55	100
Future Volume (vph)	5	45	545	0	155	5	795	460	0	135	55	100
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	11	14	12	12	12	12	13	12	12	12
Total Lost time (s)		6.0	6.0	6.0			6.0	6.0	6.0			6.5
Lane Util. Factor		1.00	0.95	1.00			0.97	0.95	1.00			0.97
Frpb, ped/bikes		1.00	1.00	0.97			1.00	1.00	0.97			1.00
Flpb, ped/bikes		1.00	1.00	1.00			1.00	1.00	1.00			1.00
Frt		1.00	1.00	0.85			1.00	1.00	0.85			1.00
Flt Protected		0.95	1.00	1.00			0.95	1.00	1.00			0.95
Satd. Flow (prot)		1646	3182	1530			3162	3260	1469			3162
Flt Permitted		0.95	1.00	1.00			0.95	1.00	1.00			0.95
Satd. Flow (perm)		1646	3182	1530			3162	3260	1469			3162
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	45	545	0	155	5	795	460	0	135	55	100
RTOR Reduction (vph)	0	0	0	120	0	0	0	0	78	0	0	0
Lane Group Flow (vph)	0	50	545	35	0	0	800	460	57	0	0	155
Confl. Peds. (#/hr)				13					10			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	Prot	NA	Perm		Prot	Prot	NA	Perm		Prot	Prot
Protected Phases	7	7	4			3	3	8			5	5
Permitted Phases				4					8			
Actuated Green, G (s)		9.6	44.0	44.0			47.4	81.8	81.8			12.7
Effective Green, g (s)		9.6	44.0	44.0			47.4	81.8	81.8			12.7
Actuated g/C Ratio		0.05	0.23	0.23			0.24	0.42	0.42			0.07
Clearance Time (s)		6.0	6.0	6.0			6.0	6.0	6.0			6.5
Vehicle Extension (s)		3.0	3.5	3.5			3.5	3.5	3.5			3.0
Lane Grp Cap (vph)		81	718	345			769	1368	616			206
v/s Ratio Prot		0.03	c0.17				c0.25	0.14				0.05
v/s Ratio Perm				0.02					0.04			
v/c Ratio		0.62	0.76	0.10			1.04	0.34	0.09			0.75
Uniform Delay, d1		90.8	70.4	59.7			73.7	38.2	34.1			89.5
Progression Factor		1.00	1.00	1.00			1.00	1.00	1.00			1.00
Incremental Delay, d2		13.2	4.8	0.2			43.4	0.2	0.1			14.4
Delay (s)		104.0	75.2	59.9			117.1	38.3	34.2			103.9
Level of Service		F	E	E			F	D	C			F
Approach Delay (s)			74.0					83.1				
Approach LOS			E					F				

Intersection Summary			
HCM 2000 Control Delay	95.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	194.8	Sum of lost time (s)	25.3
Intersection Capacity Utilization	127.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBT	NBR	NBR2	SBU	SBL	SBT	SBR	SBR2
Lane Configurations								
Traffic Volume (vph)	310	20	810	20	550	1170	190	45
Future Volume (vph)	310	20	810	20	550	1170	190	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	11	12	13	12	11	11	12	14
Total Lost time (s)	6.8	6.8	6.8		6.5	6.8	6.8	
Lane Util. Factor	0.95	0.88	0.91		0.97	0.95	1.00	
Frpb, ped/bikes	1.00	0.96	0.96		1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.85	0.85		1.00	1.00	0.85	
Flt Protected	1.00	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3151	1230	1315		3087	3182	1426	
Flt Permitted	1.00	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3151	1230	1315		3087	3182	1426	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	20	810	20	550	1170	190	45
RTOR Reduction (vph)	0	300	312	0	0	0	84	0
Lane Group Flow (vph)	310	117	101	0	570	1170	151	0
Confl. Peds. (#/hr)			21					15
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%
Turn Type	NA	Perm	Perm	Prot	Prot	NA	Perm	
Protected Phases	2			1	1	6		
Permitted Phases		2	2				6	
Actuated Green, G (s)	47.5	47.5	47.5		30.6	65.4	65.4	
Effective Green, g (s)	47.5	47.5	47.5		30.6	65.4	65.4	
Actuated g/C Ratio	0.24	0.24	0.24		0.16	0.34	0.34	
Clearance Time (s)	6.8	6.8	6.8		6.5	6.8	6.8	
Vehicle Extension (s)	4.0	4.0	4.0		3.5	4.0	4.0	
Lane Grp Cap (vph)	768	299	320		484	1068	478	
v/s Ratio Prot	0.10				c0.18	c0.37		
v/s Ratio Perm		0.09	0.08				0.11	
v/c Ratio	0.40	0.39	0.31		1.18	1.10	0.32	
Uniform Delay, d1	61.8	61.6	60.3		82.1	64.7	48.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.5	1.2	0.8		99.7	57.4	0.5	
Delay (s)	62.2	62.7	61.1		181.8	122.1	48.6	
Level of Service	E	E	E		F	F	D	
Approach Delay (s)	67.0					130.6		
Approach LOS	E					F		

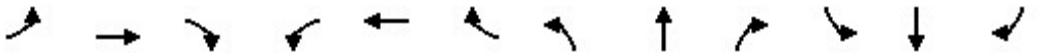
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1305	585	370	820	0	0	0	0	1085	275	590
Future Volume (vph)	0	1305	585	370	820	0	0	0	0	1085	275	590
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.9	5.9	5.5	5.9					5.9	5.9	5.9
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (prot)		3260	1432	3131	3228					1455	2964	2411
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (perm)		3260	1432	3131	3228					1455	2964	2411
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1305	585	370	820	0	0	0	0	1085	275	590
RTOR Reduction (vph)	0	0	160	0	0	0	0	0	0	0	0	182
Lane Group Flow (vph)	0	1305	425	370	820	0	0	0	0	542	818	408
Confl. Peds. (#/hr)	11		3			11	10					10
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		61.9	61.9	18.7	86.1					52.1	52.1	52.1
Effective Green, g (s)		61.9	61.9	18.7	86.1					52.1	52.1	52.1
Actuated g/C Ratio		0.41	0.41	0.12	0.57					0.35	0.35	0.35
Clearance Time (s)		5.9	5.9	5.5	5.9					5.9	5.9	5.9
Vehicle Extension (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
Lane Grp Cap (vph)		1345	590	390	1852					505	1029	837
v/s Ratio Prot		c0.40		c0.12	0.25					c0.37	0.28	
v/s Ratio Perm			0.30									0.17
v/c Ratio		0.97	0.72	0.95	0.44					1.07	1.03dl	0.49
Uniform Delay, d1		43.1	36.8	65.2	18.2					49.0	44.1	38.5
Progression Factor		1.00	1.00	0.86	1.18					0.71	0.71	0.51
Incremental Delay, d2		18.4	7.4	29.1	0.6					58.8	4.0	0.5
Delay (s)		61.5	44.3	85.4	22.1					93.5	35.4	20.1
Level of Service		E	D	F	C					F	D	C
Approach Delay (s)		56.2			41.8			0.0			46.9	
Approach LOS		E			D			A			D	

Intersection Summary			
HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1940	440	0	1040	550	150	330	95	0	0	0
Future Volume (vph)	10	1940	440	0	1040	550	150	330	95	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.2	6.2		6.2	6.2		5.9	5.5			
Lane Util. Factor		0.91	1.00		0.95	1.00		0.95	1.00			
Frpb, ped/bikes		1.00	0.97		1.00	0.99		1.00	1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			
Frt		1.00	0.85		1.00	0.85		1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00		0.98	1.00			
Satd. Flow (prot)		4683	1415		3228	1426		3089	1403			
Flt Permitted		0.93	1.00		1.00	1.00		0.98	1.00			
Satd. Flow (perm)		4363	1415		3228	1426		3089	1403			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	1940	440	0	1040	550	150	330	95	0	0	0
RTOR Reduction (vph)	0	0	125	0	0	191	0	0	74	0	0	0
Lane Group Flow (vph)	0	1950	315	0	1040	359	0	480	21	0	0	0
Confl. Peds. (#/hr)	1		3	3		1						7
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	6%	6%	6%	0%	0%	0%
Turn Type	Perm	NA	Perm		NA	Perm	Split	NA	custom			
Protected Phases		2			6		3	3	1			
Permitted Phases	2		2			6			3			
Actuated Green, G (s)		80.3	80.3		95.8	95.8		23.1	33.1			
Effective Green, g (s)		80.3	80.3		95.8	95.8		23.1	33.1			
Actuated g/C Ratio		0.54	0.54		0.64	0.64		0.15	0.22			
Clearance Time (s)		6.2	6.2		6.2	6.2		5.9	5.5			
Vehicle Extension (s)		4.0	4.0		4.0	4.0		4.0	4.5			
Lane Grp Cap (vph)		2335	757		2061	910		475	309			
v/s Ratio Prot					c0.32			c0.16	0.00			
v/s Ratio Perm		c0.45	0.22			0.25			0.01			
v/c Ratio		0.84	0.42		0.50	0.39		1.01	0.07			
Uniform Delay, d1		29.3	20.8		14.4	13.1		63.5	46.2			
Progression Factor		0.62	0.55		1.00	1.00		1.00	1.00			
Incremental Delay, d2		1.2	0.5		0.9	1.3		43.9	0.2			
Delay (s)		19.3	12.0		15.3	14.4		107.4	46.4			
Level of Service		B	B		B	B		F	D			
Approach Delay (s)		17.9			15.0			97.3			0.0	
Approach LOS		B			B			F			A	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	22.6
Intersection Capacity Utilization	107.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	415	5	185	295	5
Future Volume (Veh/h)	200	415	5	185	295	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	200	415	5	185	295	5
Pedestrians	2				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	790					
pX, platoon unblocked						
vC, conflicting volume			616		398	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			616		398	201
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			99		50	99
cM capacity (veh/h)			949		595	829

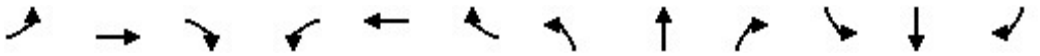
Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	200	415	190	300
Volume Left	0	0	5	295
Volume Right	0	415	0	5
cSH	1700	1700	949	598
Volume to Capacity	0.12	0.24	0.01	0.50
Queue Length 95th (ft)	0	0	0	70
Control Delay (s)	0.0	0.0	0.3	16.9
Lane LOS			A	C
Approach Delay (s)	0.0		0.3	16.9
Approach LOS				C

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	20	490	30	30	630
Future Volume (Veh/h)	15	20	490	30	30	630
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	20	490	30	30	630
Pedestrians	3		1			3
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						506
pX, platoon unblocked	0.88					
vC, conflicting volume	1199	511			523	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1158	511			523	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			97	
cM capacity (veh/h)	186	564			1036	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	35	520	30	630
Volume Left	15	0	30	0
Volume Right	20	30	0	0
cSH	302	1700	1036	1700
Volume to Capacity	0.12	0.31	0.03	0.37
Queue Length 95th (ft)	10	0	2	0
Control Delay (s)	18.5	0.0	8.6	0.0
Lane LOS	C		A	
Approach Delay (s)	18.5	0.0	0.4	
Approach LOS	C			

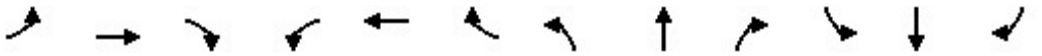
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	10	55	0	75	5	255	10	25	650	15
Future Volume (vph)	25	0	10	55	0	75	5	255	10	25	650	15
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			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.96		1.00	0.85			0.99			1.00	
Flt Protected		0.97		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1562		1662	1488			1704			1674	
Flt Permitted		0.74		0.73	1.00			0.99			0.99	
Satd. Flow (perm)		1198		1285	1488			1688			1652	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	0	10	55	0	75	5	255	10	25	650	15
RTOR Reduction (vph)	0	30	0	0	65	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	5	0	55	10	0	0	268	0	0	689	0
Confl. Peds. (#/hr)									7	7		
Heavy Vehicles (%)	4%	4%	4%	0%	0%	0%	2%	2%	2%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.8		5.8	5.8			27.8			27.8	
Effective Green, g (s)		5.8		5.8	5.8			27.8			27.8	
Actuated g/C Ratio		0.13		0.13	0.13			0.64			0.64	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		159		170	197			1076			1053	
v/s Ratio Prot					0.01							
v/s Ratio Perm		0.00		c0.04				0.16			c0.42	
v/c Ratio		0.03		0.32	0.05			0.25			0.65	
Uniform Delay, d1		16.4		17.1	16.5			3.4			4.9	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		1.1	0.1			0.1			1.5	
Delay (s)		16.5		18.2	16.6			3.5			6.4	
Level of Service		B		B	B			A			A	
Approach Delay (s)		16.5			17.3			3.5			6.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.7%	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)	105	80	5	80	140	130	0	565	75	160	745	630
Future Volume (vph)	105	80	5	80	140	130	0	565	75	160	745	630
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.0	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	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.97
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	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	1731		1630	1716	1458		1699	1444	1630	1716	1414
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1662	1731		1630	1716	1458		1699	1444	364	1716	1414
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	80	5	80	140	130	0	565	75	160	745	630
RTOR Reduction (vph)	0	1	0	0	0	111	0	0	42	0	0	167
Lane Group Flow (vph)	105	84	0	80	140	19	0	565	33	160	745	463
Confl. Peds. (#/hr)			7									5
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm		NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases						8			2	6		6
Actuated Green, G (s)	15.7	20.5		13.8	18.6	18.6		55.1	55.1	73.7	73.7	73.7
Effective Green, g (s)	15.7	20.5		13.8	18.6	18.6		55.1	55.1	73.7	73.7	73.7
Actuated g/C Ratio	0.12	0.16		0.11	0.15	0.15		0.44	0.44	0.58	0.58	0.58
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		5.0	5.0	3.5	5.0	5.0
Lane Grp Cap (vph)	207	281		178	253	215		742	631	339	1003	827
v/s Ratio Prot	c0.06	0.05		0.05	c0.08			0.33		0.05	c0.43	
v/s Ratio Perm						0.01			0.02	0.23		0.33
v/c Ratio	0.51	0.30		0.45	0.55	0.09		0.76	0.05	0.47	0.74	0.56
Uniform Delay, d1	51.5	46.4		52.5	49.8	46.4		29.9	20.4	17.3	19.2	16.1
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	2.7	0.8		2.5	3.2	0.2		5.5	0.1	1.2	3.6	1.4
Delay (s)	54.2	47.2		55.0	53.1	46.6		35.4	20.5	18.5	22.8	17.5
Level of Service	D	D		D	D	D		D	C	B	C	B
Approach Delay (s)		51.1			51.1			33.6			20.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

LANE SUMMARY

Site: 100 [100-102 - Des Moines Way S @ 8th Ave S / S 152nd St (Site Folder: 2032 PA Mit)]

Des Moines Memorial Dr S/8th Ave S/S 152nd St
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Des Moines Way S													
Lane 1[d]	625	2.0	1227	0.509	100	4.4	LOS A	4.0	100.7	Full	1600	0.0	0.0
Approach	625	2.0		0.509		4.4	LOS A	4.0	100.7				
NorthEast: Des Moines Way S													
Lane 1[d]	715	2.0	1164	0.614	100	7.0	LOS A	5.1	129.2	Full	1600	0.0	0.0
Approach	715	2.0		0.614		7.0	LOS A	5.1	129.2				
NorthWest: 8th Ave S													
Lane 1[d]	370	3.0	796	0.465	100	8.9	LOS A	4.1	105.1	Full	1600	0.0	0.0
Lane 2	55	3.0	1318	0.042	9[5]	3.6	LOS A	0.2	5.3	Short	200	0.0	NA
Approach	425	3.0		0.465		8.2	LOS A	4.1	105.1				
West: S 152nd St													
Lane 1[d]	150	3.0	612	0.245	100	11.8	LOS B	1.6	41.0	Full	1600	0.0	0.0
Approach	150	3.0		0.245		11.8	LOS B	1.6	41.0				
Intersection	1915	2.3		0.614		6.8	LOS A	5.1	129.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Des Moines Way S

Mov. From S To Exit:	L2 W	L1 NW	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	170	40	415	625	2.0	1227	0.509	100	NA	NA
Approach	170	40	415	625	2.0		0.509			

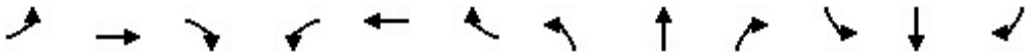
NorthEast: Des Moines Way S

Mov. From NE To Exit:	L1 S	R1 W	R2 NW	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	115	65	25	100	65	10
Future Volume (Veh/h)	115	65	25	100	65	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	115	65	25	100	65	10
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1236		
pX, platoon unblocked						
vC, conflicting volume			185		308	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			185		308	158
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		90	99
cM capacity (veh/h)			1354		662	875

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	180	125	75
Volume Left	0	25	65
Volume Right	65	0	10
cSH	1700	1354	685
Volume to Capacity	0.11	0.02	0.11
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	1.7	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	1.7	10.9
Approach LOS			B

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	34.6%	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 (veh/h)	5	110	20	75	105	5	25	5	75	5	5	5
Future Volume (Veh/h)	5	110	20	75	105	5	25	5	75	5	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	110	20	75	105	5	25	5	75	5	5	5
Pedestrians		2			5			3			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					726							
pX, platoon unblocked												
vC, conflicting volume	114			133			400	397	128	474	404	114
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			133			400	397	128	474	404	114
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 %	100			95			95	99	92	99	99	99
cM capacity (veh/h)	1470			1448			522	505	911	435	506	940

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	135	185	105	15
Volume Left	5	75	25	5
Volume Right	20	5	75	5
cSH	1470	1448	749	562
Volume to Capacity	0.00	0.05	0.14	0.03
Queue Length 95th (ft)	0	4	12	2
Control Delay (s)	0.3	3.3	10.6	11.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.3	3.3	10.6	11.6
Approach LOS			B	B

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	38.8%	ICU Level of Service	A	
Analysis Period (min)	15			

LANE SUMMARY

Site: 105 [105-S 160th St @ 34th Ave S (Site Folder: 2032 PA Mit)]

S 160th St @ 34th Ave S
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: 34th Ave S													
Lane 1[d]	330	0.0	1003	0.329	100	7.8	LOS A	1.9	48.4	Full	1600	0.0	0.0
Approach	330	0.0		0.329		7.8	LOS A	1.9	48.4				
East: S 160th St													
Lane 1	184	3.0	1122	0.164	100	4.8	LOS A	0.9	23.7	Full	1600	0.0	0.0
Lane 2[d]	216	3.0	1313	0.164	100	3.0	LOS A	1.0	24.6	Full	1600	0.0	0.0
Approach	400	3.0		0.164		3.8	LOS A	1.0	24.6				
North: 34th Ave S													
Lane 1[d]	30	0.0	903	0.033	100	5.3	LOS A	0.1	2.8	Full	1600	0.0	0.0
Approach	30	0.0		0.033		5.3	LOS A	0.1	2.8				
West: S 160th St													
Lane 1[d]	475	3.0	1312	0.362	100	2.6	LOS A	2.0	50.8	Full	1600	0.0	0.0
Lane 2	200	3.0	1036	0.193	100	3.1	LOS A	0.8	21.7	Full	1600	0.0	0.0
Approach	675	3.0		0.362		2.8	LOS A	2.0	50.8				
Intersection	1435	2.2		0.362		4.3	LOS A	2.0	50.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: 34th Ave S

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	200	50	80	330	0.0	1003	0.329	100	NA	NA
Approach	200	50	80	330	0.0		0.329			

East: S 160th St

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

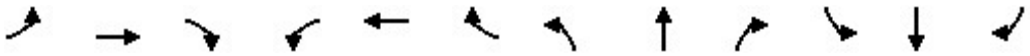
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	35	55	15	20	50	75	20	30	20	170	180	40
Future Volume (vph)	35	55	15	20	50	75	20	30	20	170	180	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)			5.0			5.0			5.0	5.0	5.0	
Lane Util. Factor			1.00			1.00			1.00	1.00	1.00	
Frpb, ped/bikes			0.99			0.99			1.00	1.00	0.96	
Flpb, ped/bikes			0.99			1.00			1.00	1.00	1.00	
Frt			0.98			0.96			1.00	1.00	0.85	
Flt Protected			0.97			0.99			0.95	1.00	1.00	
Satd. Flow (prot)			1624			1600			1612	1699	1382	
Flt Permitted			0.54			0.88			0.25	1.00	1.00	
Satd. Flow (perm)			901			1431			426	1699	1382	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	55	15	20	50	75	20	30	20	170	180	40
RTOR Reduction (vph)	0	0	5	0	0	5	0	0	0	0	67	0
Lane Group Flow (vph)	0	0	120	0	0	170	0	0	20	170	153	0
Confl. Peds. (#/hr)	7	5		5	5		7	5	6		5	2
Heavy Vehicles (%)	0%	0%	0%	0%	2%	2%	2%	2%	3%	3%	3%	3%
Turn Type	Perm	Perm	NA		Perm	NA			pm+pt	NA	Perm	
Protected Phases			4			4			1	6		
Permitted Phases	4	4			4				6		6	
Actuated Green, G (s)			20.8			20.8			33.1	29.3	29.3	
Effective Green, g (s)			20.8			20.8			33.1	29.3	29.3	
Actuated g/C Ratio			0.16			0.16			0.26	0.23	0.23	
Clearance Time (s)			5.0			5.0			5.0	5.0	5.0	
Vehicle Extension (s)			3.0			3.0			3.0	3.0	3.0	
Lane Grp Cap (vph)			148			236			147	394	321	
v/s Ratio Prot									0.00	0.10		
v/s Ratio Perm			c0.13			0.12			0.03		0.11	
v/c Ratio			0.81			0.72			0.14	0.43	0.48	
Uniform Delay, d1			50.8			49.9			35.7	41.3	41.8	
Progression Factor			1.00			1.00			1.00	1.00	1.00	
Incremental Delay, d2			27.4			10.3			0.4	0.8	1.1	
Delay (s)			78.2			60.2			36.1	42.1	42.9	
Level of Service			E			E			D	D	D	
Approach Delay (s)			78.2			60.2				42.2		
Approach LOS			E			E				D		

Intersection Summary			
HCM 2000 Control Delay	70.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	126.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Lane Configurations								
Traffic Volume (vph)	25	75	340	60	115	550	25	20
Future Volume (vph)	25	75	340	60	115	550	25	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0			5.0	5.0	
Lane Util. Factor		1.00	1.00			1.00	1.00	
Frpb, ped/bikes		1.00	0.99			1.00	1.00	
Flpb, ped/bikes		0.99	1.00			1.00	1.00	
Frt		1.00	0.98			1.00	0.85	
Flt Protected		0.95	1.00			0.95	1.00	
Satd. Flow (prot)		1605	1651			1646	1473	
Flt Permitted		0.46	1.00			0.95	1.00	
Satd. Flow (perm)		774	1651			1646	1473	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	75	340	60	115	550	25	20
RTOR Reduction (vph)	0	0	4	0	0	0	28	0
Lane Group Flow (vph)	0	100	396	0	0	665	17	0
Confl. Peds. (#/hr)	5	2		6				
Heavy Vehicles (%)	3%	3%	3%	3%	1%	1%	1%	1%
Turn Type	pm+pt	pm+pt	NA		Prot	Prot	Perm	
Protected Phases	5	5	2		8	8		
Permitted Phases	2	2					8	
Actuated Green, G (s)		43.8	35.0			46.5	46.5	
Effective Green, g (s)		43.8	35.0			46.5	46.5	
Actuated g/C Ratio		0.35	0.28			0.37	0.37	
Clearance Time (s)		5.0	5.0			5.0	5.0	
Vehicle Extension (s)		3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		331	458			606	543	
v/s Ratio Prot		c0.02	c0.24			c0.40		
v/s Ratio Perm		0.08					0.01	
v/c Ratio		0.30	0.86			1.10	0.03	
Uniform Delay, d1		29.1	43.3			39.8	25.4	
Progression Factor		1.00	1.00			1.00	1.00	
Incremental Delay, d2		0.5	15.5			66.0	0.0	
Delay (s)		29.6	58.7			105.8	25.4	
Level of Service		C	E			F	C	
Approach Delay (s)			52.9			100.7		
Approach LOS			D			F		

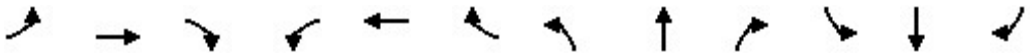
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	40	195	60	50	210	20	105	330	60	15	190	50
Future Volume (vph)	40	195	60	50	210	20	105	330	60	15	190	50
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	195	60	50	210	20	105	330	60	15	190	50

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	295	280	495	255
Volume Left (vph)	40	50	105	15
Volume Right (vph)	60	20	60	50
Hadj (s)	-0.06	0.04	-0.01	-0.05
Departure Headway (s)	7.5	7.6	6.9	7.5
Degree Utilization, x	0.61	0.59	0.94	0.53
Capacity (veh/h)	458	440	517	445
Control Delay (s)	21.7	21.2	52.8	18.8
Approach Delay (s)	21.7	21.2	52.8	18.8
Approach LOS	C	C	F	C

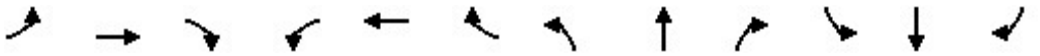
Intersection Summary				
Delay	32.6			
Level of Service	D			
Intersection Capacity Utilization	78.2%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	1035	40	65	315	15	5	20	85	15	15	10
Future Volume (vph)	25	1035	40	65	315	15	5	20	85	15	15	10
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			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.90			0.97	
Flt Protected		1.00			0.99			1.00			0.98	
Satd. Flow (prot)		3204			3119			1533			1590	
Flt Permitted		0.94			0.74			0.98			0.84	
Satd. Flow (perm)		3022			2337			1512			1365	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	1035	40	65	315	15	5	20	85	15	15	10
RTOR Reduction (vph)	0	2	0	0	2	0	0	56	0	0	8	0
Lane Group Flow (vph)	0	1098	0	0	393	0	0	54	0	0	32	0
Confl. Peds. (#/hr)	6		4	4		6	5					5
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		28.1			28.1			7.5			7.5	
Effective Green, g (s)		28.1			28.1			7.5			7.5	
Actuated g/C Ratio		0.62			0.62			0.16			0.16	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1862			1440			248			224	
v/s Ratio Prot												
v/s Ratio Perm		c0.36			0.17			c0.04			0.02	
v/c Ratio		0.59			0.27			0.22			0.14	
Uniform Delay, d1		5.3			4.0			16.5			16.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			0.0			0.2			0.1	
Delay (s)		5.6			4.1			16.7			16.4	
Level of Service		A			A			B			B	
Approach Delay (s)		5.6			4.1			16.7			16.4	
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	0.51		
Actuated Cycle Length (s)	45.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.0%	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)	200	275	295	70	230	25	95	200	30	25	600	140
Future Volume (vph)	200	275	295	70	230	25	95	200	30	25	600	140
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	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		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)	1630	1716	1458	1646	1707		1614	1666		1630	1667	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1630	1716	1458	1646	1707		1614	1666		1630	1667	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	275	295	70	230	25	95	200	30	25	600	140
RTOR Reduction (vph)	0	0	215	0	3	0	0	4	0	0	7	0
Lane Group Flow (vph)	200	275	80	70	252	0	95	226	0	25	733	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)	19.0	32.0	32.0	8.3	21.3		10.0	56.2		5.6	51.8	
Effective Green, g (s)	19.0	32.0	32.0	8.3	21.3		10.0	56.2		5.6	51.8	
Actuated g/C Ratio	0.16	0.27	0.27	0.07	0.18		0.08	0.48		0.05	0.44	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	262	464	395	115	307		136	792		77	731	
v/s Ratio Prot	c0.12	0.16		0.04	c0.15		c0.06	0.14		0.02	c0.44	
v/s Ratio Perm			0.05									
v/c Ratio	0.76	0.59	0.20	0.61	0.82		0.70	0.29		0.32	1.00	
Uniform Delay, d1	47.4	37.4	33.2	53.3	46.6		52.6	18.8		54.4	33.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.1	2.4	0.3	10.1	16.3		18.1	0.4		5.1	34.0	
Delay (s)	60.5	39.8	33.6	63.5	62.9		70.7	19.2		59.5	67.2	
Level of Service	E	D	C	E	E		E	B		E	E	
Approach Delay (s)		42.8			63.0			34.2			66.9	
Approach LOS		D			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	53.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	118.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	120	570	125	0	1360
Future Volume (Veh/h)	0	120	570	125	0	1360
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	120	570	125	0	1360
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			587			739
pX, platoon unblocked	0.88	0.93			0.93	
vC, conflicting volume	1312	348			695	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	747	154			527	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	85			100	
cM capacity (veh/h)	308	805			966	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	120	380	315	680	680
Volume Left	0	0	0	0	0
Volume Right	120	0	125	0	0
cSH	805	1700	1700	1700	1700
Volume to Capacity	0.15	0.22	0.19	0.40	0.40
Queue Length 95th (ft)	13	0	0	0	0
Control Delay (s)	10.3	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.3	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

LANE SUMMARY

Site: 112 [112-S 170th St @ Terminal RAB (Site Folder: 2032 PA)]

New Site
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: S 170th St (WB)													
Lane 1[d]	371	3.0	1679	0.221	100	7.8	LOS A	1.4	35.9	Full	600	0.0	0.0
Lane 2	53	3.0	1193	0.044	20[6]	4.1	LOS A	0.2	5.8	Full	600	0.0	0.0
Approach	424	3.0		0.221		7.4	LOS A	1.4	35.9				
West: S 170th St (EB)													
Lane 1[d]	103	3.0	1180	0.088	100	5.3	LOS A	0.4	11.1	Full	1600	0.0	0.0
Approach	103	3.0		0.088		5.3	LOS A	0.4	11.1				
Intersection	527	3.0		0.221		6.9	LOS A	1.4	35.9				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

East: S 170th St (WB)

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	245	16	110	371	3.0	1679	0.221	100	NA	NA
Lane 2	-	-	53	53	3.0	1193	0.044	20[6]	NA	NA
Approach	245	16	163	424	3.0		0.221			

West: S 170th St (EB)

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	92	5	103	3.0	1180	0.088	100	NA	NA
Approach	5	92	5	103	3.0		0.088			

	Total	%HV	Deg.Satn (v/c)
Intersection	527	3.0	0.221

LANE SUMMARY

Site: 113 [113-Des Moines Memorial Dr @ SR 509 NB Ramps (Site Folder: 2032 PA)]

113-Des Moines Memorial Dr @ SR 509 NB Ramps, 2032 Proposed Action
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 509 NB Off Ramp													
Lane 1[d]	256	4.0	636	0.402	100	13.5	LOS B	1.9	48.2	Full	1600	0.0	0.0
Approach	256	4.0		0.402		13.5	LOS B	1.9	48.2				
East: Des Moines Memorial Dr (WB)													
Lane 1[d]	505	5.0	1137	0.444	100	7.2	LOS A	3.1	80.0	Full	1600	0.0	0.0
Lane 2	635	5.0	1595	0.398	100	4.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	1140	5.0		0.444		5.4	LOS A	3.1	80.0				
West: Des Moines Memorial Dr (EB)													
Lane 1	851	6.0	1415	0.602	100	7.0	LOS A	0.0	0.0	Full	1000	0.0	0.0
Lane 2[d]	949	6.0	1577	0.602	100	4.5	LOS A	0.0	0.0	Full	1000	0.0	0.0
Approach	1800	6.0		0.602		5.7	LOS A	0.0	0.0				
Intersection	3196	5.5		0.602		6.2	LOS A	3.1	80.0				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 509 NB Off Ramp

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	90	1	165	256	4.0	636	0.402	100	NA	NA
Approach	90	1	165	256	4.0		0.402			

East: Des Moines Memorial Dr (WB)

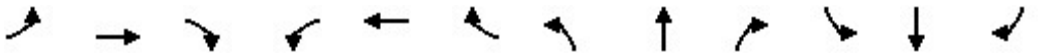
Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	505	-	505	5.0	1137	0.444	100	NA	NA
Lane 2	-	635	635	5.0	1595	0.398	100	NA	NA
Approach	505	635	1140	5.0		0.444			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	200	10	215	595
Future Volume (vph)	0	0	200	10	215	595
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)			5.0		5.0	5.0
Lane Util. Factor			0.95		1.00	0.95
Frt			0.99		1.00	1.00
Flt Protected			1.00		0.95	1.00
Satd. Flow (prot)			3237		1630	3260
Flt Permitted			1.00		0.62	1.00
Satd. Flow (perm)			3237		1064	3260
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	200	10	215	595
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	210	0	215	595
Turn Type			NA		Perm	NA
Protected Phases			2			6
Permitted Phases					6	
Actuated Green, G (s)			21.0		21.0	21.0
Effective Green, g (s)			21.0		21.0	21.0
Actuated g/C Ratio			1.00		1.00	1.00
Clearance Time (s)			5.0		5.0	5.0
Lane Grp Cap (vph)			3237		1064	3260
v/s Ratio Prot			0.06			0.18
v/s Ratio Perm					c0.20	
v/c Ratio			0.06		0.20	0.18
Uniform Delay, d1			0.0		0.0	0.0
Progression Factor			1.00		1.00	1.00
Incremental Delay, d2			0.0		0.3	0.1
Delay (s)			0.0		0.3	0.1
Level of Service			A		A	A
Approach Delay (s)	0.0		0.0			0.2
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	0.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	21.0	Sum of lost time (s)	5.0
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	140	200	0	0	800
Future Volume (vph)	10	140	200	0	0	800
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0			5.0
Lane Util. Factor	1.00	1.00	0.95			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1630	1458	3260			3260
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1630	1458	3260			3260
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	140	200	0	0	800
RTOR Reduction (vph)	0	87	0	0	0	0
Lane Group Flow (vph)	10	53	200	0	0	800
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	16.0	16.0	16.0			16.0
Effective Green, g (s)	16.0	16.0	16.0			16.0
Actuated g/C Ratio	0.38	0.38	0.38			0.38
Clearance Time (s)	5.0	5.0	5.0			5.0
Lane Grp Cap (vph)	620	555	1241			1241
v/s Ratio Prot	0.01		0.06			c0.25
v/s Ratio Perm		c0.04				
v/c Ratio	0.02	0.10	0.16			0.64
Uniform Delay, d1	8.1	8.4	8.6			10.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.0	0.3	0.3			2.6
Delay (s)	8.1	8.7	8.9			13.3
Level of Service	A	A	A			B
Approach Delay (s)	8.7		8.9			13.3
Approach LOS	A		A			B

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
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)	0	690	0	0	490	495	0	560	330	0	0	0
Future Volume (vph)	0	690	0	0	490	495	0	560	330	0	0	0
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		5.0				
Lane Util. Factor		0.95			0.95	1.00		0.95				
Frt		1.00			1.00	0.85		0.94				
Flt Protected		1.00			1.00	1.00		1.00				
Satd. Flow (prot)		3260			3260	1458		3079				
Flt Permitted		1.00			1.00	1.00		1.00				
Satd. Flow (perm)		3260			3260	1458		3079				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	690	0	0	490	495	0	560	330	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	92	0	57	0	0	0	0
Lane Group Flow (vph)	0	690	0	0	490	403	0	833	0	0	0	0
Turn Type		NA			NA	Perm		NA				
Protected Phases		4			8			2				
Permitted Phases						8						
Actuated Green, G (s)		77.0			77.0	77.0		63.0				
Effective Green, g (s)		77.0			77.0	77.0		63.0				
Actuated g/C Ratio		0.51			0.51	0.51		0.42				
Clearance Time (s)		5.0			5.0	5.0		5.0				
Lane Grp Cap (vph)		1673			1673	748		1293				
v/s Ratio Prot		0.21			0.15			c0.27				
v/s Ratio Perm						c0.28						
v/c Ratio		0.41			0.29	0.54		0.64				
Uniform Delay, d1		22.5			20.9	24.5		34.6				
Progression Factor		1.04			1.00	1.00		0.51				
Incremental Delay, d2		0.6			0.4	2.8		1.8				
Delay (s)		24.0			21.4	27.3		19.3				
Level of Service		C			C	C		B				
Approach Delay (s)		24.0			24.3			19.3			0.0	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	490	0	0	0	690	1460
Future Volume (vph)	490	0	0	0	690	1460
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0				5.0	5.0
Lane Util. Factor	0.97				1.00	0.91
Frt	1.00				1.00	1.00
Flt Protected	0.95				0.95	1.00
Satd. Flow (prot)	3162				1630	4684
Flt Permitted	0.95				0.95	1.00
Satd. Flow (perm)	3162				1630	4684
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	490	0	0	0	690	1460
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	490	0	0	0	690	1460
Turn Type	Prot				Prot	NA
Protected Phases	3				1	6
Permitted Phases						
Actuated Green, G (s)	38.0				102.0	102.0
Effective Green, g (s)	38.0				102.0	102.0
Actuated g/C Ratio	0.25				0.68	0.68
Clearance Time (s)	5.0				5.0	5.0
Lane Grp Cap (vph)	801				1108	3185
v/s Ratio Prot	c0.15				c0.42	0.31
v/s Ratio Perm						
v/c Ratio	0.61				0.62	0.46
Uniform Delay, d1	49.5				13.3	11.2
Progression Factor	0.69				1.00	1.00
Incremental Delay, d2	3.4				2.6	0.5
Delay (s)	37.5				16.0	11.6
Level of Service	D				B	B
Approach Delay (s)	37.5		0.0			13.0
Approach LOS	D		A			B

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	115.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			