Attachment 2.L

2022 Future Condition Intersection Capacity Analyses with Improvements

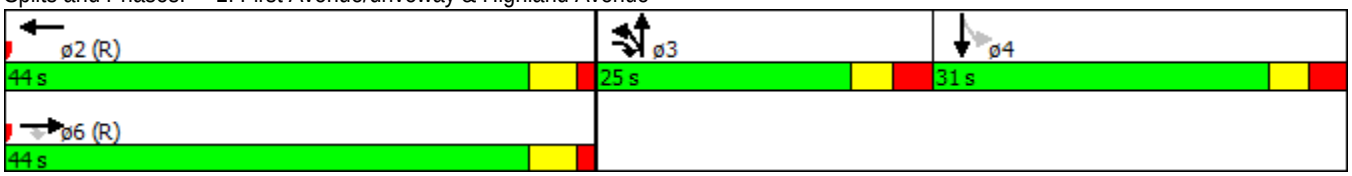
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1323	900	0	907	0	365	0	53	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	16	16	16
Storage Length (ft)	0		85	0		0	0		200	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98					1.00				
Frt			0.850					0.961				
Flt Protected							0.950	0.964				
Satd. Flow (prot)	0	3421	1516	0	3388	0	1658	1598	0	0	2153	0
Flt Permitted							0.950	0.964				
Satd. Flow (perm)	0	3421	1484	0	3388	0	1658	1598	0	0	2153	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			476					87				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		459			760			528			157	
Travel Time (s)		10.4			17.3			12.0			3.6	
Lane Group Flow (vph)	0	1438	978	0	986	0	230	225	0	0	0	0
Turn Type		NA	pm+ov		NA		Split	NA				
Protected Phases		6	3		2		3	3			4	
Permitted Phases			6							4		
Total Split (s)		44.0	25.0		44.0		25.0	25.0		31.0	31.0	
Total Lost Time (s)		5.0	6.0		5.0		6.0	6.0			6.0	
Act Effct Green (s)		64.5	81.8		64.5		18.3	18.3				
Actuated g/C Ratio		0.64	0.82		0.64		0.18	0.18				
v/c Ratio		0.65	0.75		0.45		0.76	0.62				
Control Delay		16.0	8.3		11.4		55.9	30.7				
Queue Delay		0.0	0.0		0.0		0.0	0.0				
Total Delay		16.0	8.3		11.4		55.9	30.7				
LOS		B	A		B		E	C				
Approach Delay		12.9			11.4			43.4				
Approach LOS		B			B			D				
Queue Length 50th (ft)		217	0		78		146	83				
Queue Length 95th (ft)		#676	#501		314		#258	168				
Internal Link Dist (ft)		379			680			448			77	
Turn Bay Length (ft)			85									
Base Capacity (vph)		2207	1314		2186		315	374				
Starvation Cap Reductn		0	0		0		0	0				
Spillback Cap Reductn		0	0		0		0	0				
Storage Cap Reductn		0	0		0		0	0				
Reduced v/c Ratio		0.65	0.74		0.45		0.73	0.60				

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 77 (77%), Referenced to phase 2:WBT and 6:EBT, Start of Green	

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 60.8%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: First Avenue/driveway & Highland Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1323	900	0	907	0	365	0	53	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	16	16	16
Total Lost time (s)		5.0	6.0		5.0		6.0	6.0				
Lane Util. Factor		0.95	1.00		0.95		0.95	0.95				
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00				
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00				
Frt		1.00	0.85		1.00		1.00	0.96				
Flt Protected		1.00	1.00		1.00		0.95	0.96				
Satd. Flow (prot)		3421	1492		3388		1658	1599				
Flt Permitted		1.00	1.00		1.00		0.95	0.96				
Satd. Flow (perm)		3421	1492		3388		1658	1599				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	1438	978	0	986	0	397	0	58	0	0	0
RTOR Reduction (vph)	0	0	105	0	0	0	0	71	0	0	0	0
Lane Group Flow (vph)	0	1438	873	0	986	0	230	154	0	0	0	0
Confl. Peds. (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	3%	0%	3%	0%	0%	0%	3%	0%	0%	0%
Turn Type		NA	pm+ov		NA		Split	NA				
Protected Phases		6	3		2		3	3			4	
Permitted Phases			6							4		
Actuated Green, G (s)		59.7	78.0		59.7		18.3	18.3				
Effective Green, g (s)		59.7	78.0		59.7		18.3	18.3				
Actuated g/C Ratio		0.60	0.78		0.60		0.18	0.18				
Clearance Time (s)		5.0	6.0		5.0		6.0	6.0				
Vehicle Extension (s)		2.0	2.0		2.0		2.0	2.0				
Lane Grp Cap (vph)		2042	1163		2022		303	292				
v/s Ratio Prot		0.42	c0.14		0.29		c0.14	0.10				
v/s Ratio Perm			0.45									
v/c Ratio		0.70	0.75		0.49		0.76	0.53				
Uniform Delay, d1		14.0	5.8		11.5		38.8	36.9				
Progression Factor		1.00	1.00		0.92		1.00	1.00				
Incremental Delay, d2		2.1	2.5		0.7		9.3	0.8				
Delay (s)		16.1	8.3		11.3		48.1	37.7				
Level of Service		B	A		B		D	D				
Approach Delay (s)		12.9			11.3			43.0			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	952	145	337	621	4	259	1	146	31	14	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	12	12	14
Storage Length (ft)	50		0	0		0	200		125	0		0
Storage Lanes	1		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00				0.98		1.00	
Frt		0.980			0.999				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.953			0.966	
Satd. Flow (prot)	1745	3376	0	1787	1861	0	1564	1568	1531	0	1774	1378
Flt Permitted	0.407			0.114			0.950	0.953			0.966	
Satd. Flow (perm)	745	3376	0	214	1861	0	1564	1568	1502	0	1767	1378
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18							109			153
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		760			228			667			232	
Travel Time (s)		17.3			5.2			15.2			5.3	
Lane Group Flow (vph)	11	1193	0	366	679	0	141	142	159	0	49	1
Turn Type	Perm	NA		pm+pt	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases		6		5	2 5		8	8	5	4	4	
Permitted Phases	6			2 5					8			4
Total Split (s)	39.0	39.0		19.0			29.5	29.5	19.0	12.5	12.5	12.5
Total Lost Time (s)	6.5	6.5		4.0			6.5	6.5	4.0		6.5	6.5
Act Effct Green (s)	36.3	36.3		60.9	62.4		14.6	14.6	39.2		5.7	5.7
Actuated g/C Ratio	0.36	0.36		0.61	0.62		0.15	0.15	0.39		0.06	0.06
v/c Ratio	0.04	0.96		0.77	0.59		0.62	0.62	0.24		0.49	0.00
Control Delay	10.1	38.8		35.8	15.8		50.9	51.0	7.2		62.2	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0
Total Delay	10.1	38.8		35.8	15.8		50.9	51.0	7.2		62.2	0.0
LOS	B	D		D	B		D	D	A		E	A
Approach Delay		38.5			22.8			35.2			61.0	
Approach LOS		D			C			D			E	
Queue Length 50th (ft)	5	~445		157	245		91	91	18		31	0
Queue Length 95th (ft)	m1	#550		#391	454		141	143	56		69	0
Internal Link Dist (ft)		680			148			587			152	
Turn Bay Length (ft)	50						200		125			
Base Capacity (vph)	271	1238		476	1160		359	360	661		106	226
Starvation Cap Reductn	0	0		0	0		0	0	0		0	0
Spillback Cap Reductn	0	0		0	0		0	0	0		0	0
Storage Cap Reductn	0	0		0	0		0	0	0		0	0
Reduced v/c Ratio	0.04	0.96		0.77	0.59		0.39	0.39	0.24		0.46	0.00

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green, Master Intersection	

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Total Split (s)	39.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

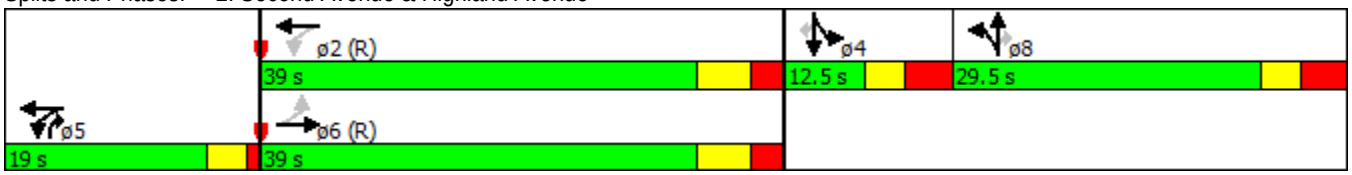
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 32.4	Intersection LOS: C
Intersection Capacity Utilization 78.5%	ICU Level of Service D
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 2: Second Avenue & Highland Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	952	145	337	621	4	259	1	146	31	14	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	12	12	14
Total Lost time (s)	6.5	6.5		4.0	6.5		6.5	6.5	4.0		6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	1.00		0.95	0.95	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
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.95	1.00		0.97	1.00
Satd. Flow (prot)	1738	3377		1787	1861		1564	1567	1519		1775	1378
Flt Permitted	0.41	1.00		0.11	1.00		0.95	0.95	1.00		0.97	1.00
Satd. Flow (perm)	744	3377		214	1861		1564	1567	1519		1775	1378
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1035	158	366	675	4	282	1	159	34	15	1
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	69	0	0	1
Lane Group Flow (vph)	11	1181	0	366	679	0	141	142	90	0	49	0
Confl. Peds. (#/hr)	5		1	1		5			5	5		
Heavy Vehicles (%)	0%	1%	1%	1%	2%	0%	6%	13%	2%	5%	0%	25%
Turn Type	Perm	NA		pm+pt	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases		6		5	2 5		8	8	5	4	4	
Permitted Phases	6			2 5					8			4
Actuated Green, G (s)	35.1	35.1		57.1	61.1		14.6	14.6	36.6		4.8	4.8
Effective Green, g (s)	35.1	35.1		57.1	57.1		14.6	14.6	36.6		4.8	4.8
Actuated g/C Ratio	0.35	0.35		0.57	0.57		0.15	0.15	0.37		0.05	0.05
Clearance Time (s)	6.5	6.5		4.0			6.5	6.5	4.0		6.5	6.5
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	261	1185		468	1062		228	228	555		85	66
v/s Ratio Prot		c0.35		c0.17	0.36		0.09	c0.09	0.04		c0.03	
v/s Ratio Perm	0.01			0.27					0.02			0.00
v/c Ratio	0.04	1.00		0.78	0.64		0.62	0.62	0.16		0.58	0.00
Uniform Delay, d1	21.4	32.4		25.1	14.5		40.1	40.1	21.4		46.6	45.3
Progression Factor	0.42	0.65		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.2	22.0		7.7	0.9		3.5	3.8	0.1		5.8	0.0
Delay (s)	9.2	43.0		32.8	15.4		43.6	43.9	21.4		52.4	45.3
Level of Service	A	D		C	B		D	D	C		D	D
Approach Delay (s)		42.7			21.5			35.7			52.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	795	1830	348	125	574	74	20	2	14	112	19	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	11	10	13	15	15	14	14	14
Storage Length (ft)	315		180	150		0	100		0	0		150
Storage Lanes	1		1	1		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt			0.850		0.983			0.882				0.850
Flt Protected	0.950			0.950			0.950	0.995			0.959	
Satd. Flow (prot)	3268	3455	1561	1668	3387	0	1626	1513	0	0	1710	1485
Flt Permitted	0.950			0.950			0.950	0.995			0.959	
Satd. Flow (perm)	3268	3455	1561	1668	3387	0	1626	1513	0	0	1710	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			167		11			15				235
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		682			1017			566			576	
Travel Time (s)		15.5			23.1			12.9			13.1	
Lane Group Flow (vph)	864	1989	378	136	704	0	20	19	0	0	143	98
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	Free
Protected Phases	1	6	6 8	5	2		8	8		4	4	
Permitted Phases												Free
Total Split (s)	26.0	59.0		13.0	46.0		12.0	12.0		13.0	13.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Act Effct Green (s)	44.9	69.8	81.8	18.6	43.5		7.0	7.0			8.0	130.0
Actuated g/C Ratio	0.35	0.54	0.63	0.14	0.33		0.05	0.05			0.06	1.00
v/c Ratio	0.77	1.07	0.36	0.57	0.62		0.23	0.20			1.36	0.07
Control Delay	48.2	68.6	7.0	52.0	38.2		65.6	34.5			256.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	48.2	68.6	7.0	52.0	38.2		65.6	34.5			256.8	0.1
LOS	D	E	A	D	D		E	C			F	A
Approach Delay		55.9			40.4			50.4			152.4	
Approach LOS		E			D			D			F	
Queue Length 50th (ft)	323	562	37	120	174		16	3			~158	0
Queue Length 95th (ft)	#678	#1297	159	m#194	m245		47	31			#297	0
Internal Link Dist (ft)		602			937			486			496	
Turn Bay Length (ft)	315		180	150			100					150
Base Capacity (vph)	1129	1854	1043	238	1139		87	95			105	1485
Starvation Cap Reductn	0	0	0	0	0		0	0			0	0
Spillback Cap Reductn	0	0	0	0	0		0	0			0	0
Storage Cap Reductn	0	0	0	0	0		0	0			0	0
Reduced v/c Ratio	0.77	1.07	0.36	0.57	0.62		0.23	0.20			1.36	0.07

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Total Split (s)	33.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

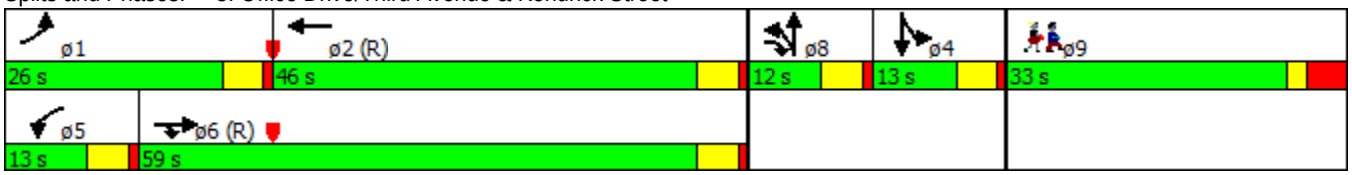
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.36	
Intersection Signal Delay: 58.2	Intersection LOS: E
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 3: Office Drive/Third Avenue & Kendrick Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	795	1830	348	125	574	74	20	2	14	112	19	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	10	13	15	15	14	14	14
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.95	0.95			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
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	0.98		1.00	0.88			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99			0.96	1.00
Satd. Flow (prot)	3268	3455	1561	1668	3387		1626	1512			1710	1485
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.99			0.96	1.00
Satd. Flow (perm)	3268	3455	1561	1668	3387		1626	1512			1710	1485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	864	1989	378	136	624	80	22	2	15	122	21	98
RTOR Reduction (vph)	0	0	68	0	8	0	0	14	0	0	0	0
Lane Group Flow (vph)	864	1989	310	136	696	0	20	5	0	0	143	98
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	1%	0%	1%	1%	2%	9%	0%	18%	15%	6%	16%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	Free
Protected Phases	1	6	6 8	5	2		8	8		4	4	
Permitted Phases												Free
Actuated Green, G (s)	44.9	65.0	77.0	18.6	38.7		7.0	7.0			8.0	130.0
Effective Green, g (s)	44.9	65.0	77.0	18.6	38.7		7.0	7.0			8.0	130.0
Actuated g/C Ratio	0.35	0.50	0.59	0.14	0.30		0.05	0.05			0.06	1.00
Clearance Time (s)	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	
Lane Grp Cap (vph)	1128	1727	924	238	1008		87	81			105	1485
v/s Ratio Prot	c0.26	c0.58	c0.20	0.08	0.21		0.01	0.00			c0.08	
v/s Ratio Perm												c0.07
v/c Ratio	0.77	1.15	0.34	0.57	0.69		0.23	0.06			1.36	0.07
Uniform Delay, d1	37.9	32.5	13.5	52.0	40.4		58.9	58.4			61.0	0.0
Progression Factor	1.16	0.85	0.88	0.83	1.02		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.6	74.8	0.1	1.2	2.3		0.5	0.1			212.3	0.1
Delay (s)	46.4	102.5	11.9	44.6	43.6		59.4	58.5			273.3	0.1
Level of Service	D	F	B	D	D		E	E			F	A
Approach Delay (s)		76.9			43.8			59.0			162.2	
Approach LOS		E			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	75.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	461	1610	2	0	718	300	0	2	2	175	0	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	14	14	14	13	13	16
Storage Length (ft)	200		0	0		100	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00				0.98						
Frt						0.850		0.932				0.850
Flt Protected	0.950										0.950	
Satd. Flow (prot)	1711	3388	0	0	1818	1531	0	1889	0	0	1811	1794
Flt Permitted	0.950										0.950	
Satd. Flow (perm)	1711	3388	0	0	1818	1499	0	1889	0	0	1811	1794
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						121		2				197
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1017			576			212			157	
Travel Time (s)		23.1			13.1			4.8			3.6	
Lane Group Flow (vph)	501	1752	0	0	780	326	0	4	0	0	190	197
Turn Type	Prot	NA			NA	pm+ov		NA		Split	NA	pt+ov
Protected Phases	5	2			6	4		8		4	4	4 5
Permitted Phases				6		6	8					
Total Split (s)	43.0	96.0		53.0	53.0	23.0	11.0	11.0		23.0	23.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Act Effct Green (s)	39.0	102.6			59.6	76.8		7.0			17.2	60.2
Actuated g/C Ratio	0.30	0.79			0.46	0.59		0.05			0.13	0.46
v/c Ratio	0.98	0.66			0.94	0.35		0.04			0.79	0.21
Control Delay	48.8	2.2			53.6	7.7		47.8			77.8	3.1
Queue Delay	0.0	0.5			0.0	0.0		0.0			0.0	0.0
Total Delay	48.8	2.7			53.6	7.7		47.8			77.8	3.1
LOS	D	A			D	A		D			E	A
Approach Delay		12.9			40.1			47.8			39.7	
Approach LOS		B			D			D			D	
Queue Length 50th (ft)	434	8			607	68		2			155	0
Queue Length 95th (ft)	m402	m34			#1011	117		14			#255	41
Internal Link Dist (ft)		937			496			132			77	
Turn Bay Length (ft)	200					100						
Base Capacity (vph)	513	2673			833	953		103			264	958
Starvation Cap Reductn	0	458			0	0		0			0	0
Spillback Cap Reductn	0	0			0	0		0			0	0
Storage Cap Reductn	0	0			0	0		0			0	0
Reduced v/c Ratio	0.98	0.79			0.94	0.34		0.04			0.72	0.21

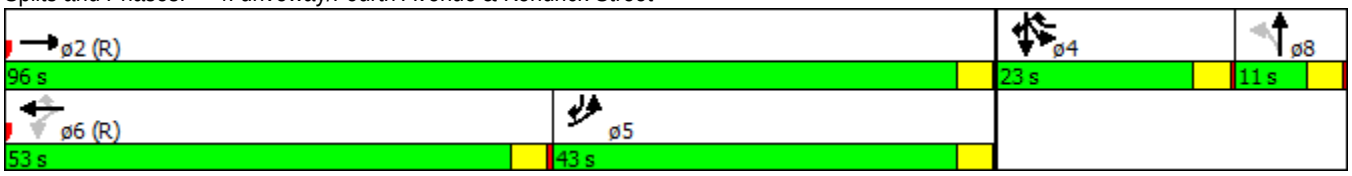
Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 108.7%	ICU Level of Service G
Analysis Period (min) 15	

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

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

Splits and Phases: 4: driveway/Fourth Avenue & Kendrick Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	461	1610	2	0	718	300	0	2	2	175	0	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	14	14	14	13	13	16
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.98		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	1.00			1.00	0.85		0.93			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		1.00			0.95	1.00
Satd. Flow (prot)	1711	3387			1818	1506		1890			1811	1794
Flt Permitted	0.95	1.00			1.00	1.00		1.00			0.95	1.00
Satd. Flow (perm)	1711	3387			1818	1506		1890			1811	1794
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	501	1750	2	0	780	326	0	2	2	190	0	197
RTOR Reduction (vph)	0	0	0	0	0	52	0	2	0	0	0	106
Lane Group Flow (vph)	501	1752	0	0	780	274	0	2	0	0	190	91
Confl. Peds. (#/hr)			2	2								
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	0%	0%	3%	0%	2%
Turn Type	Prot	NA			NA	pm+ov		NA		Split	NA	pt+ov
Protected Phases	5	2			6	4		8		4	4	4 5
Permitted Phases				6		6	8					
Actuated Green, G (s)	39.0	99.4			56.4	73.6		1.4			17.2	60.2
Effective Green, g (s)	39.0	99.4			56.4	73.6		1.4			17.2	60.2
Actuated g/C Ratio	0.30	0.76			0.43	0.57		0.01			0.13	0.46
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	513	2589			788	852		20			239	830
v/s Ratio Prot	c0.29	0.52			c0.43	0.04		c0.00			c0.10	0.05
v/s Ratio Perm						0.14						
v/c Ratio	0.98	0.68			0.99	0.32		0.10			0.79	0.11
Uniform Delay, d1	45.0	7.5			36.5	15.0		63.7			54.7	19.7
Progression Factor	0.90	0.29			1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	7.4	0.1			29.7	0.2		2.2			16.5	0.1
Delay (s)	47.9	2.3			66.2	15.2		65.9			71.2	19.8
Level of Service	D	A			E	B		E			E	B
Approach Delay (s)		12.4			51.2			65.9			45.0	
Approach LOS		B			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1092	189	0	1747	0	685	0	198	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	16	16	16
Storage Length (ft)	0		85	0		0	0		200	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98					0.99				
Frt			0.850					0.931				
Flt Protected							0.950	0.974				
Satd. Flow (prot)	0	3455	1487	0	3455	0	1658	1563	0	0	2153	0
Flt Permitted							0.950	0.974				
Satd. Flow (perm)	0	3455	1456	0	3455	0	1658	1563	0	0	2153	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121					67				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		459			760			528			157	
Travel Time (s)		10.4			17.3			12.0			3.6	
Lane Group Flow (vph)	0	1187	205	0	1899	0	492	468	0	0	0	0
Turn Type		NA	pm+ov		NA		Split	NA				
Protected Phases		6	3		2		3	3			4	
Permitted Phases			6							4		
Total Split (s)		53.0	46.0		53.0		46.0	46.0		31.0	31.0	
Total Lost Time (s)		5.0	6.0		5.0		6.0	6.0			6.0	
Act Effct Green (s)		73.4	111.8		73.4		39.4	39.4				
Actuated g/C Ratio		0.56	0.86		0.56		0.30	0.30				
v/c Ratio		0.61	0.16		0.97		0.98	0.90				
Control Delay		22.8	1.4		32.6		80.1	58.5				
Queue Delay		0.0	0.0		0.0		0.0	0.0				
Total Delay		22.8	1.4		32.6		80.1	58.5				
LOS		C	A		C		F	E				
Approach Delay		19.7			32.6			69.6				
Approach LOS		B			C			E				
Queue Length 50th (ft)		297	0		579		429	347				
Queue Length 95th (ft)		#644	43		m#1058		#665	#558				
Internal Link Dist (ft)		379			680			448			77	
Turn Bay Length (ft)			85									
Base Capacity (vph)		1949	1284		1949		510	527				
Starvation Cap Reductn		0	0		0		0	0				
Spillback Cap Reductn		0	0		0		0	0				
Storage Cap Reductn		0	0		0		0	0				
Reduced v/c Ratio		0.61	0.16		0.97		0.96	0.89				

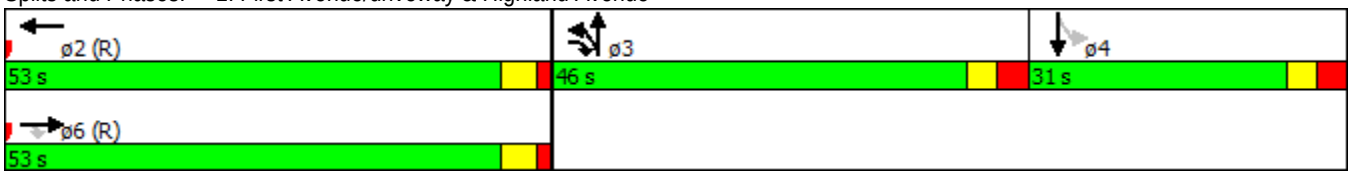
Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 6 (5%), Referenced to phase 2:WBT and 6:EBT, Start of Green	

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 36.7	Intersection LOS: D
Intersection Capacity Utilization 82.6%	ICU Level of Service E
Analysis Period (min) 15	

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

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

Splits and Phases: 1: First Avenue/driveway & Highland Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1092	189	0	1747	0	685	0	198	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	16	16	16
Total Lost time (s)		5.0	6.0		5.0		6.0	6.0				
Lane Util. Factor		0.95	1.00		0.95		0.95	0.95				
Frpb, ped/bikes		1.00	0.99		1.00		1.00	0.99				
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00				
Frt		1.00	0.85		1.00		1.00	0.93				
Flt Protected		1.00	1.00		1.00		0.95	0.97				
Satd. Flow (prot)		3455	1467		3455		1658	1562				
Flt Permitted		1.00	1.00		1.00		0.95	0.97				
Satd. Flow (perm)		3455	1467		3455		1658	1562				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1187	205	0	1899	0	745	0	215	0	0	0
RTOR Reduction (vph)	0	0	20	0	0	0	0	47	0	0	0	0
Lane Group Flow (vph)	0	1187	185	0	1899	0	492	421	0	0	0	0
Confl. Peds. (#/hr)			1						5			
Heavy Vehicles (%)	0%	1%	5%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA	pm+ov		NA		Split	NA				
Protected Phases		6	3		2		3	3			4	
Permitted Phases			6							4		
Actuated Green, G (s)		68.6	108.0		68.6		39.4	39.4				
Effective Green, g (s)		68.6	108.0		68.6		39.4	39.4				
Actuated g/C Ratio		0.53	0.83		0.53		0.30	0.30				
Clearance Time (s)		5.0	6.0		5.0		6.0	6.0				
Vehicle Extension (s)		2.0	2.0		2.0		2.0	2.0				
Lane Grp Cap (vph)		1823	1218		1823		502	473				
v/s Ratio Prot		0.34	0.05		c0.55		c0.30	0.27				
v/s Ratio Perm			0.08									
v/c Ratio		0.65	0.15		1.04		0.98	0.89				
Uniform Delay, d1		22.1	2.1		30.7		44.9	43.2				
Progression Factor		1.00	1.00		0.89		1.00	1.00				
Incremental Delay, d2		1.8	0.0		25.1		34.8	18.2				
Delay (s)		23.9	2.2		52.5		79.7	61.4				
Level of Service		C	A		D		E	E				
Approach Delay (s)		20.7			52.5			70.8			0.0	
Approach LOS		C			D			E			A	

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	959	172	136	1180	69	376	24	287	100	13	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	12	12	14
Storage Length (ft)	50		0	0		0	200		125	0		0
Storage Lanes	1		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00				0.98		0.99	
Frt		0.977			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.958			0.958	
Satd. Flow (prot)	1745	3367	0	1805	1862	0	1625	1643	1531	0	1800	1723
Flt Permitted	0.056			0.143			0.950	0.958			0.958	
Satd. Flow (perm)	103	3367	0	272	1862	0	1625	1643	1497	0	1788	1723
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			4				85			117
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		760			228			667			232	
Travel Time (s)		17.3			5.2			15.2			5.3	
Lane Group Flow (vph)	5	1229	0	148	1358	0	217	218	312	0	123	30
Turn Type	Perm	NA		pm+pt	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases		6		5	2 5		8	8	5	4	4	
Permitted Phases	6			2 5					8			4
Total Split (s)	77.5	77.5		9.0			29.5	29.5	9.0	14.0	14.0	14.0
Total Lost Time (s)	6.5	6.5		4.0			6.5	6.5	4.0		6.5	6.5
Act Effct Green (s)	71.0	71.0		81.2	82.7		20.3	20.3	30.5		7.5	7.5
Actuated g/C Ratio	0.55	0.55		0.62	0.64		0.16	0.16	0.23		0.06	0.06
v/c Ratio	0.09	0.66		0.57	1.15		0.86	0.85	0.75		1.19	0.14
Control Delay	8.6	12.4		19.8	100.5		82.3	81.5	43.0		200.8	1.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0
Total Delay	8.6	12.5		19.8	100.5		82.3	81.5	43.0		200.8	1.4
LOS	A	B		B	F		F	F	D		F	A
Approach Delay		12.4			92.6			65.7			161.7	
Approach LOS		B			F			E			F	
Queue Length 50th (ft)	1	407		46	~1366		186	187	173		~124	0
Queue Length 95th (ft)	m1	92		#80	#1646		#308	#305	#283		#254	0
Internal Link Dist (ft)		680			148			587			152	
Turn Bay Length (ft)	50						200		125			
Base Capacity (vph)	56	1850		260	1186		287	290	418		103	209
Starvation Cap Reductn	0	32		0	0		0	0	0		0	0
Spillback Cap Reductn	0	0		0	0		0	0	0		0	0
Storage Cap Reductn	0	0		0	0		0	0	0		0	0
Reduced v/c Ratio	0.09	0.68		0.57	1.15		0.76	0.75	0.75		1.19	0.14

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green, Master Intersection

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Total Split (s)	77.5
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 62.8	Intersection LOS: E
Intersection Capacity Utilization 113.1%	ICU Level of Service H
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 2: Second Avenue & Highland Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	959	172	136	1180	69	376	24	287	100	13	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	12	12	14
Total Lost time (s)	6.5	6.5		4.0	6.5		6.5	6.5	4.0		6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	1.00		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		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	0.98		1.00	0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1745	3368		1805	1862		1625	1642	1506		1799	1723
Flt Permitted	0.06	1.00		0.14	1.00		0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	103	3368		271	1862		1625	1642	1506		1799	1723
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1042	187	148	1283	75	409	26	312	109	14	30
RTOR Reduction (vph)	0	11	0	0	2	0	0	0	67	0	0	28
Lane Group Flow (vph)	5	1218	0	148	1356	0	217	218	245	0	123	2
Confl. Peds. (#/hr)	10		3	3		10			6	6		
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	2%	0%	2%	0%	10%	0%
Turn Type	Perm	NA		pm+pt	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases		6		5	2 5		8	8	5	4	4	
Permitted Phases	6			2 5					8			4
Actuated Green, G (s)	71.0	71.0		78.7	82.7		20.3	20.3	28.0		7.5	7.5
Effective Green, g (s)	71.0	71.0		78.7	78.7		20.3	20.3	28.0		7.5	7.5
Actuated g/C Ratio	0.55	0.55		0.61	0.61		0.16	0.16	0.22		0.06	0.06
Clearance Time (s)	6.5	6.5		4.0			6.5	6.5	4.0		6.5	6.5
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	56	1839		254	1127		253	256	324		103	99
v/s Ratio Prot		0.36		0.03	c0.73		c0.13	0.13	0.04		c0.07	
v/s Ratio Perm	0.05			0.32					0.12			0.00
v/c Ratio	0.09	0.66		0.58	1.20		0.86	0.85	0.76		1.19	0.02
Uniform Delay, d1	14.1	21.0		15.2	25.6		53.4	53.4	47.8		61.2	57.8
Progression Factor	0.39	0.53		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	1.4		2.2	100.2		23.0	22.1	8.7		150.0	0.0
Delay (s)	7.9	12.5		17.3	125.9		76.5	75.5	56.5		211.2	57.8
Level of Service	A	B		B	F		E	E	E		F	E
Approach Delay (s)		12.5			115.2			67.8			181.2	
Approach LOS		B			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	73.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	113.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	315	759	7	33	1464	34	372	7	72	92	2	664
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	11	10	13	15	15	14	14	14
Storage Length (ft)	315		180	150		0	100		0	0		150
Storage Lanes	1		1	1		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt			0.850		0.997			0.951				0.850
Flt Protected	0.950			0.950			0.950	0.969			0.953	
Satd. Flow (prot)	3268	3490	1561	1685	3442	0	1772	1802	0	0	1876	1706
Flt Permitted	0.950			0.950			0.950	0.969			0.953	
Satd. Flow (perm)	3268	3490	1561	1685	3442	0	1772	1802	0	0	1876	1706
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109		2			15				449
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		682			1017			566			576	
Travel Time (s)		15.5			23.1			12.9			13.1	
Lane Group Flow (vph)	342	825	8	36	1628	0	250	240	0	0	102	722
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	Free
Protected Phases	1	6	6 8	5	2		8	8		4	4	
Permitted Phases												Free
Total Split (s)	16.0	53.0		12.0	49.0		20.0	20.0		12.0	12.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Act Effct Green (s)	21.2	78.9	98.9	7.3	60.2		15.0	15.0			7.0	130.0
Actuated g/C Ratio	0.16	0.61	0.76	0.06	0.46		0.12	0.12			0.05	1.00
v/c Ratio	0.64	0.39	0.01	0.38	1.02		1.23	1.09			1.01	0.42
Control Delay	60.5	19.0	0.0	63.8	57.7		184.2	134.9			152.6	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	60.5	19.0	0.0	63.8	57.7		184.2	134.9			152.6	0.8
LOS	E	B	A	E	E		F	F			F	A
Approach Delay		30.9			57.8			160.1			19.6	
Approach LOS		C			E			F			B	
Queue Length 50th (ft)	146	121	0	30	552		~272	~226			~89	0
Queue Length 95th (ft)	#288	387	m0	m42	#1099		#452	#408			#209	0
Internal Link Dist (ft)		602			937			486			496	
Turn Bay Length (ft)	315		180	150			100					150
Base Capacity (vph)	532	2117	1213	95	1595		204	221			101	1706
Starvation Cap Reductn	0	0	0	0	0		0	0			0	0
Spillback Cap Reductn	0	0	0	0	0		0	0			0	0
Storage Cap Reductn	0	0	0	0	0		0	0			0	0
Reduced v/c Ratio	0.64	0.39	0.01	0.38	1.02		1.23	1.09			1.01	0.42

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Total Split (s)	33.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

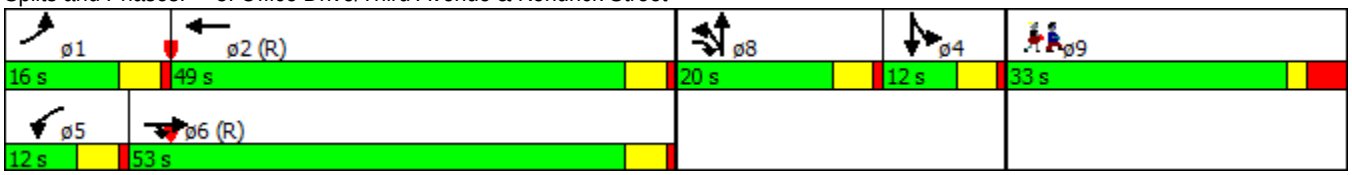
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 54.7	Intersection LOS: D
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 3: Office Drive/Third Avenue & Kendrick Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	315	759	7	33	1464	34	372	7	72	92	2	664
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	10	13	15	15	14	14	14
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.95	0.95			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
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		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97			0.95	1.00
Satd. Flow (prot)	3268	3490	1561	1685	3441		1772	1802			1877	1706
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.97			0.95	1.00
Satd. Flow (perm)	3268	3490	1561	1685	3441		1772	1802			1877	1706
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	342	825	8	36	1591	37	404	8	78	100	2	722
RTOR Reduction (vph)	0	0	2	0	1	0	0	13	0	0	0	0
Lane Group Flow (vph)	342	825	6	36	1627	0	250	227	0	0	102	722
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	0%	0%	0%	1%	3%	0%	7%	4%	1%	100%	1%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	Free
Protected Phases	1	6	6 8	5	2		8	8		4	4	
Permitted Phases												Free
Actuated Green, G (s)	21.2	72.1	92.1	4.5	55.4		15.0	15.0			7.0	130.0
Effective Green, g (s)	21.2	72.1	92.1	4.5	55.4		15.0	15.0			7.0	130.0
Actuated g/C Ratio	0.16	0.55	0.71	0.03	0.43		0.12	0.12			0.05	1.00
Clearance Time (s)	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	
Lane Grp Cap (vph)	532	1935	1105	58	1466		204	207			101	1706
v/s Ratio Prot	c0.10	0.24	0.00	0.02	c0.47		c0.14	0.13			c0.05	
v/s Ratio Perm												c0.42
v/c Ratio	0.64	0.43	0.01	0.62	1.11		1.23	1.10			1.01	0.42
Uniform Delay, d1	50.9	16.9	5.5	61.9	37.3		57.5	57.5			61.5	0.0
Progression Factor	1.06	1.12	1.00	0.94	0.98		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.0	0.7	0.0	9.8	56.8		137.0	90.3			92.3	0.8
Delay (s)	56.1	19.5	5.5	67.8	93.5		194.5	147.8			153.8	0.8
Level of Service	E	B	A	E	F		F	F			F	A
Approach Delay (s)		30.1			92.9			171.6			19.7	
Approach LOS		C			F			F			B	

Intersection Summary			
HCM 2000 Control Delay	69.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	837	2	3	940	365	1	1	2	153	0	401
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	14	14	14	13	13	16
Storage Length (ft)	200		0	0		200	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00				0.98						
Frt						0.850		0.932				0.850
Flt Protected	0.950							0.988			0.950	
Satd. Flow (prot)	1646	3486	0	0	1819	1546	0	1493	0	0	1847	1812
Flt Permitted	0.950				0.998			0.988			0.950	
Satd. Flow (perm)	1646	3486	0	0	1815	1514	0	1493	0	0	1847	1812
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						306		2				178
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1017			576			212			157	
Travel Time (s)		23.1			13.1			4.8			3.6	
Lane Group Flow (vph)	154	912	0	0	1025	397	0	4	0	0	166	436
Turn Type	Prot	NA		Perm	NA	pm+ov	Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6	4	8	8		4	4	4 5
Permitted Phases				6		6						
Total Split (s)	21.0	88.0		67.0	67.0	30.0	12.0	12.0		30.0	30.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Act Effct Green (s)	16.3	100.8			80.5	99.5		7.0			19.0	39.3
Actuated g/C Ratio	0.13	0.78			0.62	0.77		0.05			0.15	0.30
v/c Ratio	0.75	0.34			0.91	0.32		0.05			0.61	0.65
Control Delay	71.3	3.2			36.6	1.5		48.5			61.2	26.6
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	0.0
Total Delay	71.3	3.2			36.6	1.5		48.5			61.2	26.6
LOS	E	A			D	A		D			E	C
Approach Delay		13.1			26.8			48.5			36.1	
Approach LOS		B			C			D			D	
Queue Length 50th (ft)	131	52			684	13		2			133	189
Queue Length 95th (ft)	m#199	m63			#1270	31		14			197	280
Internal Link Dist (ft)		937			496			132			77	
Turn Bay Length (ft)	200					200						
Base Capacity (vph)	215	2702			1123	1266		93			369	758
Starvation Cap Reductn	0	0			0	0		0			0	0
Spillback Cap Reductn	0	0			0	0		0			0	0
Storage Cap Reductn	0	0			0	0		0			0	0
Reduced v/c Ratio	0.72	0.34			0.91	0.31		0.04			0.45	0.58

Intersection Summary

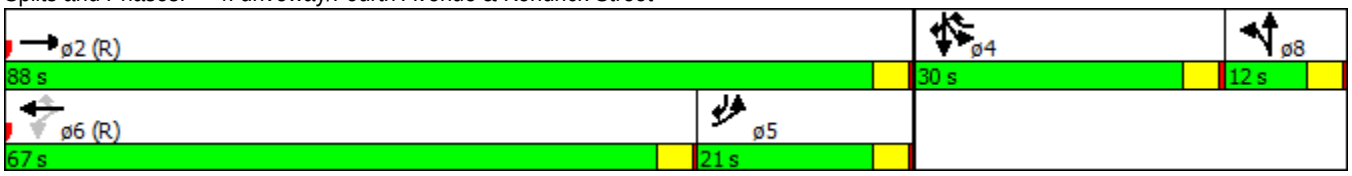
Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 98.0%	ICU Level of Service F
Analysis Period (min) 15	

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

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

Splits and Phases: 4: driveway/Fourth Avenue & Kendrick Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	837	2	3	940	365	1	1	2	153	0	401
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	14	14	14	13	13	16
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.98		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	1.00			1.00	0.85		0.93			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		0.99			0.95	1.00
Satd. Flow (prot)	1646	3485			1818	1520		1493			1847	1812
Flt Permitted	0.95	1.00			1.00	1.00		0.99			0.95	1.00
Satd. Flow (perm)	1646	3485			1815	1520		1493			1847	1812
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	910	2	3	1022	397	1	1	2	166	0	436
RTOR Reduction (vph)	0	0	0	0	0	79	0	2	0	0	0	124
Lane Group Flow (vph)	154	912	0	0	1025	318	0	2	0	0	166	312
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	6%	0%	50%	0%	1%	1%	100%	0%	0%	1%	0%	1%
Turn Type	Prot	NA		Perm	NA	pm+ov	Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6	4	8	8		4	4	4 5
Permitted Phases				6		6						
Actuated Green, G (s)	16.3	97.6			77.3	96.3		1.4			19.0	39.3
Effective Green, g (s)	16.3	97.6			77.3	96.3		1.4			19.0	39.3
Actuated g/C Ratio	0.13	0.75			0.59	0.74		0.01			0.15	0.30
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	206	2616			1079	1125		16			269	547
v/s Ratio Prot	c0.09	0.26				0.04		c0.00			0.09	c0.17
v/s Ratio Perm					c0.56	0.17						
v/c Ratio	0.75	0.35			0.95	0.28		0.13			0.62	0.57
Uniform Delay, d1	54.9	5.5			24.5	5.5		63.7			52.1	38.2
Progression Factor	0.93	0.54			1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	12.4	0.3			17.7	0.1		3.5			4.2	1.4
Delay (s)	63.6	3.3			42.3	5.7		67.2			56.3	39.7
Level of Service	E	A			D	A		E			E	D
Approach Delay (s)		12.0			32.0			67.2			44.2	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1228	209	0	1255	11	234	0	172	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	16	16	16
Storage Length (ft)	0		85	0		0	0		200	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.999			0.868			0.865	
Flt Protected							0.950	0.994				
Satd. Flow (prot)	0	3421	1459	0	3418	0	1658	1492	0	0	1863	0
Flt Permitted							0.950	0.994				
Satd. Flow (perm)	0	3421	1459	0	3418	0	1658	1492	0	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138		1			187			77	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		459			760			528			157	
Travel Time (s)		10.4			17.3			12.0			3.6	
Lane Group Flow (vph)	0	1335	227	0	1376	0	229	212	0	0	3	0
Turn Type		NA	pm+ov		NA		Split	NA			NA	
Protected Phases		6	3		2		3	3			4	
Permitted Phases			6							4		
Total Split (s)		67.0	32.0		67.0		32.0	32.0		31.0	31.0	
Total Lost Time (s)		5.0	6.0		5.0		6.0	6.0			6.0	
Act Effct Green (s)		94.3	126.7		94.3		22.6	22.6			4.5	
Actuated g/C Ratio		0.73	0.97		0.73		0.17	0.17			0.03	
v/c Ratio		0.54	0.16		0.55		0.80	0.51			0.02	
Control Delay		10.6	0.4		6.6		70.6	13.0			0.3	
Queue Delay		0.0	0.0		0.3		0.0	0.0			0.0	
Total Delay		10.6	0.4		6.9		70.6	13.0			0.3	
LOS		B	A		A		E	B			A	
Approach Delay		9.1			6.9			42.9			0.3	
Approach LOS		A			A			D			A	
Queue Length 50th (ft)		217	0		178		197	18			0	
Queue Length 95th (ft)		455	15		m130		271	88			0	
Internal Link Dist (ft)		379			680			448			77	
Turn Bay Length (ft)			85									
Base Capacity (vph)		2482	1410		2480		346	460			420	
Starvation Cap Reductn		0	0		442		0	0			0	
Spillback Cap Reductn		0	0		0		0	0			0	
Storage Cap Reductn		0	0		0		0	0			0	
Reduced v/c Ratio		0.54	0.16		0.68		0.66	0.46			0.01	

Intersection Summary

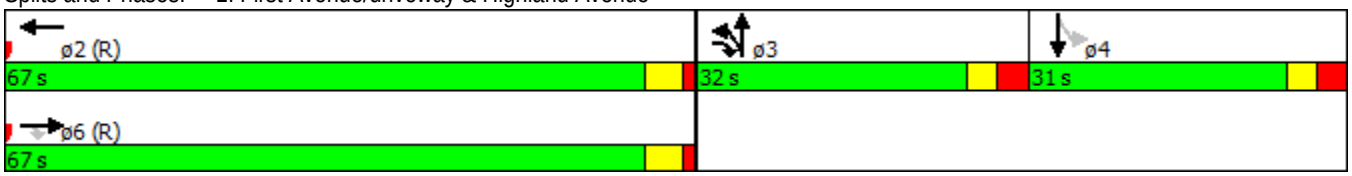
Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 29 (22%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: First Avenue/driveway & Highland Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1228	209	0	1255	11	234	0	172	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	16	16	16
Total Lost time (s)		5.0	6.0		5.0		6.0	6.0			6.0	
Lane Util. Factor		0.95	1.00		0.95		0.95	0.95			1.00	
Frt		1.00	0.85		1.00		1.00	0.87			0.86	
Flt Protected		1.00	1.00		1.00		0.95	0.99			1.00	
Satd. Flow (prot)		3421	1459		3417		1658	1492			1863	
Flt Permitted		1.00	1.00		1.00		0.95	0.99			1.00	
Satd. Flow (perm)		3421	1459		3417		1658	1492			1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1335	227	0	1364	12	254	0	187	0	0	3
RTOR Reduction (vph)	0	0	19	0	0	0	0	154	0	0	3	0
Lane Group Flow (vph)	0	1335	208	0	1376	0	229	58	0	0	0	0
Heavy Vehicles (%)	0%	2%	7%	0%	2%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA	pm+ov		NA		Split	NA			NA	
Protected Phases		6	3		2		3	3			4	
Permitted Phases			6							4		
Actuated Green, G (s)		89.5	112.1		89.5		22.6	22.6			0.9	
Effective Green, g (s)		89.5	112.1		89.5		22.6	22.6			0.9	
Actuated g/C Ratio		0.69	0.86		0.69		0.17	0.17			0.01	
Clearance Time (s)		5.0	6.0		5.0		6.0	6.0			6.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		2355	1258		2352		288	259			12	
v/s Ratio Prot		0.39	0.03		c0.40		c0.14	0.04			c0.00	
v/s Ratio Perm			0.11									
v/c Ratio		0.57	0.17		0.58		0.80	0.22			0.00	
Uniform Delay, d1		10.3	1.4		10.6		51.5	46.1			64.1	
Progression Factor		1.00	1.00		0.64		1.00	1.00			1.00	
Incremental Delay, d2		1.0	0.0		0.3		13.2	0.2			0.0	
Delay (s)		11.3	1.5		7.1		64.6	46.3			64.1	
Level of Service		B	A		A		E	D			E	
Approach Delay (s)		9.9			7.1			55.8			64.1	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1090	170	165	1141	100	137	34	324	88	12	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	12	12	14
Storage Length (ft)	50		0	0		0	200		125	0		0
Storage Lanes	1		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.980			0.988				0.850			0.850
Flt Protected	0.950			0.950			0.950	0.971			0.958	
Satd. Flow (prot)	1745	3386	0	1805	1857	0	1641	1684	1531	0	1789	1641
Flt Permitted	0.058			0.101			0.950	0.971			0.958	
Satd. Flow (perm)	107	3386	0	192	1857	0	1641	1684	1531	0	1789	1641
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			6				84			117
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		760			228			667			232	
Travel Time (s)		17.3			5.2			15.2			5.3	
Lane Group Flow (vph)	5	1370	0	179	1349	0	92	94	352	0	109	43
Turn Type	Perm	NA		pm+pt	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases		6		5	2 5		8	8	5	4	4	
Permitted Phases	6			2 5					8			4
Total Split (s)	76.0	76.0		10.0			30.0	30.0	10.0	14.0	14.0	14.0
Total Lost Time (s)	6.5	6.5		4.0			6.5	6.5	4.0		6.5	6.5
Act Effct Green (s)	69.5	69.5		87.8	89.3		13.7	13.7	36.0		7.5	7.5
Actuated g/C Ratio	0.53	0.53		0.68	0.69		0.11	0.11	0.28		0.06	0.06
v/c Ratio	0.09	0.75		0.55	1.06		0.53	0.53	0.73		1.06	0.21
Control Delay	13.8	19.6		20.9	62.9		65.4	65.0	41.9		162.6	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0
Total Delay	13.8	19.6		20.9	62.9		65.4	65.0	41.9		162.6	2.4
LOS	B	B		C	E		E	E	D		F	A
Approach Delay		19.6			58.0			49.9			117.3	
Approach LOS		B			E			D			F	
Queue Length 50th (ft)	2	455		42	~1218		80	82	208		~100	0
Queue Length 95th (ft)	m2	209		#154	#1631		129	130	327		#223	0
Internal Link Dist (ft)		680			148			587			152	
Turn Bay Length (ft)	50						200		125			
Base Capacity (vph)	57	1819		326	1277		296	304	484		103	204
Starvation Cap Reductn	0	15		0	0		0	0	0		0	0
Spillback Cap Reductn	0	0		0	0		0	0	0		0	0
Storage Cap Reductn	0	0		0	0		0	0	0		0	0
Reduced v/c Ratio	0.09	0.76		0.55	1.06		0.31	0.31	0.73		1.06	0.21

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Total Split (s)	76.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 44.6	Intersection LOS: D
Intersection Capacity Utilization 107.0%	ICU Level of Service G
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 2: Second Avenue & Highland Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1090	170	165	1141	100	137	34	324	88	12	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	12	12	14
Total Lost time (s)	6.5	6.5		4.0	6.5		6.5	6.5	4.0		6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	1.00		0.95	0.95	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00		0.96	1.00
Satd. Flow (prot)	1745	3385		1805	1857		1641	1683	1531		1788	1641
Flt Permitted	0.06	1.00		0.10	1.00		0.95	0.97	1.00		0.96	1.00
Satd. Flow (perm)	106	3385		192	1857		1641	1683	1531		1788	1641
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	1185	185	179	1240	109	149	37	352	96	13	43
RTOR Reduction (vph)	0	10	0	0	2	0	0	0	65	0	0	41
Lane Group Flow (vph)	5	1360	0	179	1347	0	92	94	287	0	109	2
Heavy Vehicles (%)	0%	1%	1%	0%	1%	2%	1%	0%	2%	2%	0%	5%
Turn Type	Perm	NA		pm+pt	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases		6		5	2 5		8	8	5	4	4	
Permitted Phases	6			2 5					8			4
Actuated Green, G (s)	69.5	69.5		85.3	89.3		13.7	13.7	29.5		7.5	7.5
Effective Green, g (s)	69.5	69.5		85.3	85.3		13.7	13.7	29.5		7.5	7.5
Actuated g/C Ratio	0.53	0.53		0.66	0.66		0.11	0.11	0.23		0.06	0.06
Clearance Time (s)	6.5	6.5		4.0			6.5	6.5	4.0		6.5	6.5
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	56	1809		322	1218		172	177	347		103	94
v/s Ratio Prot		0.40		0.07	c0.73		0.06	0.06	c0.10		c0.06	
v/s Ratio Perm	0.05			0.30					0.09			0.00
v/c Ratio	0.09	0.75		0.56	1.11		0.53	0.53	0.83		1.06	0.03
Uniform Delay, d1	14.8	23.5		17.0	22.4		55.1	55.1	47.8		61.2	57.8
Progression Factor	0.69	0.72		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.7	2.5		1.2	59.9		1.6	1.5	14.2		105.3	0.0
Delay (s)	12.8	19.6		18.2	82.3		56.7	56.6	62.0		166.5	57.8
Level of Service	B	B		B	F		E	E	E		F	E
Approach Delay (s)		19.5			74.8			60.2			135.8	
Approach LOS		B			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	54.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	107.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	334	599	2	16	591	31	8	1	2	45	1	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	11	10	13	15	15	14	14	14
Storage Length (ft)	315		180	150		0	100		0	0		150
Storage Lanes	1		1	1		0	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt			0.850		0.992			0.950				0.850
Flt Protected	0.950			0.950			0.950	0.976			0.953	
Satd. Flow (prot)	3054	3490	1561	1685	3425	0	1772	1699	0	0	1775	1723
Flt Permitted	0.950			0.950			0.950	0.976			0.953	
Satd. Flow (perm)	3054	3490	1561	1685	3425	0	1772	1699	0	0	1775	1723
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142		5			2				305
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		682			1017			566			1303	
Travel Time (s)		15.5			23.1			12.9			29.6	
Lane Group Flow (vph)	363	651	2	17	676	0	6	6	0	0	50	208
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	Free
Protected Phases	1	6	6 8	5	2		8	8		4	4	
Permitted Phases												Free
Total Split (s)	18.0	31.0		12.0	25.0		12.0	12.0		12.0	12.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Act Effct Green (s)	15.7	70.2	80.8	7.0	53.3		7.0	7.0			7.0	100.0
Actuated g/C Ratio	0.16	0.70	0.81	0.07	0.53		0.07	0.07			0.07	1.00
v/c Ratio	0.76	0.27	0.00	0.15	0.37		0.05	0.05			0.40	0.12
Control Delay	54.8	15.8	0.0	48.2	20.8		44.5	38.7			54.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	54.8	15.8	0.0	48.2	20.8		44.5	38.7			54.5	0.1
LOS	D	B	A	D	C		D	D			D	A
Approach Delay		29.7			21.5			41.6			10.7	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	119	33	0	11	67		4	2			31	0
Queue Length 95th (ft)	#208	277	m0	m32	#330		17	15			70	0
Internal Link Dist (ft)		602			937			486			1223	
Turn Bay Length (ft)	315		180	150			100					150
Base Capacity (vph)	478	2448	1288	117	1827		124	120			125	1723
Starvation Cap Reductn	0	0	0	0	0		0	0			0	0
Spillback Cap Reductn	0	0	0	0	0		0	0			0	0
Storage Cap Reductn	0	0	0	0	0		0	0			0	0
Reduced v/c Ratio	0.76	0.27	0.00	0.15	0.37		0.05	0.05			0.40	0.12

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Total Split (s)	33.0
Total Lost Time (s)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

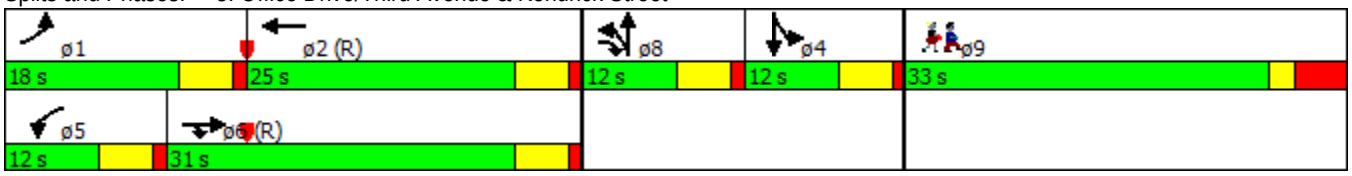
Intersection Summary

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 48.6%	ICU Level of Service A
Analysis Period (min) 15	

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

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

Splits and Phases: 3: Office Drive/Third Avenue & Kendrick Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	334	599	2	16	591	31	8	1	2	45	1	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	10	13	15	15	14	14	14
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.95	0.95			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
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	0.99		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98			0.95	1.00
Satd. Flow (prot)	3054	3490	1561	1685	3427		1772	1699			1775	1723
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98			0.95	1.00
Satd. Flow (perm)	3054	3490	1561	1685	3427		1772	1699			1775	1723
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	363	651	2	17	642	34	9	1	2	49	1	208
RTOR Reduction (vph)	0	0	1	0	3	0	0	2	0	0	0	0
Lane Group Flow (vph)	363	651	1	17	673	0	6	4	0	0	50	208
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	7%	0%	0%	0%	1%	0%	0%	50%	0%	9%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	Free
Protected Phases	1	6	6 8	5	2		8	8		4	4	
Permitted Phases												Free
Actuated Green, G (s)	15.7	57.4	65.2	2.8	44.5		2.8	2.8			5.6	100.0
Effective Green, g (s)	15.7	57.4	65.2	2.8	44.5		2.8	2.8			5.6	100.0
Actuated g/C Ratio	0.16	0.57	0.65	0.03	0.44		0.03	0.03			0.06	1.00
Clearance Time (s)	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	
Lane Grp Cap (vph)	479	2003	1017	47	1525		49	47			99	1723
v/s Ratio Prot	c0.12	0.19	0.00	0.01	c0.20		0.00	0.00			c0.03	
v/s Ratio Perm												c0.12
v/c Ratio	0.76	0.33	0.00	0.36	0.44		0.12	0.09			0.51	0.12
Uniform Delay, d1	40.3	11.2	6.1	47.7	19.2		47.4	47.4			45.9	0.0
Progression Factor	1.07	1.25	1.00	1.03	1.06		1.00	1.00			1.00	1.00
Incremental Delay, d2	6.0	0.4	0.0	1.7	0.9		0.4	0.3			1.5	0.1
Delay (s)	49.3	14.3	6.1	51.0	21.2		47.8	47.6			47.3	0.1
Level of Service	D	B	A	D	C		D	D			D	A
Approach Delay (s)		26.8			21.9			47.7			9.3	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

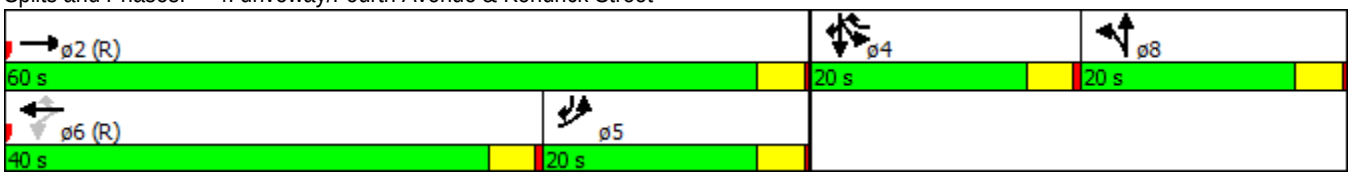
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	159	480	1	2	429	222	3	1	4	131	1	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	14	14	14	13	13	16
Storage Length (ft)	200		0	0		200	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00				0.98						
Frt						0.850		0.932				0.850
Flt Protected	0.950							0.982			0.953	
Satd. Flow (prot)	1805	3574	0	0	2132	1794	0	1855	0	0	1817	1794
Flt Permitted	0.950				0.999			0.982			0.953	
Satd. Flow (perm)	1805	3574	0	0	2130	1757	0	1855	0	0	1817	1794
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						241		4				145
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1017			576			212			157	
Travel Time (s)		23.1			13.1			4.8			3.6	
Lane Group Flow (vph)	173	523	0	0	468	241	0	8	0	0	143	145
Turn Type	Prot	NA		Perm	NA	pm+ov	Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6	4	8	8		4	4	4 5
Permitted Phases				6		6						
Total Split (s)	20.0	60.0		40.0	40.0	20.0	20.0	20.0		20.0	20.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Act Effct Green (s)	14.8	76.9			58.1	71.0		7.0			12.9	31.7
Actuated g/C Ratio	0.15	0.77			0.58	0.71		0.07			0.13	0.32
v/c Ratio	0.65	0.19			0.38	0.18		0.06			0.61	0.22
Control Delay	41.5	1.6			14.8	1.0		35.0			52.1	4.2
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	0.0
Total Delay	41.5	1.6			14.8	1.0		35.0			52.1	4.2
LOS	D	A			B	A		C			D	A
Approach Delay		11.5			10.1			35.0			28.0	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	106	22			141	0		2			87	0
Queue Length 95th (ft)	190	17			321	19		17			146	36
Internal Link Dist (ft)		937			496			132			77	
Turn Bay Length (ft)	200					200						
Base Capacity (vph)	308	2749			1237	1355		300			290	708
Starvation Cap Reductn	0	0			0	0		0			0	0
Spillback Cap Reductn	0	0			0	0		0			0	0
Storage Cap Reductn	0	0			0	0		0			0	0
Reduced v/c Ratio	0.56	0.19			0.38	0.18		0.03			0.49	0.20

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 60.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: driveway/Fourth Avenue & Kendrick Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	159	480	1	2	429	222	3	1	4	131	1	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	14	14	14	13	13	16
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.98		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	1.00			1.00	0.85		0.93			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		0.98			0.95	1.00
Satd. Flow (prot)	1805	3573			2132	1765		1855			1816	1794
Flt Permitted	0.95	1.00			1.00	1.00		0.98			0.95	1.00
Satd. Flow (perm)	1805	3573			2129	1765		1855			1816	1794
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	173	522	1	2	466	241	3	1	4	142	1	145
RTOR Reduction (vph)	0	0	0	0	0	78	0	4	0	0	0	99
Lane Group Flow (vph)	173	523	0	0	468	163	0	4	0	0	143	46
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	2%	0%	0%	0%	3%	0%	2%
Turn Type	Prot	NA		Perm	NA	pm+ov	Split	NA		Split	NA	pt+ov
Protected Phases	5	2			6	4	8	8		4	4	4 5
Permitted Phases				6		6						
Actuated Green, G (s)	14.8	73.7			54.9	67.8		1.4			12.9	31.7
Effective Green, g (s)	14.8	73.7			54.9	67.8		1.4			12.9	31.7
Actuated g/C Ratio	0.15	0.74			0.55	0.68		0.01			0.13	0.32
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	267	2633			1168	1196		25			234	568
v/s Ratio Prot	c0.10	0.15				0.02		c0.00			c0.08	0.03
v/s Ratio Perm					c0.22	0.07						
v/c Ratio	0.65	0.20			0.40	0.14		0.16			0.61	0.08
Uniform Delay, d1	40.1	4.1			13.0	5.7		48.7			41.2	23.9
Progression Factor	0.77	0.38			1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	5.2	0.2			1.0	0.1		3.0			4.7	0.1
Delay (s)	36.1	1.7			14.1	5.8		51.8			45.8	24.0
Level of Service	D	A			B	A		D			D	C
Approach Delay (s)		10.2			11.2			51.8			34.8	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group