

APPENDIX E

Detailed Capacity Analysis

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2025 Existing PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	472	182	238	418	6	137	299	135	4	208	39
Future Volume (vph)	69	472	182	238	418	6	137	299	135	4	208	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.958			0.998			0.953			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1774	0	1807	1862	0	1807	1789	0	1217	1859	0
Flt Permitted	0.505			0.094			0.300			0.360		
Satd. Flow (perm)	924	1774	0	179	1862	0	571	1789	0	461	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			20			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	3%	1%	3%	0%	1%	2%	3%	50%	1%	0%
Adj. Flow (vph)	73	497	192	251	440	6	144	315	142	4	219	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	689	0	251	446	0	144	457	0	4	260	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	61.6	61.6		17.0	78.6		13.4	41.4		28.0	28.0	
Total Split (%)	51.3%	51.3%		14.2%	65.5%		11.2%	34.5%		23.3%	23.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effct Green (s)	46.2	46.2		62.6	62.6		37.3	37.3		24.1	24.1	
Actuated g/C Ratio	0.42	0.42		0.57	0.57		0.34	0.34		0.22	0.22	
v/c Ratio	0.19	0.90		0.90	0.42		0.49	0.73		0.04	0.63	
Control Delay (s/veh)	20.2	44.2		57.8	13.8		34.9	40.4		40.3	47.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	20.2	44.2		57.8	13.8		34.9	40.4		40.3	47.4	
LOS	C	D		E	B		C	D		D	D	
Approach Delay (s/veh)		41.9			29.7			39.1			47.3	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	9.5	130.7		33.9	49.3		22.6	84.2		0.7	50.6	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2025 Existing PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	19.0	183.4		#82.7	69.5		42.3	#145.1		4.0	85.0	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	489	949		291	1279		297	625		102	416	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.73		0.86	0.35		0.48	0.73		0.04	0.63	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 109

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay (s/veh): 38.1

Intersection LOS: D

Intersection Capacity Utilization 92.2%

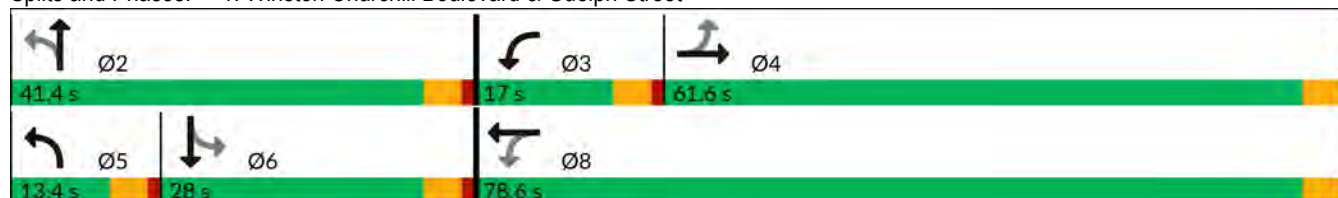
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



Lanes, Volumes, Timings
2: Existing Site Access/Noble Street & Guelph Street

2025 Existing PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	609	0	3	614	8	0	0	0	2	0	15
Future Volume (vph)	0	609	0	3	614	8	0	0	0	2	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt	0.998											0.880
Flt Protected												0.994
Satd. Flow (prot)	0	1847	0	0	1862	0	0	1883	0	0	1680	0
Flt Permitted												0.994
Satd. Flow (perm)	0	1847	0	0	1862	0	0	1883	0	0	1680	0
Link Speed (k/h)	50				50				48			
Link Distance (m)	103.0				183.8				116.7			
Travel Time (s)	7.4				13.2				8.8			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	2%	0%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	0	641	0	3	646	8	0	0	0	2	0	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	641	0	0	657	0	0	0	0	0	18	0
Sign Control	Free			Free				Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	45.2%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2025 Existing PM
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	609	0	3	614	8	0	0	0	2	0	15
Future Volume (Veh/h)	0	609	0	3	614	8	0	0	0	2	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	641	0	3	646	8	0	0	0	2	0	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)	103											
pX, platoon unblocked				0.66			0.66	0.66	0.66	0.66	0.66	
vC, conflicting volume	654			641			1313	1301	641	1297	1297	650
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	654			199			1217	1199	199	1193	1193	650
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			100			100	100	100	98	100	97
cM capacity (veh/h)	933			915			100	122	556	109	123	473
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	641	657	0	18								
Volume Left	0	3	0	2								
Volume Right	0	8	0	16								
cSH	933	915	1700	345								
Volume to Capacity	0.00	0.00	0.00	0.05								
Queue Length 95th (m)	0.0	0.1	0.0	1.3								
Control Delay (s/veh)	0.0	0.1	0.0	16.0								
Lane LOS		A	A	C								
Approach Delay (s/veh)	0.0	0.1	0.0	16.0								
Approach LOS			A	C								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			45.2%	ICU Level of Service					A			
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.4	172.9	75.0	85.7	87.5	156.0	19.9	94.6
Average Queue (m)	22.3	106.1	41.2	44.8	36.3	83.5	2.8	48.7
95th Queue (m)	69.1	169.5	70.1	76.5	79.6	145.2	12.2	80.6
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		2	0	1		3		1
Queuing Penalty (veh)		0	0	9		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)		17	0	2	0	13		1
Queuing Penalty (veh)		12	1	4	0	18		0

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	47.7	9.8
Average Queue (m)	4.1	3.3
95th Queue (m)	29.4	9.7
Link Distance (m)	179.0	88.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 43

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2025 Existing SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	476	203	231	414	9	196	75	153	55	26	28
Future Volume (vph)	32	476	203	231	414	9	196	75	153	55	26	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.955			0.997			0.900			0.922	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1822	0	1825	1879	0	1807	1695	0	1825	1738	0
Flt Permitted	0.498			0.077			0.591			0.605		
Satd. Flow (perm)	957	1822	0	148	1879	0	1124	1695	0	1162	1738	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			2			85			30	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	2%	2%	0%	4%	0%
Adj. Flow (vph)	35	517	221	251	450	10	213	82	166	60	28	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	738	0	251	460	0	213	248	0	60	58	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	62.0	62.0		19.0	81.0		14.1	39.0		24.9	24.9	
Total Split (%)	51.7%	51.7%		15.8%	67.5%		11.8%	32.5%		20.8%	20.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effct Green (s)	47.6	47.6		64.9	64.9		34.9	34.9		20.7	20.7	
Actuated g/C Ratio	0.44	0.44		0.60	0.60		0.32	0.32		0.19	0.19	
v/c Ratio	0.08	0.91		0.88	0.41		0.51	0.41		0.27	0.16	
Control Delay (s/veh)	17.9	44.1		58.5	12.5		36.4	23.1		45.8	25.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	17.9	44.1		58.5	12.5		36.4	23.1		45.8	25.2	
LOS	B	D		E	B		D	C		D	C	
Approach Delay (s/veh)		43.0			28.8			29.3			35.7	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	4.3	141.1		37.1	48.0		37.0	28.0		11.6	5.2	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2025 Existing SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	10.3	199.0		#82.3	67.5		62.9	55.0		25.7	17.5	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	511	985		314	1336		421	601		221	355	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.75		0.80	0.34		0.51	0.41		0.27	0.16	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 108.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay (s/veh): 34.6

Intersection LOS: C

Intersection Capacity Utilization 82.7%

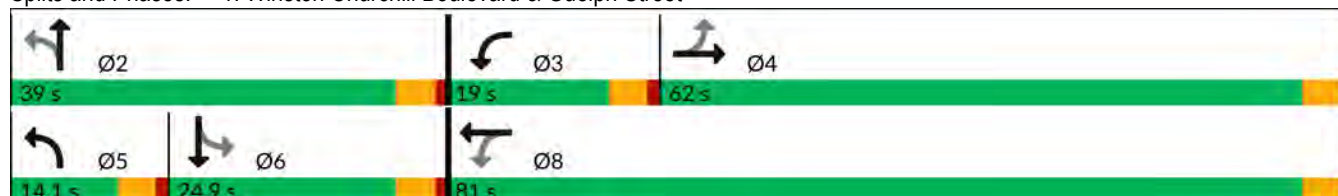
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



Lanes, Volumes, Timings
2: Existing Site Access/Noble Street & Guelph Street

2025 Existing SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	696	5	0	651	6	3	0	0	19	0	1
Future Volume (vph)	2	696	5	0	651	6	3	0	0	19	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.999			0.999						0.994	
Flt Protected								0.950			0.955	
Satd. Flow (prot)	0	1900	0	0	1900	0	0	1825	0	0	1824	0
Flt Permitted								0.950			0.955	
Satd. Flow (perm)	0	1900	0	0	1900	0	0	1825	0	0	1824	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	2	740	5	0	693	6	3	0	0	20	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	747	0	0	699	0	0	3	0	0	21	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.5% ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2025 Existing SAT
08/01/2025

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	2	696	5	0	651	6	3	0	0	19	0	1	
Future Volume (Veh/h)	2	696	5	0	651	6	3	0	0	19	0	1	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	2	740	5	0	693	6	3	0	0	20	0	1	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None			None									
Median storage (veh)													
Upstream signal (m)	103												
pX, platoon unblocked				0.63			0.63	0.63	0.63	0.63	0.63		
vC, conflicting volume	699			745			1444	1446	743	1443	1445	696	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	699			298			1410	1413	294	1408	1412	696	
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			100			96	100	100	73	100	100	
cM capacity (veh/h)	907			793			73	86	468	74	86	445	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	747	699	3	21									
Volume Left	2	0	3	20									
Volume Right	5	6	0	1									
cSH	907	793	73	77									
Volume to Capacity	0.00	0.00	0.04	0.27									
Queue Length 95th (m)	0.1	0.0	1.0	7.5									
Control Delay (s/veh)	0.1	0.0	56.2	68.8									
Lane LOS	A		F	F									
Approach Delay (s/veh)	0.1	0.0	56.2	68.8									
Approach LOS			F	F									
Intersection Summary													
Average Delay			1.1										
Intersection Capacity Utilization			48.5%	ICU Level of Service							A		
Analysis Period (min)			15										

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	76.8	173.1	73.6	77.4	61.9	69.2	31.6	24.4
Average Queue (m)	12.3	100.5	36.5	36.9	32.1	30.7	14.1	9.4
95th Queue (m)	51.8	160.0	61.5	63.9	53.0	56.6	27.6	19.9
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		1	0	0				
Queuing Penalty (veh)		0	0	1				
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	15	0	0	0	0		
Queuing Penalty (veh)	0	5	0	1	0	0		

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	11.2	4.4	8.2	16.0
Average Queue (m)	0.4	0.1	0.7	4.7
95th Queue (m)	3.8	3.1	4.3	13.3
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 6

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2026 Future Background PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	482	186	243	427	7	140	305	138	5	213	40
Future Volume (vph)	71	482	186	243	427	7	140	305	138	5	213	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.958			0.998			0.953			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1774	0	1807	1862	0	1807	1789	0	1217	1859	0
Flt Permitted	0.500			0.088			0.285			0.336		
Satd. Flow (perm)	915	1774	0	167	1862	0	542	1789	0	430	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			20			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	3%	1%	3%	0%	1%	2%	3%	50%	1%	0%
Adj. Flow (vph)	75	507	196	256	449	7	147	321	145	5	224	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	703	0	256	456	0	147	466	0	5	266	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	61.6	61.6		17.0	78.6		13.4	41.4		28.0	28.0	
Total Split (%)	51.3%	51.3%		14.2%	65.5%		11.2%	34.5%		23.3%	23.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effct Green (s)	47.3	47.3		63.9	63.9		37.2	37.2		24.0	24.0	
Actuated g/C Ratio	0.43	0.43		0.58	0.58		0.34	0.34		0.22	0.22	
v/c Ratio	0.19	0.91		0.93	0.42		0.52	0.76		0.05	0.65	
Control Delay (s/veh)	20.2	45.1		65.9	13.8		36.4	42.1		40.8	48.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	20.2	45.1		65.9	13.8		36.4	42.1		40.8	48.8	
LOS	C	D		E	B		D	D		D	D	
Approach Delay (s/veh)		42.7			32.5			40.7			48.7	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	9.8	135.0		37.1	50.8		23.7	88.8		0.9	53.1	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2026 Future Background PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	19.6	189.8		#88.3	71.4		42.9	#149.6		4.7	#87.9	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	478	938		284	1263		286	617		93	410	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.16	0.75		0.90	0.36		0.51	0.76		0.05	0.65	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 110.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay (s/veh): 39.8

Intersection LOS: D

Intersection Capacity Utilization 93.8%

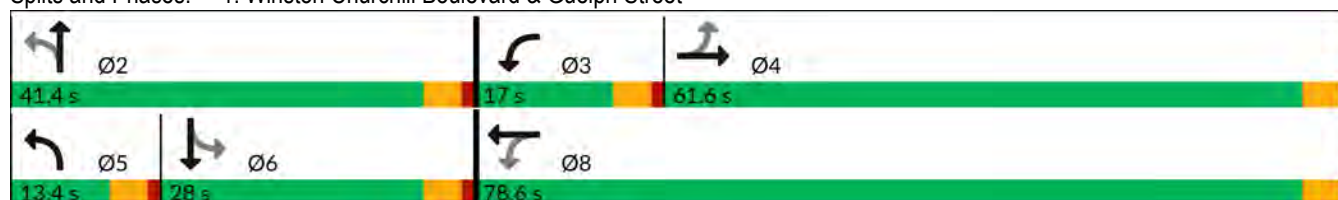
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	622	0	4	627	9	0	0	0	3	0	16
Future Volume (vph)	0	622	0	4	627	9	0	0	0	3	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt	0.998										0.885	
Flt Protected											0.993	
Satd. Flow (prot)	0	1847	0	0	1862	0	0	1883	0	0	1688	0
Flt Permitted											0.993	
Satd. Flow (perm)	0	1847	0	0	1862	0	0	1883	0	0	1688	0
Link Speed (k/h)	50				50				48			
Link Distance (m)	103.0				183.8				116.7			
Travel Time (s)	7.4				13.2				8.8			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	2%	0%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	0	655	0	4	660	9	0	0	0	3	0	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	655	0	0	673	0	0	0	0	0	20	0
Sign Control	Free				Free				Stop			
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	46.7%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2026 Future Background PM

08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	622	0	4	627	9	0	0	0	3	0	16
Future Volume (Veh/h)	0	622	0	4	627	9	0	0	0	3	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	655	0	4	660	9	0	0	0	3	0	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	103											
pX, platoon unblocked				0.65				0.65	0.65	0.65	0.65	0.65
vC, conflicting volume	669			655			1345	1332	655	1328	1328	665
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	669			202			1261	1242	202	1235	1235	665
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			100			100	100	100	97	100	96
cM capacity (veh/h)	921			900			92	113	546	100	114	464
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	655	673	0	20								
Volume Left	0	4	0	3								
Volume Right	0	9	0	17								
cSH	921	900	1700	301								
Volume to Capacity	0.00	0.00	0.00	0.07								
Queue Length 95th (m)	0.0	0.1	0.0	1.6								
Control Delay (s/veh)	0.0	0.1	0.0	17.8								
Lane LOS		A	A	C								
Approach Delay (s/veh)	0.0	0.1	0.0	17.8								
Approach LOS			A	C								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			46.7%	ICU Level of Service					A			
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	175.3	79.6	91.5	87.5	161.4	32.9	97.8
Average Queue (m)	27.9	114.1	45.2	46.2	42.2	94.4	4.8	48.2
95th Queue (m)	82.2	178.1	75.4	84.0	89.6	164.4	20.0	81.3
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		5	1	4		8		0
Queuing Penalty (veh)		0	0	27		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	22	2	5	0	18		1
Queuing Penalty (veh)	0	15	7	11	2	26		0

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	86.4	12.7
Average Queue (m)	8.6	4.3
95th Queue (m)	52.4	11.2
Link Distance (m)	179.0	88.2
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 88

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	486	208	236	423	10	200	77	157	57	27	29
Future Volume (vph)	33	486	208	236	423	10	200	77	157	57	27	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.955			0.996			0.899			0.921	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1822	0	1825	1877	0	1807	1693	0	1825	1736	0
Flt Permitted	0.493			0.074			0.589			0.601		
Satd. Flow (perm)	947	1822	0	142	1877	0	1120	1693	0	1155	1736	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			2			86			32	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	2%	2%	0%	4%	0%
Adj. Flow (vph)	36	528	226	257	460	11	217	84	171	62	29	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	754	0	257	471	0	217	255	0	62	61	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	62.0	62.0		19.0	81.0		14.1	39.0		24.9	24.9	
Total Split (%)	51.7%	51.7%		15.8%	67.5%		11.8%	32.5%		20.8%	20.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effct Green (s)	49.1	49.1		66.7	66.7		34.9	34.9		20.7	20.7	
Actuated g/C Ratio	0.44	0.44		0.60	0.60		0.32	0.32		0.19	0.19	
v/c Ratio	0.09	0.92		0.90	0.42		0.53	0.43		0.29	0.17	
Control Delay (s/veh)	17.9	45.0		62.8	12.5		37.7	24.0		46.8	25.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	17.9	45.0		62.8	12.5		37.7	24.0		46.8	25.2	
LOS	B	D		E	B		D	C		D	C	
Approach Delay (s/veh)		43.8			30.3			30.3			36.1	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	4.5	147.8		40.3	49.6		39.8	30.9		12.5	5.7	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2026 Future Background SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	10.6	#213.8		#86.9	69.5		64.1	56.7		26.5	17.9	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	497	968		308	1311		412	592		215	350	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.78		0.83	0.36		0.53	0.43		0.29	0.17	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 110.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay (s/veh): 35.7

Intersection LOS: D

Intersection Capacity Utilization 84.2%

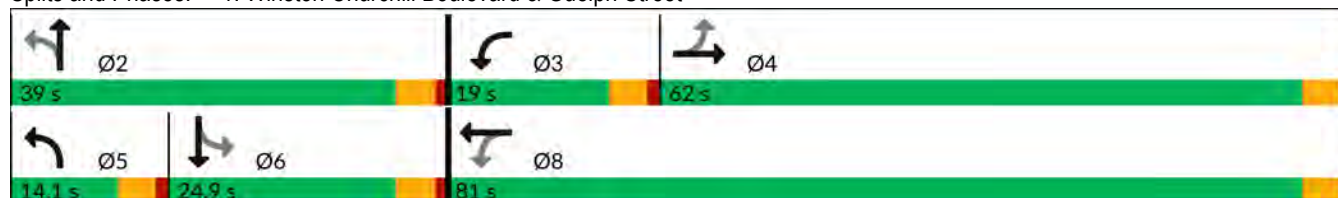
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	710	6	0	665	7	4	0	0	20	0	2
Future Volume (vph)	3	710	6	0	665	7	4	0	0	20	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.999			0.999						0.988	
Flt Protected								0.950			0.956	
Satd. Flow (prot)	0	1900	0	0	1900	0	0	1825	0	0	1815	0
Flt Permitted								0.950			0.956	
Satd. Flow (perm)	0	1900	0	0	1900	0	0	1825	0	0	1815	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	3	755	6	0	707	7	4	0	0	21	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	764	0	0	714	0	0	4	0	0	23	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 50.1%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis 2: Existing Site Access/Noble Street & Guelph Street

2026 Future Background SAT
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	710	6	0	665	7	4	0	0	20	0	2
Future Volume (Veh/h)	3	710	6	0	665	7	4	0	0	20	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	755	6	0	707	7	4	0	0	21	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		103										
pX, platoon unblocked				0.62			0.62	0.62	0.62	0.62	0.62	
vC, conflicting volume	714			761			1477	1478	758	1475	1478	711
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	714			301			1462	1464	296	1459	1463	711
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			100			94	100	100	68	100	100
cM capacity (veh/h)	895			777			66	79	458	67	79	437
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	764	714	4	23								
Volume Left	3	0	4	21								
Volume Right	6	7	0	2								
cSH	895	777	66	72								
Volume to Capacity	0.00	0.00	0.06	0.32								
Queue Length 95th (m)	0.1	0.0	1.4	9.0								
Control Delay (s/veh)	0.1	0.0	63.0	77.0								
Lane LOS	A		F	F								
Approach Delay (s/veh)	0.1	0.0	63.0	77.0								
Approach LOS			F	F								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			50.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	77.0	173.1	71.1	79.6	67.2	73.2	30.2	29.5
Average Queue (m)	15.2	102.4	37.9	39.0	34.5	33.4	13.3	9.9
95th Queue (m)	59.9	160.1	64.2	68.8	60.0	62.2	26.3	22.0
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		2	0	0				
Queuing Penalty (veh)		0	0	1				
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)		16	0	0	0	0		
Queuing Penalty (veh)		5	0	0	0	0		

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	18.0	6.2	8.3	15.8
Average Queue (m)	0.9	0.2	0.9	4.9
95th Queue (m)	9.7	2.8	4.9	12.6
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 7

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2031 Future Background PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	532	205	269	471	7	155	337	153	5	235	44
Future Volume (vph)	78	532	205	269	471	7	155	337	153	5	235	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.958			0.998			0.953			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1774	0	1807	1862	0	1807	1789	0	1217	1859	0
Flt Permitted	0.479			0.070			0.210			0.196		
Satd. Flow (perm)	876	1774	0	133	1862	0	399	1789	0	251	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			20			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	3%	1%	3%	0%	1%	2%	3%	50%	1%	0%
Adj. Flow (vph)	82	560	216	283	496	7	163	355	161	5	247	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	776	0	283	503	0	163	516	0	5	293	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	61.6	61.6		17.0	78.6		13.4	41.4		28.0	28.0	
Total Split (%)	51.3%	51.3%		14.2%	65.5%		11.2%	34.5%		23.3%	23.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effct Green (s)	52.8	52.8		69.9	69.9		37.0	37.0		23.6	23.6	
Actuated g/C Ratio	0.46	0.46		0.60	0.60		0.32	0.32		0.20	0.20	
v/c Ratio	0.21	0.95		1.08	0.45		0.69	0.88		0.10	0.77	
Control Delay (s/veh)	20.1	50.6		111.9	13.9		48.0	55.1		45.2	57.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	20.1	50.6		111.9	13.9		48.0	55.1		45.2	57.8	
LOS	C	D		F	B		D	E		D	E	
Approach Delay (s/veh)		47.7			49.1			53.4			57.6	
Approach LOS		D			D			D			E	
Queue Length 50th (m)	10.9	160.7		~58.8	58.0		29.2	113.1		1.0	64.8	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2031 Future Background PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	21.4	#240.8		#113.1	81.1		#53.5	#177.0		4.8	#105.3	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	432	887		261	1194		236	584		51	383	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.87		1.08	0.42		0.69	0.88		0.10	0.77	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 115.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay (s/veh): 50.7

Intersection LOS: D

Intersection Capacity Utilization 101.6%

ICU Level of Service G

Analysis Period (min) 15

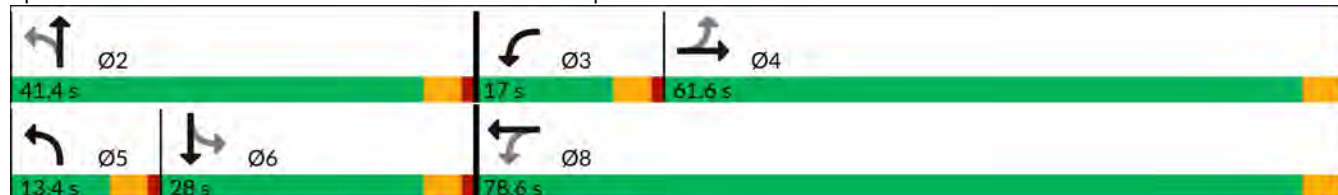
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	686	0	4	692	10	0	0	0	3	0	17
Future Volume (vph)	0	686	0	4	692	10	0	0	0	3	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt					0.998						0.884	
Flt Protected											0.993	
Satd. Flow (prot)	0	1847	0	0	1863	0	0	1883	0	0	1686	0
Flt Permitted											0.993	
Satd. Flow (perm)	0	1847	0	0	1863	0	0	1883	0	0	1686	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	2%	0%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	0	722	0	4	728	11	0	0	0	3	0	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	722	0	0	743	0	0	0	0	0	21	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 50.2%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2031 Future Background PM
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	686	0	4	692	10	0	0	0	3	0	17
Future Volume (Veh/h)	0	686	0	4	692	10	0	0	0	3	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	722	0	4	728	11	0	0	0	3	0	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	103											
pX, platoon unblocked				0.60				0.60	0.60	0.60	0.60	0.60
vC, conflicting volume	739			722			1482	1469	722	1464	1464	734
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	739			205			1469	1448	205	1439	1439	734
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			100			100	100	100	96	100	96
cM capacity (veh/h)	867			828			60	78	502	67	79	424
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	722	743	0	21								
Volume Left	0	4	0	3								
Volume Right	0	11	0	18								
cSH	867	828	1700	241								
Volume to Capacity	0.00	0.00	0.00	0.09								
Queue Length 95th (m)	0.0	0.1	0.0	2.2								
Control Delay (s/veh)	0.0	0.1	0.0	21.4								
Lane LOS		A	A	C								
Approach Delay (s/veh)	0.0	0.1	0.0	21.4								
Approach LOS			A	C								
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			50.2%	ICU Level of Service				A				
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	182.4	83.0	99.8	87.6	176.9	49.0	105.4
Average Queue (m)	40.6	158.9	68.0	73.2	68.7	162.5	8.3	64.5
95th Queue (m)	102.8	208.7	96.8	115.7	113.4	195.8	32.0	104.5
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		36	7	26		59		6
Queuing Penalty (veh)		0	0	187		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	44	13	28	2	63	0	11
Queuing Penalty (veh)	0	34	64	75	8	97	0	1

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	153.7	39.9
Average Queue (m)	66.5	11.6
95th Queue (m)	182.7	40.8
Link Distance (m)	179.0	88.2
Upstream Blk Time (%)	10	2
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 465

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	537	229	261	467	11	221	85	173	62	30	32
Future Volume (vph)	37	537	229	261	467	11	221	85	173	62	30	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.955			0.997			0.899			0.923	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1822	0	1825	1879	0	1807	1693	0	1825	1739	0
Flt Permitted	0.471			0.067			0.584			0.588		
Satd. Flow (perm)	905	1822	0	129	1879	0	1111	1693	0	1130	1739	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			2			86			35	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	2%	2%	0%	4%	0%
Adj. Flow (vph)	40	584	249	284	508	12	240	92	188	67	33	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	833	0	284	520	0	240	280	0	67	68	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	62.0	62.0		19.0	81.0		14.1	39.0		24.9	24.9	
Total Split (%)	51.7%	51.7%		15.8%	67.5%		11.8%	32.5%		20.8%	20.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effct Green (s)	55.1	55.1		74.1	74.1		34.6	34.6		20.4	20.4	
Actuated g/C Ratio	0.47	0.47		0.63	0.63		0.29	0.29		0.17	0.17	
v/c Ratio	0.09	0.96		0.98	0.44		0.63	0.50		0.34	0.21	
Control Delay (s/veh)	17.9	52.6		81.3	12.4		43.5	27.5		49.5	25.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	17.9	52.6		81.3	12.4		43.5	27.5		49.5	25.7	
LOS	B	D		F	B		D	C		D	C	
Approach Delay (s/veh)		51.0			36.7			34.9			37.5	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	5.0	177.0		50.7	56.6		46.4	37.7		14.1	6.7	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2031 Future Background SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	11.5	#262.6		#105.7	78.9		70.8	64.3		28.3	19.4	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	442	905		290	1224		383	558		196	330	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.92		0.98	0.42		0.63	0.50		0.34	0.21	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 117.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay (s/veh): 41.7

Intersection LOS: D

Intersection Capacity Utilization 90.9%

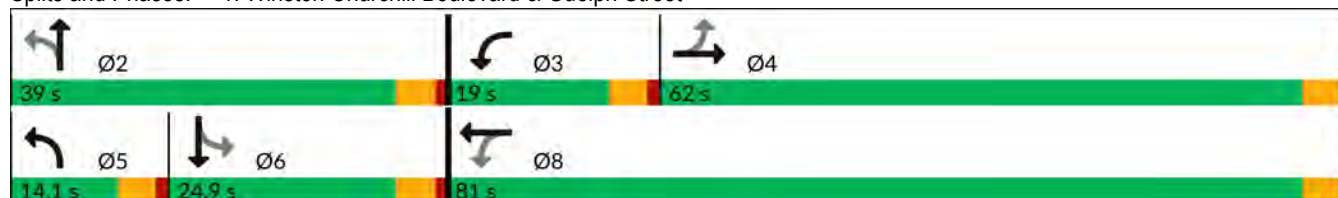
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	784	6	0	734	7	4	0	0	22	0	2
Future Volume (vph)	3	784	6	0	734	7	4	0	0	22	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.999			0.999						0.989	
Flt Protected								0.950			0.956	
Satd. Flow (prot)	0	1900	0	0	1900	0	0	1825	0	0	1816	0
Flt Permitted								0.950			0.956	
Satd. Flow (perm)	0	1900	0	0	1900	0	0	1825	0	0	1816	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	3	834	6	0	781	7	4	0	0	23	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	843	0	0	788	0	0	4	0	0	25	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.0%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis 2: Existing Site Access/Noble Street & Guelph Street

2031 Future Background SAT
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	784	6	0	734	7	4	0	0	22	0	2
Future Volume (Veh/h)	3	784	6	0	734	7	4	0	0	22	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	834	6	0	781	7	4	0	0	23	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		103										
pX, platoon unblocked				0.55			0.55	0.55	0.55	0.55	0.55	
vC, conflicting volume	788			840			1630	1631	837	1628	1631	785
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	788			306			1734	1737	300	1731	1736	785
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			100			90	100	100	40	100	99
cM capacity (veh/h)	840			694			38	48	409	39	48	396
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	843	788	4	25								
Volume Left	3	0	4	23								
Volume Right	6	7	0	2								
cSH	840	694	38	42								
Volume to Capacity	0.00	0.00	0.10	0.60								
Queue Length 95th (m)	0.1	0.0	2.5	16.7								
Control Delay (s/veh)	0.1	0.0	110.1	179.3								
Lane LOS	A		F	F								
Approach Delay (s/veh)	0.1	0.0	110.1	179.3								
Approach LOS			F	F								
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			54.0%	ICU Level of Service					A			
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	177.7	79.5	91.1	79.4	85.8	53.1	32.8
Average Queue (m)	20.9	159.6	53.3	53.0	42.6	40.1	18.8	12.2
95th Queue (m)	76.7	209.1	84.8	93.1	70.8	70.1	41.8	26.4
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		48	2	7				
Queuing Penalty (veh)		0	0	51				
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)		50	4	8	0	0		
Queuing Penalty (veh)		18	19	20	1	1		

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	23.6	89.8	9.5	19.5
Average Queue (m)	1.2	18.4	1.1	5.4
95th Queue (m)	11.6	90.2	5.9	14.1
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 111

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2036 Future Background PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	587	227	296	520	8	171	372	168	5	259	49
Future Volume (vph)	86	587	227	296	520	8	171	372	168	5	259	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.958			0.998			0.953			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1774	0	1807	1862	0	1807	1789	0	1217	1859	0
Flt Permitted	0.456			0.065			0.143			0.170		
Satd. Flow (perm)	834	1774	0	124	1862	0	272	1789	0	218	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			20			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	3%	1%	3%	0%	1%	2%	3%	50%	1%	0%
Adj. Flow (vph)	91	618	239	312	547	8	180	392	177	5	273	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	857	0	312	555	0	180	569	0	5	325	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	61.6	61.6		17.0	78.6		13.4	41.4		28.0	28.0	
Total Split (%)	51.3%	51.3%		14.2%	65.5%		11.2%	34.5%		23.3%	23.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effct Green (s)	57.1	57.1		74.1	74.1		36.9	36.9		23.5	23.5	
Actuated g/C Ratio	0.48	0.48		0.62	0.62		0.31	0.31		0.20	0.20	
v/c Ratio	0.23	1.00		1.24	0.48		0.91	1.01		0.12	0.88	
Control Delay (s/veh)	20.5	62.6		169.0	14.2		80.3	80.9		47.6	71.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	20.5	62.6		169.0	14.2		80.3	80.9		47.6	71.2	
LOS	C	E		F	B		F	F		D	E	
Approach Delay (s/veh)		58.5			69.9			80.7			70.8	
Approach LOS		E			E			F			E	
Queue Length 50th (m)	12.3	~194.4		~75.5	66.5		32.6	~132.6		1.0	73.5	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2036 Future Background PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	23.6	#283.1		#131.4	92.2		#68.2	#205.5		4.9	#123.2	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	396	855		251	1150		197	563		42	369	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.23	1.00		1.24	0.48		0.91	1.01		0.12	0.88	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.24

Intersection Signal Delay (s/veh): 69.1

Intersection LOS: E

Intersection Capacity Utilization 110.1%

ICU Level of Service H

Analysis Period (min) 15

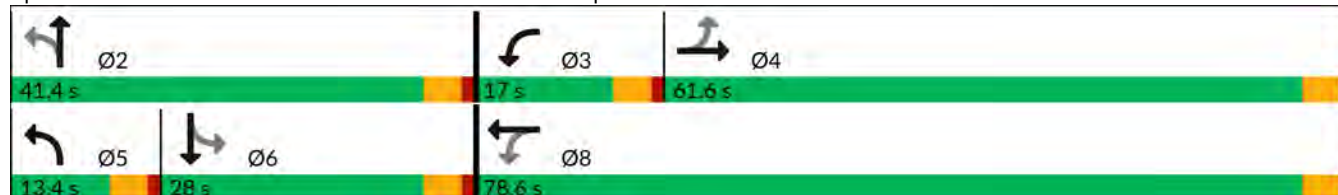
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	758	0	4	764	10	0	0	0	3	0	19
Future Volume (vph)	0	758	0	4	764	10	0	0	0	3	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt	0.998										0.883	
Flt Protected											0.994	
Satd. Flow (prot)	0	1847	0	0	1862	0	0	1883	0	0	1686	0
Flt Permitted											0.994	
Satd. Flow (perm)	0	1847	0	0	1862	0	0	1883	0	0	1686	0
Link Speed (k/h)	50				50				48			
Link Distance (m)	103.0				183.8				116.7			
Travel Time (s)	7.4				13.2				8.8			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	2%	0%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	0	798	0	4	804	11	0	0	0	3	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	798	0	0	819	0	0	0	0	0	23	0
Sign Control	Free				Free				Stop			
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	54.0%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis 2: Existing Site Access/Noble Street & Guelph Street

2036 Future Background PM
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	758	0	4	764	10	0	0	0	3	0	19
Future Volume (Veh/h)	0	758	0	4	764	10	0	0	0	3	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	798	0	4	804	11	0	0	0	3	0	20
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		103										
pX, platoon unblocked				0.55			0.55	0.55	0.55	0.55	0.55	
vC, conflicting volume	815			798			1636	1621	798	1616	1616	810
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	815			225			1746	1720	225	1710	1710	810
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			99			100	100	100	92	100	95
cM capacity (veh/h)	812			746			35	49	449	40	50	383
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	798	819	0	23								
Volume Left	0	4	0	3								
Volume Right	0	11	0	20								
cSH	812	746	1700	180								
Volume to Capacity	0.00	0.01	0.00	0.13								
Queue Length 95th (m)	0.0	0.1	0.0	3.3								
Control Delay (s/veh)	0.0	0.1	0.0	27.9								
Lane LOS		A	A	D								
Approach Delay (s/veh)	0.0	0.1	0.0	27.9								
Approach LOS			A	D								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			54.0%	ICU Level of Service						A		
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	184.3	83.1	102.1	87.6	176.8	63.9	113.1
Average Queue (m)	46.2	175.3	79.3	95.3	71.0	166.4	9.8	84.5
95th Queue (m)	112.5	181.0	90.5	103.7	114.2	184.7	37.8	125.2
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		60	16	54		69		22
Queuing Penalty (veh)		0	0	420		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	56	28	55	1	67	0	32
Queuing Penalty (veh)	0	48	149	164	5	115	0	2

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	196.8	77.2
Average Queue (m)	178.5	38.8
95th Queue (m)	226.5	86.5
Link Distance (m)	179.0	88.2
Upstream Blk Time (%)	68	7
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 903

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	592	253	288	515	12	244	94	191	69	33	35
Future Volume (vph)	40	592	253	288	515	12	244	94	191	69	33	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.955			0.997			0.899			0.923	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1822	0	1825	1879	0	1807	1693	0	1825	1739	0
Flt Permitted	0.449			0.065			0.581			0.572		
Satd. Flow (perm)	863	1822	0	125	1879	0	1105	1693	0	1099	1739	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			2			86			38	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	2%	2%	0%	4%	0%
Adj. Flow (vph)	43	643	275	313	560	13	265	102	208	75	36	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	918	0	313	573	0	265	310	0	75	74	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	62.0	62.0		19.0	81.0		14.1	39.0		24.9	24.9	
Total Split (%)	51.7%	51.7%		15.8%	67.5%		11.8%	32.5%		20.8%	20.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effct Green (s)	57.5	57.5		76.5	76.5		34.5	34.5		20.4	20.4	
Actuated g/C Ratio	0.48	0.48		0.64	0.64		0.29	0.29		0.17	0.17	
v/c Ratio	0.10	1.04		1.10	0.48		0.71	0.57		0.40	0.23	
Control Delay (s/veh)	18.1	70.7		115.6	12.9		48.4	30.4		51.8	25.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	18.1	70.7		115.6	12.9		48.4	30.4		51.8	25.4	
LOS	B	E		F	B		D	C		D	C	
Approach Delay (s/veh)		68.3			49.2			38.7			38.7	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	5.4	~229.7		~67.4	65.1		52.1	44.7		15.9	7.3	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2036 Future Background SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	12.3	#306.4		#123.2	90.1		78.4	73.7		31.2	20.8	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	413	886		285	1198		373	548		186	327	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	1.04		1.10	0.48		0.71	0.57		0.40	0.23	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay (s/veh): 53.4

Intersection LOS: D

Intersection Capacity Utilization 98.4%

ICU Level of Service F

Analysis Period (min) 15

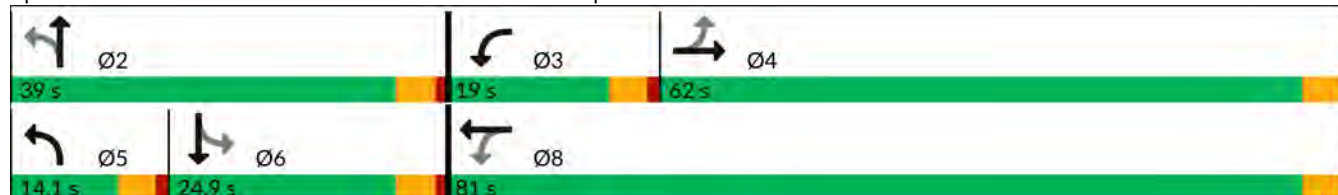
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	866	7	0	810	8	4	0	0	24	0	2
Future Volume (vph)	3	866	7	0	810	8	4	0	0	24	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.999			0.999						0.990	
Flt Protected								0.950			0.956	
Satd. Flow (prot)	0	1900	0	0	1900	0	0	1825	0	0	1818	0
Flt Permitted								0.950			0.956	
Satd. Flow (perm)	0	1900	0	0	1900	0	0	1825	0	0	1818	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	3	921	7	0	862	9	4	0	0	26	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	931	0	0	871	0	0	4	0	0	28	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 58.4%

ICU Level of Service B

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis 2: Existing Site Access/Noble Street & Guelph Street

2036 Future Background SAT
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	866	7	0	810	8	4	0	0	24	0	2
Future Volume (Veh/h)	3	866	7	0	810	8	4	0	0	24	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	921	7	0	862	9	4	0	0	26	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		103										
pX, platoon unblocked				0.52			0.52	0.52	0.52	0.52	0.52	
vC, conflicting volume	871			928			1799	1802	925	1797	1801	867
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	871			393			2079	2084	386	2075	2082	867
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			100			80	100	100	0	100	99
cM capacity (veh/h)	783			602			20	27	342	21	27	355
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	931	871	4	28								
Volume Left	3	0	4	26								
Volume Right	7	9	0	2								
cSH	783	602	20	22								
Volume to Capacity	0.00	0.00	0.20	1.27								
Queue Length 95th (m)	0.1	0.0	4.4	27.6								
Control Delay (s/veh)	0.1	0.0	221.1	539.7								
Lane LOS	A		F	F								
Approach Delay (s/veh)	0.1	0.0	221.1	539.7								
Approach LOS			F	F								
Intersection Summary												
Average Delay			8.8									
Intersection Capacity Utilization			58.4%	ICU Level of Service					B			
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.4	178.2	83.0	100.4	86.9	113.9	55.7	35.4
Average Queue (m)	25.5	173.3	69.2	75.6	47.3	46.6	22.2	12.4
95th Queue (m)	85.5	175.3	94.9	114.2	81.3	88.6	44.7	25.1
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		62	6	22		0		
Queuing Penalty (veh)		0	0	176		0		
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)		58	12	23	2	1		
Queuing Penalty (veh)		23	61	66	7	3		

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	50.2	165.9	11.9	39.3
Average Queue (m)	2.4	76.1	3.1	13.9
95th Queue (m)	21.9	210.1	10.8	44.7
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)	0	15		0
Queuing Penalty (veh)	1	0		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 336

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2026 Future Total PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	483	186	245	428	7	140	305	143	5	213	40
Future Volume (vph)	71	483	186	245	428	7	140	305	143	5	213	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.958			0.998			0.952			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1774	0	1807	1862	0	1807	1787	0	1217	1859	0
Flt Permitted	0.499			0.089			0.285			0.322		
Satd. Flow (perm)	913	1774	0	169	1862	0	542	1787	0	412	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			20			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	3%	1%	3%	0%	1%	2%	3%	50%	1%	0%
Adj. Flow (vph)	75	508	196	258	451	7	147	321	151	5	224	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	704	0	258	458	0	147	472	0	5	266	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2		6		

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2026 Future Total PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	61.6	61.6		17.0	78.6		13.4	41.4		28.0	28.0	
Total Split (%)	51.3%	51.3%		14.2%	65.5%		11.2%	34.5%		23.3%	23.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effect Green (s)	47.4	47.4		64.0	64.0		37.2	37.2		24.0	24.0	
Actuated g/C Ratio	0.43	0.43		0.58	0.58		0.34	0.34		0.22	0.22	
v/c Ratio	0.19	0.91		0.93	0.42		0.52	0.77		0.06	0.65	
Control Delay (s/veh)	20.2	45.2		66.0	13.9		36.4	42.8		41.0	48.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	20.2	45.2		66.0	13.9		36.4	42.8		41.0	48.9	
LOS	C	D		E	B		D	D		D	D	
Approach Delay (s/veh)		42.8			32.6			41.3			48.8	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	9.8	135.4		37.3	51.1		23.7	90.6		0.9	53.2	
Queue Length 95th (m)	19.5	190.2		#89.3	72.0		42.9	#153.3		4.7	#87.9	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	476	936		285	1262		285	616		89	410	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.16	0.75		0.91	0.36		0.52	0.77		0.06	0.65	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 110.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay (s/veh): 40.0

Intersection LOS: D

Intersection Capacity Utilization 94.2%

ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	622	6	9	627	9	2	0	1	3	0	16
Future Volume (vph)	0	622	6	9	627	9	2	0	1	3	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.999			0.998			0.955			0.885	
Flt Protected					0.999			0.968			0.993	
Satd. Flow (prot)	0	1846	0	0	1861	0	0	1741	0	0	1688	0
Flt Permitted					0.999			0.968			0.993	
Satd. Flow (perm)	0	1846	0	0	1861	0	0	1741	0	0	1688	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	2%	0%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	0	655	6	9	660	9	2	0	1	3	0	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	661	0	0	678	0	0	3	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	50.8%											
Analysis Period (min)	15											
	ICU Level of Service A											

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2026 Future Total PM
08/01/2025

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	622	6	9	627	9	2	0	1	3	0	16	
Future Volume (Veh/h)	0	622	6	9	627	9	2	0	1	3	0	16	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	0	655	6	9	660	9	2	0	1	3	0	17	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None			None									
Median storage (veh)													
Upstream signal (m)	103												
pX, platoon unblocked				0.65				0.65	0.65	0.65	0.65	0.65	
vC, conflicting volume	669			661				1358	1345	658	1342	1344	665
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	669			211				1281	1262	206	1256	1259	665
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			99				98	100	100	97	100	96
cM capacity (veh/h)	921			893				89	109	543	96	110	464
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	661	678	3	20									
Volume Left	0	9	2	3									
Volume Right	6	9	1	17									
cSH	921	893	123	295									
Volume to Capacity	0.00	0.01	0.02	0.07									
Queue Length 95th (m)	0.0	0.2	0.6	1.6									
Control Delay (s/veh)	0.0	0.3	35.0	18.1									
Lane LOS		A	E	C									
Approach Delay (s/veh)	0.0	0.3	35.0	18.1									
Approach LOS			E	C									
Intersection Summary													
Average Delay			0.5										
Intersection Capacity Utilization			50.8%		ICU Level of Service				A				
Analysis Period (min)			15										

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	180.9	81.9	90.8	87.5	162.0	20.6	95.9
Average Queue (m)	28.4	122.6	52.7	57.0	37.4	83.9	3.0	52.6
95th Queue (m)	83.4	190.4	87.3	98.9	83.9	145.9	12.5	86.4
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		8	2	10		3		1
Queuing Penalty (veh)		0	0	64		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	25	5	11	0	13		2
Queuing Penalty (veh)	0	17	20	27	0	19		0

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	101.4	6.3	14.7
Average Queue (m)	31.9	0.5	5.3
95th Queue (m)	130.0	3.6	16.0
Link Distance (m)	179.0	108.6	88.2
Upstream Blk Time (%)	6		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 148

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2026 Future Total SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	489	208	240	424	10	200	77	167	57	27	29
Future Volume (vph)	33	489	208	240	424	10	200	77	167	57	27	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.955			0.997			0.897			0.921	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1822	0	1825	1879	0	1807	1689	0	1825	1736	0
Flt Permitted	0.353			0.222			0.717			0.589		
Satd. Flow (perm)	678	1822	0	426	1879	0	1364	1689	0	1132	1736	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			3			182			32	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	2%	2%	0%	4%	0%
Adj. Flow (vph)	36	532	226	261	461	11	217	84	182	62	29	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	758	0	261	472	0	217	266	0	62	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effect Green (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
v/c Ratio	0.13	0.99		1.54	0.63		0.40	0.34		0.14	0.09	
Control Delay (s/veh)	10.2	48.3		289.5	15.3		12.4	4.9		9.6	5.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	10.2	48.3		289.5	15.3		12.4	4.9		9.6	5.7	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2026 Future Total SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	D		F	B		B	A		A	A	
Approach Delay (s/veh)		46.6			112.9			8.3			7.7	
Approach LOS		D			F			A			A	
Queue Length 50th (m)	1.7	52.0		~30.5	27.8		11.5	3.9		2.9	1.3	
Queue Length 95th (m)	5.9	#114.5		#52.7	50.8		24.3	14.5		8.3	6.0	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	271	763		170	753		545	784		452	713	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.99		1.54	0.63		0.40	0.34		0.14	0.09	

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

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

Natural Cycle: 80

Control Type: Pretimed

Maximum v/c Ratio: 1.54

Intersection Signal Delay (s/veh): 58.5

Intersection LOS: E

Intersection Capacity Utilization 85.2%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	710	18	12	665	7	8	0	2	20	0	2
Future Volume (vph)	3	710	18	12	665	7	8	0	2	20	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.997			0.999			0.975			0.988	
Flt Protected					0.999			0.961			0.956	
Satd. Flow (prot)	0	1897	0	0	1898	0	0	1794	0	0	1815	0
Flt Permitted					0.999			0.961			0.956	
Satd. Flow (perm)	0	1897	0	0	1898	0	0	1794	0	0	1815	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	3	755	19	13	707	7	9	0	2	21	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	777	0	0	727	0	0	11	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	54.0%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2026 Future Total SAT
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	710	18	12	665	7	8	0	2	20	0	2
Future Volume (Veh/h)	3	710	18	12	665	7	8	0	2	20	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	755	19	13	707	7	9	0	2	21	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage veh												
Upstream signal (m)	103											
pX, platoon unblocked				0.66			0.66	0.66	0.66	0.66	0.66	
vC, conflicting volume	714			774			1509	1511	765	1509	1517	711
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	714			406			1514	1516	392	1514	1525	711
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			98			86	100	100	67	100	100
cM capacity (veh/h)	895			765			65	78	436	65	77	437
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	777	727	11	23								
Volume Left	3	13	9	21								
Volume Right	19	7	2	2								
cSH	895	765	76	70								
Volume to Capacity	0.00	0.02	0.14	0.33								
Queue Length 95th (m)	0.1	0.4	3.6	9.3								
Control Delay (s/veh)	0.1	0.5	59.9	80.2								
Lane LOS	A	A	F	F								
Approach Delay (s/veh)	0.1	0.5	59.9	80.2								
Approach LOS			F	F								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			54.0%		ICU Level of Service				A			
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.4	162.3	83.1	100.7	45.0	39.5	21.2	17.4
Average Queue (m)	16.6	90.1	78.5	93.8	20.8	18.8	8.7	5.9
95th Queue (m)	64.9	159.5	89.1	102.9	35.4	32.5	17.5	14.6
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		7	28	79				
Queuing Penalty (veh)		0	0	531				
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)		18	50	80				
Queuing Penalty (veh)		6	218	192				

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	62.5	190.6	51.8	66.5
Average Queue (m)	4.8	183.4	23.2	31.4
95th Queue (m)	32.9	187.9	47.6	81.8
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)	0	97		11
Queuing Penalty (veh)	2	0		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 949

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2031 Future Total PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	533	205	271	472	7	155	337	158	5	235	44
Future Volume (vph)	78	533	205	271	472	7	155	337	158	5	235	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.958			0.998			0.952			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1774	0	1807	1862	0	1807	1787	0	1217	1859	0
Flt Permitted	0.478			0.070			0.210			0.187		
Satd. Flow (perm)	875	1774	0	133	1862	0	399	1787	0	239	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			20			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	3%	1%	3%	0%	1%	2%	3%	50%	1%	0%
Adj. Flow (vph)	82	561	216	285	497	7	163	355	166	5	247	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	777	0	285	504	0	163	521	0	5	293	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2		6		

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2031 Future Total PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	61.6	61.6		17.0	78.6		13.4	41.4		28.0	28.0	
Total Split (%)	51.3%	51.3%		14.2%	65.5%		11.2%	34.5%		23.3%	23.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effect Green (s)	52.9	52.9		69.9	69.9		37.0	37.0		23.6	23.6	
Actuated g/C Ratio	0.46	0.46		0.60	0.60		0.32	0.32		0.20	0.20	
v/c Ratio	0.21	0.95		1.09	0.45		0.69	0.89		0.10	0.77	
Control Delay (s/veh)	20.1	50.7		114.6	13.9		48.1	56.3		45.8	57.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	20.1	50.7		114.6	13.9		48.1	56.3		45.8	57.8	
LOS	C	D		F	B		D	E		D	E	
Approach Delay (s/veh)		47.8			50.2			54.3			57.6	
Approach LOS		D			D			D			E	
Queue Length 50th (m)	10.9	161.0		~59.8	58.2		29.2	114.7		1.0	64.8	
Queue Length 95th (m)	21.4	#241.3		#113.6	81.1		#53.5	#179.7		4.9	#105.3	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	432	887		261	1193		236	584		48	383	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.88		1.09	0.42		0.69	0.89		0.10	0.77	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 116

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay (s/veh): 51.3

Intersection LOS: D

Intersection Capacity Utilization 102.1%

ICU Level of Service G

Analysis Period (min) 15

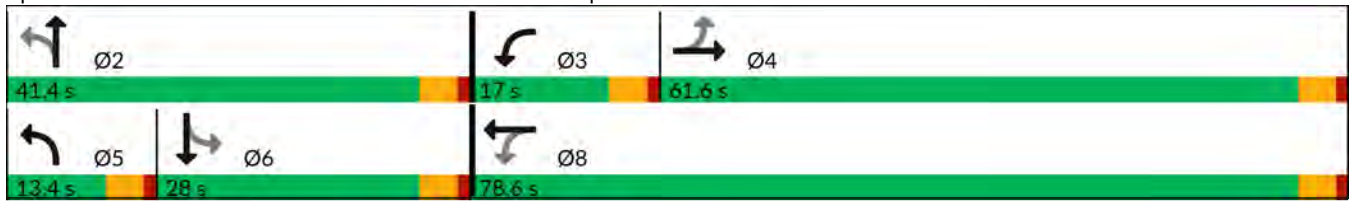
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	686	6	9	692	10	2	0	1	3	0	17
Future Volume (vph)	0	686	6	9	692	10	2	0	1	3	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.999			0.998			0.955			0.884	
Flt Protected					0.999			0.968			0.993	
Satd. Flow (prot)	0	1846	0	0	1861	0	0	1741	0	0	1686	0
Flt Permitted					0.999			0.968			0.993	
Satd. Flow (perm)	0	1846	0	0	1861	0	0	1741	0	0	1686	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	2%	0%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	0	722	6	9	728	11	2	0	1	3	0	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	728	0	0	748	0	0	3	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	54.2%											
Analysis Period (min)	15											
	ICU Level of Service A											

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2031 Future Total PM
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	686	6	9	692	10	2	0	1	3	0	17
Future Volume (Veh/h)	0	686	6	9	692	10	2	0	1	3	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	722	6	9	728	11	2	0	1	3	0	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage veh												
Upstream signal (m)	103											
pX, platoon unblocked				0.60			0.60	0.60	0.60	0.60	0.60	
vC, conflicting volume	739			728			1495	1482	725	1478	1480	734
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	739			213			1491	1470	208	1462	1466	734
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			99			97	100	100	95	100	96
cM capacity (veh/h)	867			821			58	75	499	64	76	424
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	728	748	3	21								
Volume Left	0	9	2	3								
Volume Right	6	11	1	18								
cSH	867	821	82	235								
Volume to Capacity	0.00	0.01	0.04	0.09								
Queue Length 95th (m)	0.0	0.3	0.9	2.2								
Control Delay (s/veh)	0.0	0.3	50.4	21.8								
Lane LOS		A	F	C								
Approach Delay (s/veh)	0.0	0.3	50.4	21.8								
Approach LOS			F	C								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			54.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	182.9	83.1	99.8	87.6	177.3	33.6	107.4
Average Queue (m)	39.3	171.8	73.5	82.5	68.9	160.9	5.2	60.9
95th Queue (m)	103.6	195.6	95.9	118.7	115.9	201.7	23.5	101.0
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		53	13	38		61		4
Queuing Penalty (veh)		0	0	271		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	53	23	40	1	63		8
Queuing Penalty (veh)	0	42	112	108	7	97		0

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	1.0	193.2	7.6	43.9
Average Queue (m)	0.0	126.0	0.9	17.5
95th Queue (m)	0.7	257.0	5.1	51.7
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)		41		1
Queuing Penalty (veh)		0		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 638

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2031 Future Total SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	540	229	265	468	11	221	85	183	62	30	32
Future Volume (vph)	37	540	229	265	468	11	221	85	183	62	30	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.955			0.997			0.897			0.923	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1822	0	1825	1879	0	1807	1689	0	1825	1739	0
Flt Permitted	0.301			0.222			0.713			0.559		
Satd. Flow (perm)	578	1822	0	426	1879	0	1356	1689	0	1074	1739	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			3			158			35	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	2%	2%	0%	4%	0%
Adj. Flow (vph)	40	587	249	288	509	12	240	92	199	67	33	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	836	0	288	521	0	240	291	0	67	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effect Green (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
v/c Ratio	0.17	1.10		1.69	0.69		0.44	0.38		0.16	0.09	
Control Delay (s/veh)	11.1	79.9		356.9	17.4		13.1	6.2		9.9	5.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	11.1	79.9		356.9	17.4		13.1	6.2		9.9	5.7	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2031 Future Total SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	E		F	B		B	A		A	A	
Approach Delay (s/veh)		76.8			138.3			9.3			7.8	
Approach LOS		E			F			A			A	
Queue Length 50th (m)	1.9	~76.1		~35.2	31.8		12.9	6.4		3.2	1.5	
Queue Length 95th (m)	6.7	#130.5		#59.1	#60.7		27.2	18.2		8.9	6.5	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	231	763		170	753		542	770		429	716	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.17	1.10		1.69	0.69		0.44	0.38		0.16	0.09	

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

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

Natural Cycle: 90

Control Type: Pretimed

Maximum v/c Ratio: 1.69

Intersection Signal Delay (s/veh): 78.8

Intersection LOS: E

Intersection Capacity Utilization 91.9%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	784	18	12	734	7	8	0	2	22	0	2
Future Volume (vph)	3	784	18	12	734	7	8	0	2	22	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.997			0.999			0.975			0.989	
Flt Protected					0.999			0.961			0.956	
Satd. Flow (prot)	0	1897	0	0	1898	0	0	1794	0	0	1816	0
Flt Permitted					0.999			0.961			0.956	
Satd. Flow (perm)	0	1897	0	0	1898	0	0	1794	0	0	1816	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	3	834	19	13	781	7	9	0	2	23	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	856	0	0	801	0	0	11	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	57.7%											
Analysis Period (min)	15											
	ICU Level of Service B											

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2031 Future Total SAT
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	784	18	12	734	7	8	0	2	22	0	2
Future Volume (Veh/h)	3	784	18	12	734	7	8	0	2	22	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	834	19	13	781	7	9	0	2	23	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage veh												
Upstream signal (m)	103											
pX, platoon unblocked				0.64			0.64	0.64	0.64	0.64	0.64	
vC, conflicting volume	788			853			1662	1664	844	1662	1670	785
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	788			495			1752	1754	480	1752	1763	785
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			98			79	100	99	46	100	99
cM capacity (veh/h)	840			688			43	54	377	43	53	396
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	856	801	11	25								
Volume Left	3	13	9	23								
Volume Right	19	7	2	2								
cSH	840	688	51	46								
Volume to Capacity	0.00	0.02	0.22	0.55								
Queue Length 95th (m)	0.1	0.4	5.5	15.4								
Control Delay (s/veh)	0.1	0.5	94.5	153.6								
Lane LOS	A	A	F	F								
Approach Delay (s/veh)	0.1	0.5	94.5	153.6								
Approach LOS			F	F								
Intersection Summary												
Average Delay	3.2											
Intersection Capacity Utilization	57.7%				ICU Level of Service				B			
Analysis Period (min)	15											

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.6	180.4	83.0	102.0	46.5	44.0	25.1	20.5
Average Queue (m)	48.2	167.5	75.7	90.1	23.2	21.3	10.4	6.3
95th Queue (m)	121.0	204.1	92.1	110.1	38.5	36.7	21.0	15.7
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		79	33	86				
Queuing Penalty (veh)		0	0	640				
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	70	47	87				
Queuing Penalty (veh)	0	26	224	231				

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	83.3	191.4	68.3	76.8
Average Queue (m)	7.3	182.6	33.7	34.6
95th Queue (m)	45.5	187.8	72.9	84.1
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)	1	99		9
Queuing Penalty (veh)	8	0		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1129

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2036 Future Total PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	588	227	298	521	8	171	372	173	5	259	49
Future Volume (vph)	86	588	227	298	521	8	171	372	173	5	259	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.958			0.998			0.952			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1774	0	1807	1862	0	1807	1787	0	1217	1859	0
Flt Permitted	0.456			0.065			0.143			0.170		
Satd. Flow (perm)	834	1774	0	124	1862	0	272	1787	0	218	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			20			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	3%	1%	3%	0%	1%	2%	3%	50%	1%	0%
Adj. Flow (vph)	91	619	239	314	548	8	180	392	182	5	273	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	858	0	314	556	0	180	574	0	5	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2		6		

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2036 Future Total PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	61.6	61.6		17.0	78.6		13.4	41.4		28.0	28.0	
Total Split (%)	51.3%	51.3%		14.2%	65.5%		11.2%	34.5%		23.3%	23.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Act Effect Green (s)	57.1	57.1		74.1	74.1		36.9	36.9		23.5	23.5	
Actuated g/C Ratio	0.48	0.48		0.62	0.62		0.31	0.31		0.20	0.20	
v/c Ratio	0.23	1.00		1.25	0.48		0.91	1.02		0.12	0.88	
Control Delay (s/veh)	20.5	62.9		172.1	14.3		80.3	83.0		47.6	71.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	20.5	62.9		172.1	14.3		80.3	83.0		47.6	71.2	
LOS	C	E		F	B		F	F		D	E	
Approach Delay (s/veh)		58.8			71.2			82.4			70.8	
Approach LOS		E			E			F			E	
Queue Length 50th (m)	12.3	~195.2		~76.5	66.8		32.6	~139.8		1.0	73.5	
Queue Length 95th (m)	23.6	#283.6		#132.9	92.5		#68.2	#208.1		4.9	#123.2	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	396	855		251	1150		197	563		42	369	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.23	1.00		1.25	0.48		0.91	1.02		0.12	0.88	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay (s/veh): 70.0

Intersection LOS: E

Intersection Capacity Utilization 110.6%

ICU Level of Service H

Analysis Period (min) 15

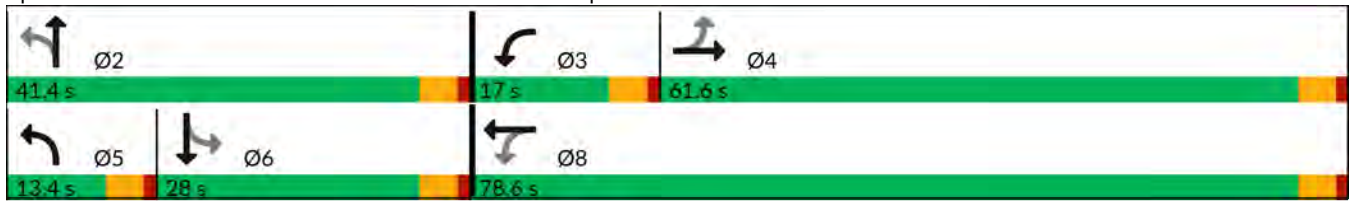
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



Lanes, Volumes, Timings
2: Existing Site Access/Noble Street & Guelph Street

2036 Future Total PM
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	758	6	9	764	10	2	0	1	3	0	19
Future Volume (vph)	0	758	6	9	764	10	2	0	1	3	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.999			0.998			0.955			0.883	
Flt Protected					0.999			0.968			0.994	
Satd. Flow (prot)	0	1846	0	0	1861	0	0	1741	0	0	1686	0
Flt Permitted					0.999			0.968			0.994	
Satd. Flow (perm)	0	1846	0	0	1861	0	0	1741	0	0	1686	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	2%	0%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	0	798	6	9	804	11	2	0	1	3	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	804	0	0	824	0	0	3	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	58.0%				ICU Level of Service B							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2: Existing Site Access/Noble Street & Guelph Street

2036 Future Total PM
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	758	6	9	764	10	2	0	1	3	0	19
Future Volume (Veh/h)	0	758	6	9	764	10	2	0	1	3	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	798	6	9	804	11	2	0	1	3	0	20
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)		103										
pX, platoon unblocked				0.55			0.55	0.55	0.55	0.55	0.55	
vC, conflicting volume	815			804			1649	1634	801	1630	1632	810
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	815			235			1770	1744	230	1735	1739	810
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			99			94	100	100	92	100	95
cM capacity (veh/h)	812			740			34	47	445	38	47	383
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	804	824	3	23								
Volume Left	0	9	2	3								
Volume Right	6	11	1	20								
cSH	812	740	49	175								
Volume to Capacity	0.00	0.01	0.06	0.13								
Queue Length 95th (m)	0.0	0.3	1.5	3.4								
Control Delay (s/veh)	0.0	0.3	84.1	28.7								
Lane LOS		A	F	D								
Approach Delay (s/veh)	0.0	0.3	84.1	28.7								
Approach LOS			F	D								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			58.0%	ICU Level of Service					B			
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	185.0	83.0	101.7	87.6	178.1	63.5	110.8
Average Queue (m)	45.3	175.5	80.3	95.7	70.3	168.2	8.1	81.9
95th Queue (m)	109.3	181.5	88.8	102.9	114.6	175.8	34.9	128.2
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		61	18	54		71		28
Queuing Penalty (veh)		0	0	423		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	57	30	56	8	65	0	38
Queuing Penalty (veh)	0	49	158	166	46	111	0	2

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.3	194.8	6.6	69.4
Average Queue (m)	0.9	182.6	0.9	37.2
95th Queue (m)	10.1	206.6	4.4	70.9
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)		68		2
Queuing Penalty (veh)		0		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 955

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2036 Future Total SAT
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	595	253	292	516	12	244	94	201	69	33	35
Future Volume (vph)	40	595	253	292	516	12	244	94	201	69	33	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.955			0.997			0.898			0.923	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1822	0	1825	1879	0	1807	1691	0	1825	1739	0
Flt Permitted	0.246			0.222			0.709			0.524		
Satd. Flow (perm)	473	1822	0	426	1879	0	1349	1691	0	1007	1739	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			3			129			38	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	2%	2%	0%	4%	0%
Adj. Flow (vph)	43	647	275	317	561	13	265	102	218	75	36	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	922	0	317	574	0	265	320	0	75	74	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effect Green (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
v/c Ratio	0.23	1.21		1.86	0.76		0.49	0.42		0.19	0.10	
Control Delay (s/veh)	12.8	124.4		430.3	20.8		14.0	7.8		10.3	5.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	12.8	124.4		430.3	20.8		14.0	7.8		10.3	5.7	

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2036 Future Total SAT
08/01/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	F		F	C		B	A		B	A	
Approach Delay (s/veh)		119.4			166.5			10.6			8.0	
Approach LOS		F			F			B			A	
Queue Length 50th (m)	2.1	~91.8		~40.2	36.5		14.7	9.5		3.6	1.6	
Queue Length 95th (m)	7.5	#148.1		#65.8	#79.8		30.5	23.2		9.9	6.9	
Internal Link Dist (m)		155.4			79.0			149.5			89.8	
Turn Bay Length (m)	85.0			80.0			80.0			80.0		
Base Capacity (vph)	189	763		170	753		539	753		402	718	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.23	1.21		1.86	0.76		0.49	0.42		0.19	0.10	

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

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

Natural Cycle: 100

Control Type: Pretimed

Maximum v/c Ratio: 1.86

Intersection Signal Delay (s/veh): 104.6

Intersection LOS: F

Intersection Capacity Utilization 99.4%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	866	19	12	810	8	8	0	2	24	0	2
Future Volume (vph)	3	866	19	12	810	8	8	0	2	24	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.997			0.999			0.975			0.990	
Flt Protected					0.999			0.961			0.956	
Satd. Flow (prot)	0	1897	0	0	1898	0	0	1794	0	0	1818	0
Flt Permitted					0.999			0.961			0.956	
Satd. Flow (perm)	0	1897	0	0	1898	0	0	1794	0	0	1818	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	3	921	20	13	862	9	9	0	2	26	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	944	0	0	884	0	0	11	0	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	61.9%											
Analysis Period (min)	15											
	ICU Level of Service B											

HCM Unsignalized Intersection Capacity Analysis

2: Existing Site Access/Noble Street & Guelph Street

2036 Future Total SAT
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	866	19	12	810	8	8	0	2	24	0	2
Future Volume (Veh/h)	3	866	19	12	810	8	8	0	2	24	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	921	20	13	862	9	9	0	2	26	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage veh												
Upstream signal (m)	103											
pX, platoon unblocked				0.63			0.63	0.63	0.63	0.63	0.63	
vC, conflicting volume	871			941			1832	1834	931	1832	1840	867
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	871			609			2028	2032	594	2028	2041	867
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			98			66	100	99	2	100	99
cM capacity (veh/h)	783			608			26	35	317	26	35	355
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	944	884	11	28								
Volume Left	3	13	9	26								
Volume Right	20	9	2	2								
cSH	783	608	32	28								
Volume to Capacity	0.00	0.02	0.35	0.99								
Queue Length 95th (m)	0.1	0.5	8.5	24.5								
Control Delay (s/veh)	0.1	0.6	169.9	368.4								
Lane LOS	A	A	F	F								
Approach Delay (s/veh)	0.1	0.6	169.9	368.4								
Approach LOS			F	F								
Intersection Summary												
Average Delay	6.9											
Intersection Capacity Utilization	61.9%				ICU Level of Service				B			
Analysis Period (min)	15											

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	180.6	83.0	100.5	55.6	51.9	27.6	20.5
Average Queue (m)	53.9	173.8	77.3	91.8	24.9	24.4	12.2	7.3
95th Queue (m)	126.5	177.2	92.0	101.0	42.6	41.7	22.7	16.4
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		91	41	88				
Queuing Penalty (veh)		0	0	724				
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)		74	61	89				
Queuing Penalty (veh)		30	322	261				

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	51.6	191.0	71.9	77.6
Average Queue (m)	1.8	182.8	40.0	28.3
95th Queue (m)	21.1	187.6	84.0	73.7
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)	0	98	2	9
Queuing Penalty (veh)	3	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1340

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	588	227	298	521	8	171	372	173	5	259	49
Future Volume (vph)	86	588	227	298	521	8	171	372	173	5	259	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.958			0.998			0.952			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1774	0	1807	1862	0	1807	1787	0	1217	1859	0
Flt Permitted	0.456			0.068			0.154			0.186		
Satd. Flow (perm)	834	1774	0	129	1862	0	293	1787	0	238	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			1			20			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	3%	1%	3%	0%	1%	2%	3%	50%	1%	0%
Adj. Flow (vph)	91	619	239	314	548	8	180	392	182	5	273	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	858	0	314	556	0	180	574	0	5	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	59.0	59.0		20.8	79.8		14.2	40.2		26.0	26.0	
Total Split (%)	49.2%	49.2%		17.3%	66.5%		11.8%	33.5%		21.7%	21.7%	
Maximum Green (s)	54.5	54.5		16.3	75.3		9.7	35.7		21.5	21.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0			7.0		7.0	7.0	
Flash Don't Walk (s)	11.0	11.0			11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0			0		0	0	
Act Effect Green (s)	54.5	54.5		75.3	75.3		35.7	35.7		21.5	21.5	
Actuated g/C Ratio	0.45	0.45		0.63	0.63		0.30	0.30		0.18	0.18	
v/c Ratio	0.24	1.05		1.02	0.48		0.86	1.05		0.12	0.96	
Control Delay (s/veh)	22.3	77.5		91.4	13.5		70.0	93.1		49.0	88.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	22.3	77.5		91.4	13.5		70.0	93.1		49.0	88.4	
LOS	C	E		F	B		E	F		D	F	
Approach Delay (s/veh)		72.2			41.6			87.6			87.8	
Approach LOS		E			D			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay (s/veh): 68.8

Intersection LOS: E

Intersection Capacity Utilization 110.6%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	758	6	9	764	10	2	0	1	3	0	19
Future Volume (vph)	0	758	6	9	764	10	2	0	1	3	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.999			0.998			0.955			0.883	
Flt Protected					0.999			0.968			0.994	
Satd. Flow (prot)	0	1846	0	0	1861	0	0	1741	0	0	1686	0
Flt Permitted					0.999			0.968			0.994	
Satd. Flow (perm)	0	1846	0	0	1861	0	0	1741	0	0	1686	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	4%	2%	0%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	0	798	6	9	804	11	2	0	1	3	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	804	0	0	824	0	0	3	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	58.0%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2: Existing Site Access/Noble Street & Guelph Street

2036 Future Total PM Optimized
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	758	6	9	764	10	2	0	1	3	0	19
Future Volume (Veh/h)	0	758	6	9	764	10	2	0	1	3	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	798	6	9	804	11	2	0	1	3	0	20
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)		103										
pX, platoon unblocked				0.57			0.57	0.57	0.57	0.57	0.57	
vC, conflicting volume	815			804			1649	1634	801	1630	1632	810
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	815			274			1762	1736	269	1728	1732	810
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			99			94	100	100	92	100	95
cM capacity (veh/h)	812			738			35	49	437	39	49	383
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	804	824	3	23								
Volume Left	0	9	2	3								
Volume Right	6	11	1	20								
cSH	812	738	51	179								
Volume to Capacity	0.00	0.01	0.06	0.13								
Queue Length 95th (m)	0.0	0.3	1.4	3.3								
Control Delay (s/veh)	0.0	0.3	80.6	28.0								
Lane LOS		A	F	D								
Approach Delay (s/veh)	0.0	0.3	80.6	28.0								
Approach LOS			F	D								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			58.0%	ICU Level of Service						B		
Analysis Period (min)			15									

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	184.7	83.0	97.8	87.6	179.2	77.6	114.6
Average Queue (m)	49.4	175.2	70.9	78.4	72.1	168.7	12.4	94.6
95th Queue (m)	115.8	181.2	97.2	119.5	115.9	173.6	48.3	133.8
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		63	13	28		71		51
Queuing Penalty (veh)		0	0	217		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	59	20	29	2	69	0	59
Queuing Penalty (veh)	0	51	104	87	11	118	0	3

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	166.3	7.4	40.0
Average Queue (m)	97.8	0.7	16.5
95th Queue (m)	231.7	4.1	49.3
Link Distance (m)	179.0	108.6	88.2
Upstream Blk Time (%)	23		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 590

Lanes, Volumes, Timings
1: Winston Churchill Boulevard & Guelph Street

2036 Future Total SAT Optimized
08/01/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	595	253	292	516	12	244	94	201	69	33	35
Future Volume (vph)	40	595	253	292	516	12	244	94	201	69	33	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		0.0	80.0		0.0	80.0		0.0	80.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Frt		0.955			0.997			0.898			0.923	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1822	0	1825	1879	0	1807	1691	0	1825	1739	0
Flt Permitted	0.448			0.062			0.567			0.505		
Satd. Flow (perm)	861	1822	0	119	1879	0	1078	1691	0	970	1739	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			2			86			37	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.4			103.0			173.5			113.8	
Travel Time (s)		12.9			7.4			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	1%	2%	2%	0%	4%	0%
Adj. Flow (vph)	43	647	275	317	561	13	265	102	218	75	36	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	922	0	317	574	0	265	320	0	75	74	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		9.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	64.0	64.0		21.0	85.0		12.9	35.0		22.1	22.1	
Total Split (%)	53.3%	53.3%		17.5%	70.8%		10.8%	29.2%		18.4%	18.4%	
Maximum Green (s)	59.5	59.5		16.5	80.5		8.4	30.5		17.6	17.6	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0			7.0		7.0	7.0	
Flash Don't Walk (s)	11.0	11.0			11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0			0		0	0	
Act Effect Green (s)	59.5	59.5		80.5	80.5		30.9	30.9		18.0	18.0	
Actuated g/C Ratio	0.49	0.49		0.67	0.67		0.26	0.26		0.15	0.15	
v/c Ratio	0.10	1.01		1.01	0.46		0.81	0.64		0.52	0.25	
Control Delay (s/veh)	17.2	62.4		90.1	10.9		60.5	35.5		61.1	27.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	17.2	62.4		90.1	10.9		60.5	35.5		61.1	27.6	
LOS	B	E		F	B		E	D		E	C	
Approach Delay (s/veh)		60.4			39.1			46.9			44.5	
Approach LOS		E			D			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120.4

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay (s/veh): 49.1

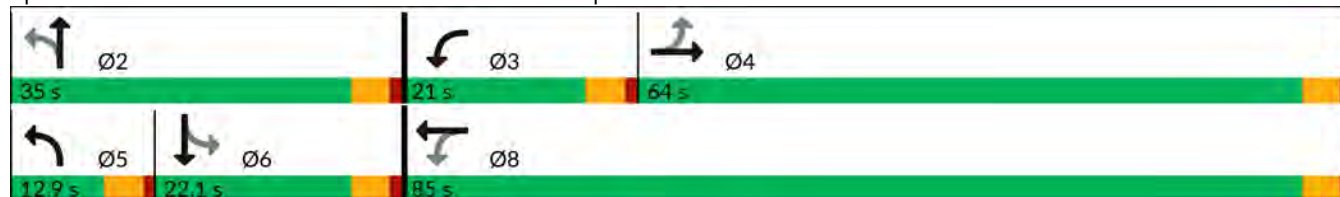
Intersection LOS: D

Intersection Capacity Utilization 99.4%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Boulevard & Guelph Street



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	866	19	12	810	8	8	0	2	24	0	2
Future Volume (vph)	3	866	19	12	810	8	8	0	2	24	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. 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
Frt		0.997			0.999			0.975			0.990	
Flt Protected					0.999			0.961			0.956	
Satd. Flow (prot)	0	1897	0	0	1898	0	0	1794	0	0	1818	0
Flt Permitted					0.999			0.961			0.956	
Satd. Flow (perm)	0	1897	0	0	1898	0	0	1794	0	0	1818	0
Link Speed (k/h)		50			50			48			48	
Link Distance (m)		103.0			183.8			116.7			98.6	
Travel Time (s)		7.4			13.2			8.8			7.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	0%	2%	1%	0%	0%	2%	2%	0%	2%	0%
Adj. Flow (vph)	3	921	20	13	862	9	9	0	2	26	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	944	0	0	884	0	0	11	0	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	61.9%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
2: Existing Site Access/Noble Street & Guelph Street

2036 Future Total SAT Optimized
08/01/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	866	19	12	810	8	8	0	2	24	0	2
Future Volume (Veh/h)	3	866	19	12	810	8	8	0	2	24	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	921	20	13	862	9	9	0	2	26	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)	103											
pX, platoon unblocked				0.50			0.50	0.50	0.50	0.50	0.50	
vC, conflicting volume	871			941			1832	1834	931	1832	1840	867
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	871			387			2160	2165	367	2160	2176	867
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			98			47	100	99	0	100	99
cM capacity (veh/h)	783			588			17	23	341	17	23	355
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	944	884	11	28								
Volume Left	3	13	9	26								
Volume Right	20	9	2	2								
cSH	783	588	21	18								
Volume to Capacity	0.00	0.02	0.53	1.53								
Queue Length 95th (m)	0.1	0.5	11.5	29.7								
Control Delay (s/veh)	0.1	0.7	305.4	709.6								
Lane LOS	A	A	F	F								
Approach Delay (s/veh)	0.1	0.7	305.4	709.6								
Approach LOS			F	F								
Intersection Summary												
Average Delay				12.8								
Intersection Capacity Utilization				61.9%	ICU Level of Service				B			
Analysis Period (min)				15								

Intersection: 1: Winston Churchill Boulevard & Guelph Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	92.5	177.2	83.0	99.2	87.4	145.4	69.9	48.6
Average Queue (m)	26.6	172.2	62.2	66.3	62.3	67.0	31.2	14.3
95th Queue (m)	86.9	185.0	91.1	105.8	99.1	133.1	58.7	33.6
Link Distance (m)		168.5		83.2		162.7		102.8
Upstream Blk Time (%)		59	3	13		2		0
Queuing Penalty (veh)		0	0	107		0		0
Storage Bay Dist (m)	85.0		80.0		80.0		80.0	
Storage Blk Time (%)	0	55	6	15	14	3	0	
Queuing Penalty (veh)	0	22	31	43	40	7	0	

Intersection: 2: Existing Site Access/Noble Street & Guelph Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	75.6	176.4	16.1	21.9
Average Queue (m)	3.6	44.7	3.7	7.0
95th Queue (m)	27.8	150.7	12.0	17.0
Link Distance (m)	83.2	179.0	108.6	88.2
Upstream Blk Time (%)	0	3		
Queuing Penalty (veh)	4	0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 253