

Appendix J
Future 2031 Traffic Analysis

HCM Unsignalized Intersection Capacity Analysis
 1: Winston Churchill Boulevard & Olde Base Line Road

2031 Traffic
 AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	37	15	25	191	45
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	37	15	25	191	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	454	28			40	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	454	28			40	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	98	96			88	
cM capacity (veh/h)	498	1025			1576	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	47	40	236
Volume Left	10	0	191
Volume Right	37	25	0
cSH	837	1700	1576
Volume to Capacity	0.06	0.02	0.12
Queue Length 95th (m)	1.2	0.0	2.9
Control Delay (s)	9.6	0.0	6.3
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	6.3
Approach LOS	A		

Intersection Summary			
Average Delay		6.0	
Intersection Capacity Utilization		29.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Winston Churchill Boulevard & Sideroad 5

2031 Traffic
AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	51	7	43	171	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	51	7	43	171	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	228	172	172			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228	172	172			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	94	100			
cM capacity (veh/h)	760	877	1417			
Direction, Lane #						
	EB 1	NB 1	SB 1			
Volume Total	56	50	172			
Volume Left	5	7	0			
Volume Right	51	0	1			
cSH	866	1417	1700			
Volume to Capacity	0.06	0.00	0.10			
Queue Length 95th (m)	1.4	0.1	0.0			
Control Delay (s)	9.4	1.1	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.4	1.1	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			19.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 3: Winston Churchill Boulevard & The Grange Side Road

2031 Traffic
 AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	4	59	5	7	168
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	4	59	5	7	168
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	244	62			64	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	244	62			64	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	746	1009			1551	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	64	175
Volume Left	2	0	7
Volume Right	4	5	0
cSH	903	1700	1551
Volume to Capacity	0.01	0.04	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	9.0	0.0	0.3
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	0.3
Approach LOS	A		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		24.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

4: Winston Churchill Blvd & Bush Street

2031 Traffic
AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↗
Volume (veh/h)	129	157	3	63	61	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	129	157	3	63	61	14
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			288		278	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			288		278	210
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		91	98
cM capacity (veh/h)			1283		694	834

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	286	66	75
Volume Left	0	3	61
Volume Right	157	0	14
cSH	1700	1283	716
Volume to Capacity	0.17	0.00	0.10
Queue Length 95th (m)	0.0	0.0	2.4
Control Delay (s)	0.0	0.4	10.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	10.6
Approach LOS			B

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization	27.4%		ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

5: Olde Base Line Road & Shaws Creek Road

2031 Traffic
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	2	209	60	4	5	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	209	60	4	5	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)						
pX, platoon unblocked						
vC, conflicting volume	64				275	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64				275	62
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1551				718	1009
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	211	64	6			
Volume Left	2	0	5			
Volume Right	0	4	1			
cSH	1551	1700	754			
Volume to Capacity	0.00	0.04	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.1	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			22.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
6: Rockside Road & Olde Base Line Road

2031 Traffic
AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	215	1	1	42	2	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	215	1	1	42	2	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			216		260	216
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			216		260	216
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1366		733	829

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	216	43	7
Volume Left	0	1	2
Volume Right	1	0	5
cSH	1700	1366	799
Volume to Capacity	0.13	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.2	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	9.5
Approach LOS			A

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization	21.4%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

7: Mississauga Road & Olde Base Line Road

2031 Traffic
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	0	59	170	8	29	8	16	45	11	18	224	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	59	170	8	29	8	16	45	11	18	224	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)												
pX, platoon unblocked												
vC, conflicting volume	366	349	225	543	344	50	226			56		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366	349	225	543	344	50	226			56		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	100	89	79	98	95	99	99			99		
cM capacity (veh/h)	556	561	817	324	561	1023	1313			1523		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	229	45	72	244								
Volume Left	0	8	16	18								
Volume Right	170	8	11	2								
cSH	731	535	1313	1523								
Volume to Capacity	0.31	0.08	0.01	0.01								
Queue Length 95th (m)	9.4	1.9	0.3	0.3								
Control Delay (s)	12.2	12.3	1.8	0.6								
Lane LOS	B	B	A	A								
Approach Delay (s)	12.2	12.3	1.8	0.6								
Approach LOS	B	B										
Intersection Summary												
Average Delay			6.1									
Intersection Capacity Utilization			34.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: Mississauga Road & The Grange Side Road

2031 Traffic
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	0	1	16	11	7	1	1	41	6	5	206	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1	16	11	7	1	1	41	6	5	206	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	266	265	206	278	262	44	206			47		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266	265	206	278	262	44	206			47		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	98	99	100	100			100		
cM capacity (veh/h)	682	641	820	662	644	1032	1377			1573		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	17	19	48	211
Volume Left	0	11	1	5
Volume Right	16	1	6	0
cSH	806	668	1377	1573
Volume to Capacity	0.02	0.03	0.00	0.00
Queue Length 95th (m)	0.5	0.6	0.0	0.1
Control Delay (s)	9.6	10.6	0.2	0.2
Lane LOS	A	B	A	A
Approach Delay (s)	9.6	10.6	0.2	0.2
Approach LOS	A	B		

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization	27.7%		ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
 14: Mississauga Road & Woodland Court

2031 Traffic
 AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	1	28	1	0	216
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	1	28	1	0	216
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	244	28			29	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	244	28			29	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	748	1052			1597	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	13	29	216
Volume Left	12	0	0
Volume Right	1	1	0
cSH	765	1700	1597
Volume to Capacity	0.02	0.02	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	9.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.8	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		21.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 15: Mississauga Road & Caletton Mountain Dr

2031 Traffic
 AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	2	53	2	1	217
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	2	53	2	1	217
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	273	54			55	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	273	54			55	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	720	1019			1563	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	3	55	218
Volume Left	1	0	1
Volume Right	2	2	0
cSH	895	1700	1563
Volume to Capacity	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	9.0	0.0	0.0
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		22.2%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
 16: Mississauga Road & Bush Street/Coffee Shop Access

2031 Traffic
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	8	1	152	6	2	5	32	6	4	5	59	6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	1	152	6	2	5	32	6	4	5	59	6

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	161	13	42	70
Volume Left (vph)	8	6	32	5
Volume Right (vph)	152	5	4	6
Hadj (s)	-0.53	-0.14	0.23	-0.04
Departure Headway (s)	3.6	4.2	4.5	4.2
Degree Utilization, x	0.16	0.02	0.05	0.08
Capacity (veh/h)	958	829	752	810
Control Delay (s)	7.3	7.2	7.8	7.6
Approach Delay (s)	7.3	7.2	7.8	7.6
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.5	
Level of Service		A	
Intersection Capacity Utilization	25.6%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 99: Wellington Rd 52/Bush St & Winston Churchill Blvd

2031 Traffic
 AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

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

HCM Unsignalized Intersection Capacity Analysis
 100: Shaws Creek Road & Bush Street

2031 Traffic
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	0	0	0
Volume Left (vph)	0	0	0	0
Volume Right (vph)	0	0	0	0
Hadj (s)	0.00	0.00	0.00	0.00
Departure Headway (s)	3.9	3.9	3.9	3.9
Degree Utilization, x	0.00	0.00	0.00	0.00
Capacity (veh/h)	917	917	917	917
Control Delay (s)	6.9	6.9	6.9	6.9
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS	A	A	A	A

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

HCM Unsignalized Intersection Capacity Analysis
 1: Winston Churchill Boulevard & Olde Base Line Road

2031 Traffic
 PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	24	176	51	18	75	25
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	24	176	51	18	75	25
Pedestrians	1		1			
Lane Width (m)	3.7		3.7			
Walking Speed (m/s)	1.2		1.2			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	237	61			70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	237	61			70	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	82			95	
cM capacity (veh/h)	718	1003			1542	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	200	69	100
Volume Left	24	0	75
Volume Right	176	18	0
cSH	958	1700	1542
Volume to Capacity	0.21	0.04	0.05
Queue Length 95th (m)	5.5	0.0	1.1
Control Delay (s)	9.7	0.0	5.7
Lane LOS	A		A
Approach Delay (s)	9.7	0.0	5.7
Approach LOS	A		

Intersection Summary			
Average Delay		6.8	
Intersection Capacity Utilization		31.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Winston Churchill Boulevard & Sideroad 5

2031 Traffic
PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	25	60	149	63	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	25	60	149	63	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	335	66	69			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	335	66	69			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	96			
cM capacity (veh/h)	639	989	1545			
Direction, Lane #						
	EB 1	NB 1	SB 1			
Volume Total	30	209	69			
Volume Left	5	60	0			
Volume Right	25	0	6			
cSH	906	1545	1700			
Volume to Capacity	0.03	0.04	0.04			
Queue Length 95th (m)	0.7	0.8	0.0			
Control Delay (s)	9.1	2.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	2.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization		27.8%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Winston Churchill Boulevard & The Grange Side Road

2031 Traffic
PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	6	16	163	5	7	62
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	16	163	5	7	62
Pedestrians	1					1
Lane Width (m)	3.7					3.7
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	242	168			169	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	242	168			169	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			100	
cM capacity (veh/h)	746	880			1420	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	168	69
Volume Left	6	0	7
Volume Right	16	5	0
cSH	839	1700	1420
Volume to Capacity	0.03	0.10	0.00
Queue Length 95th (m)	0.6	0.0	0.1
Control Delay (s)	9.4	0.0	0.8
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	0.8
Approach LOS	A		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		19.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

4: Winston Churchill Blvd & Bush Street

2031 Traffic
PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	65	65	3	159	167	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	65	65	3	159	167	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			130		262	98
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			130		262	98
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		77	99
cM capacity (veh/h)			1468		727	964
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	130	162	174			
Volume Left	0	3	167			
Volume Right	65	0	7			
cSH	1700	1468	734			
Volume to Capacity	0.08	0.00	0.24			
Queue Length 95th (m)	0.0	0.0	6.4			
Control Delay (s)	0.0	0.2	11.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			27.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Olde Base Line Road & Shaws Creek Road

2031 Traffic
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	88	202	8	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	88	202	8	7	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)						
pX, platoon unblocked						
vC, conflicting volume	210				304	206
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	210				304	206
tC, single (s)	4.3				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1235				689	840

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	93	210	9
Volume Left	5	0	7
Volume Right	0	8	2
cSH	1235	1700	718
Volume to Capacity	0.00	0.12	0.01
Queue Length 95th (m)	0.1	0.0	0.3
Control Delay (s)	0.5	0.0	10.1
Lane LOS	A		B
Approach Delay (s)	0.5	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		21.1%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

6: Rockside Road & Olde Base Line Road

2031 Traffic
PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↗
Volume (veh/h)	75	0	5	213	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	75	0	5	213	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)						
pX, platoon unblocked						
vC, conflicting volume			75		298	75
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			75		298	75
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %						
		100		100		100
cM capacity (veh/h)			1537	695		770

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	75	218	2
Volume Left	0	5	0
Volume Right	0	0	2
cSH	1700	1537	770
Volume to Capacity	0.04	0.00	0.00
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	0.2	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	9.7
Approach LOS			A

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization	25.2%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

7: Mississauga Road & Olde Base Line Road

2031 Traffic
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	1	33	42	6	56	25	123	201	19	14	75	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	33	42	6	56	25	123	201	19	14	75	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)												
pX, platoon unblocked												
vC, conflicting volume	614	570	76	619	562	210	77			220		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	614	570	76	619	562	210	77			220		
tC, single (s)	8.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	4.4	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	92	96	98	86	97	92			99		
cM capacity (veh/h)	236	395	969	337	399	835	1528			1361		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	76	87	343	91								
Volume Left	1	6	123	14								
Volume Right	42	25	19	2								
cSH	580	463	1528	1361								
Volume to Capacity	0.13	0.19	0.08	0.01								
Queue Length 95th (m)	3.1	4.8	1.8	0.2								
Control Delay (s)	12.1	14.6	3.2	1.3								
Lane LOS	B	B	A	A								
Approach Delay (s)	12.1	14.6	3.2	1.3								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.7									
Intersection Capacity Utilization			40.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 13: Mississauga Road & The Grange Side Road

2031 Traffic
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (veh/h)	1	5	8	5	5	5	14	257	4	6	74	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	5	8	5	5	5	14	257	4	6	74	0
Pedestrians		1									1	
Lane Width (m)		3.7									3.7	
Walking Speed (m/s)		1.2									1.2	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	382	376	75	384	374	260	75			261		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	382	376	75	384	374	260	75			261		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.5		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.6		
p0 queue free %	100	99	99	99	99	99	99			99		
cM capacity (veh/h)	564	550	991	563	551	783	1486			1112		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	14	15	275	80								
Volume Left	1	5	14	6								
Volume Right	8	5	4	0								
cSH	739	616	1486	1112								
Volume to Capacity	0.02	0.02	0.01	0.01								
Queue Length 95th (m)	0.4	0.5	0.2	0.1								
Control Delay (s)	10.0	11.0	0.5	0.7								
Lane LOS	A	B	A	A								
Approach Delay (s)	10.0	11.0	0.5	0.7								
Approach LOS	A	B										
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			27.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

14: Mississauga Road & Woodland Court

2031 Traffic
PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	1	251	8	2	77
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	1	251	8	2	77
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	336	255			259	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	336	255			259	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	662	789			1317	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	6	259	79			
Volume Left	5	0	2			
Volume Right	1	8	0			
cSH	681	1700	1317			
Volume to Capacity	0.01	0.15	0.00			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	10.3	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	10.3	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			23.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 15: Mississauga Road & Caletton Mountain Dr

2031 Traffic
 PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	1	225	4	5	80
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	1	225	4	5	80
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	317	227			229	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	317	227			229	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	678	817			1351	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	5	229	85
Volume Left	4	0	5
Volume Right	1	4	0
cSH	702	1700	1351
Volume to Capacity	0.01	0.13	0.00
Queue Length 95th (m)	0.2	0.0	0.1
Control Delay (s)	10.2	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	10.2	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		22.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 16: Mississauga Road & Bush Street/Coffee Shop Access

2031 Traffic
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	15	2	59	2	1	1	171	69	4	2	25	23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	2	59	2	1	1	171	69	4	2	25	23

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	76	4	244	50
Volume Left (vph)	15	2	171	2
Volume Right (vph)	59	1	4	23
Hadj (s)	-0.38	-0.05	0.14	-0.23
Departure Headway (s)	4.2	4.6	4.3	4.1
Degree Utilization, x	0.09	0.01	0.29	0.06
Capacity (veh/h)	794	720	823	848
Control Delay (s)	7.6	7.6	9.0	7.3
Approach Delay (s)	7.6	7.6	9.0	7.3
Approach LOS	A	A	A	A

Intersection Summary			
Delay		8.5	
Level of Service		A	
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 99: Wellington Rd 52/Bush St & Winston Churchill Blvd

2031 Traffic
 PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

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

HCM Unsignalized Intersection Capacity Analysis
 100: Shaws Creek Road & Bush Street

2031 Traffic
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	0	0	0
Volume Left (vph)	0	0	0	0
Volume Right (vph)	0	0	0	0
Hadj (s)	0.00	0.00	0.00	0.00
Departure Headway (s)	3.9	3.9	3.9	3.9
Degree Utilization, x	0.00	0.00	0.00	0.00
Capacity (veh/h)	917	917	917	917
Control Delay (s)	6.9	6.9	6.9	6.9
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS	A	A	A	A

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