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***APPENDIX H***

***Detailed Traffic Analyses for Option 2A***

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HCM Signalized Intersection Capacity Analysis  
5050: Lakeshore Blvd. E (EB) & Simcoe St.

6/3/2010



Movement	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NER
Lane Configurations	↘	↗	↘	↗	↗	↘	↘	↗	↘	↗	↘	↗
Volume (vph)	615	1640	1	643	269	5	133	74	296	127	98	1684
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	3.0	4.0		6.0		7.0	7.0		4.0	7.0		0.0
Lane Util. Factor	1.00	0.95		0.91		1.00	1.00		1.00	1.00		0.76
Frpb, ped/bikes	1.00	1.00		0.99		1.00	0.96		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00		1.00		0.93	1.00		0.93	1.00		1.00
Frt	1.00	1.00		0.96		1.00	0.95		1.00	0.93		0.85
Flt Protected	0.95	1.00		1.00		0.95	1.00		0.95	1.00		1.00
Satd. Flow (prot)	1642	3348		4413		1310	1573		1533	1613		3382
Flt Permitted	0.95	1.00		1.00		0.53	1.00		0.57	1.00		1.00
Satd. Flow (perm)	1642	3348		4413		734	1573		915	1613		3382
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	615	1640	1	643	269	5	133	74	296	127	98	1684
RTOR Reduction (vph)	0	0	0	68	0	0	4	0	0	0	0	4
Lane Group Flow (vph)	615	1641	0	845	0	5	203	0	296	225	0	1758
Confl. Peds. (#/hr)	9		13		9	98		89	89			
Heavy Vehicles (%)	3%	1%	9%	5%	3%	20%	1%	7%	3%	4%	2%	2%
Turn Type	Prot			Perm			Perm			custom		
Protected Phases	5	2	6		8		8		4		12	
Permitted Phases				8			4			12		
Actuated Green, G (s)	39.0	56.0	22.0		32.0		32.0		32.0		67.0	
Effective Green, g (s)	42.0	58.0	22.0		32.0		32.0		35.0		69.0	
Actuated g/C Ratio	0.38	0.52	0.20		0.29		0.29		0.31		0.62	
Clearance Time (s)	6.0	6.0	6.0		7.0		7.0		7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	616	1734	867		210		449		286		461	
v/s Ratio Prot	c0.37	c0.49	0.19		0.01		0.13		0.14		0.52	
v/s Ratio Perm				0.01			c0.32			0.52		
v/c Ratio	1.00	0.95	0.97		0.02		0.45		1.03		0.84	
Uniform Delay, d1	35.0	25.5	44.7		28.8		32.8		38.5		33.2	
Progression Factor	1.05	0.64	0.53		1.00		1.00		0.95		0.96	
Incremental Delay, d2	66.4	14.0	38.1		0.0		0.7		144.2		0.8	
Delay (s)	103.3	30.4	62.0		28.8		33.5		180.9		21.8	
Level of Service	F	C	E		C		C		F		C	
Approach Delay (s)	50.3		62.0		33.4		116.8					
Approach LOS	D		E		C		F					

Intersection Summary

HCM Average Control Delay	48.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	150.4%	ICU Level of Service	H
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
5050: Lakeshore Blvd. E (EB) & Simcoe St.

6/3/2010



Movement	NER2
Lane Configurations	↗
Volume (vph)	78
Ideal Flow (vphpl)	2000
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	78
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Average Control Delay		HCM Level of Service	
HCM Volume to Capacity ratio			
Actuated Cycle Length (s)		Sum of lost time (s)	
Intersection Capacity Utilization		ICU Level of Service	
Analysis Period (min)			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

5070: Lakeshore Blvd. E (WB) & York St.

6/3/2010



Movement	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	SBT	SBR	SBR2
Lane Configurations		↑↑↑	↑↑				↑↑	↑↑		
Volume (vph)	73	943	551	251	67	19	1006	191	82	393
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0	4.0				5.0	8.0		
Lane Util. Factor		0.91	0.88				0.95	0.95		
Flpb, ped/bikes		1.00	0.80				1.00	0.92		
Flpb, ped/bikes		0.99	1.00				1.00	1.00		
Frt		1.00	0.85				1.00	0.89		
Flt Protected		1.00	1.00				1.00	1.00		
Satd. Flow (prot)		4559	2031				3207	2547		
Flt Permitted		1.00	1.00				0.78	1.00		
Satd. Flow (perm)		4559	2031				2526	2547		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	943	551	251	67	19	1006	191	82	393
RTOR Reduction (vph)	0	0	38	0	0	0	0	111	0	0
Lane Group Flow (vph)	0	1016	764	0	0	0	1092	555	0	0
Confl. Peds. (#/hr)	41		63			86			86	
Heavy Vehicles (%)	14%	5%	4%	6%	1%	10%	5%	13%	38%	2%
Turn Type	Perm	Perm	Perm	pm+pt	pm+pt					
Protected Phases		6		3	3		8	4		
Permitted Phases	6		6		8					
Actuated Green, G (s)		41.0	41.0				57.0	42.0		
Effective Green, g (s)		41.0	43.0				60.0	42.0		
Actuated g/C Ratio		0.37	0.38				0.54	0.38		
Clearance Time (s)		6.0	6.0				8.0	8.0		
Vehicle Extension (s)		3.0	3.0				3.0	3.0		
Lane Grp Cap (vph)		1669	780				1444	955		
v/s Ratio Prot							c0.10	0.22		
v/s Ratio Perm		0.22	c0.38				0.30			
v/c Ratio		0.61	0.98				0.76	0.58		
Uniform Delay, d1		29.0	34.1				20.3	28.0		
Progression Factor		0.34	0.28				0.76	0.56		
Incremental Delay, d2		0.8	28.5				3.1	2.5		
Delay (s)		10.7	38.0				18.4	18.2		
Level of Service		B	D				B	B		
Approach Delay (s)		22.7					18.4	18.2		
Approach LOS		C					B	B		

Intersection Summary

HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	107.4%	ICU Level of Service	G
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

5080: Lakeshore Blvd. E (WB) & Bay St.

6/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑			↑	↑↑
Volume (vph)	0	0	0	212	1761	301	157	1035	0	0	181	221
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					7.0		7.0	7.0			0.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Flpb, ped/bikes					0.96		1.00	1.00			1.00	1.00
Flpb, ped/bikes					0.99		0.66	1.00			1.00	1.00
Frt					0.98		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					5421		1070	3252			1589	2421
Flt Permitted					1.00		0.55	1.00			1.00	1.00
Satd. Flow (perm)					5421		624	3252			1589	2421
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	212	1761	301	157	1035	0	0	181	221
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	137
Lane Group Flow (vph)	0	0	0	0	2267	0	157	1035	0	0	181	84
Confl. Peds. (#/hr)	171			54	54	171	942		193	193		942
Heavy Vehicles (%)	0%	0%	0%	3%	5%	4%	5%	4%	1%	0%	12%	10%
Turn Type				Perm			Perm				custom	
Protected Phases					6			8			4	3
Permitted Phases				6			8					3
Actuated Green, G (s)					49.0		49.0	49.0			49.0	18.0
Effective Green, g (s)					49.0		49.0	49.0			51.0	18.0
Actuated g/C Ratio					0.44		0.44	0.44			0.46	0.16
Clearance Time (s)					7.0		7.0	7.0				7.0
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Lane Grp Cap (vph)					2372		273	1423			724	389
v/s Ratio Prot								c0.32			0.11	0.03
v/s Ratio Perm					0.42		0.25					
v/c Ratio					0.96		0.58	0.73			0.25	0.22
Uniform Delay, d1					30.4		23.7	26.0			18.7	40.9
Progression Factor					0.53		1.01	1.01			1.00	1.00
Incremental Delay, d2					5.6		7.6	2.9			0.8	1.3
Delay (s)					21.7		31.5	29.2			19.6	42.1
Level of Service					C		C	C			B	D
Approach Delay (s)		0.0			21.7		29.5				32.0	
Approach LOS		A			C		C				C	

Intersection Summary

HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

6070: Harbour Street & York St.

6/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘ ↙	↕	↘ ↙				↕	↕			↕	↕
Volume (vph)	652	2769	66	0	0	0	0	340	55	143	156	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	4.0						8.0			4.0	
Lane Util. Factor	1.00	0.91						0.95			0.95	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Flpb, ped/bikes	0.98	1.00						1.00			1.00	
Frt	1.00	1.00						0.98			1.00	
Flt Protected	0.95	1.00						1.00			0.98	
Satd. Flow (prot)	1629	4654						3192			3038	
Flt Permitted	0.95	1.00						1.00			0.63	
Satd. Flow (perm)	1629	4654						3192			1972	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	652	2769	66	0	0	0	0	340	55	143	156	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	652	2833	0	0	0	0	0	390	0	0	299	0
Confl. Peds. (#/hr)	20		50	50		20	342		6	6		342
Heavy Vehicles (%)	2%	4%	0%	0%	0%	0%	3%	6%	7%	10%	0%	
Turn Type	Perm						pm+pt					
Protected Phases	2						8		7		4	
Permitted Phases	2								4			
Actuated Green, G (s)	68.0	68.0						20.0			30.0	
Effective Green, g (s)	68.0	70.0						20.0			34.0	
Actuated g/C Ratio	0.61	0.62						0.18			0.30	
Clearance Time (s)	6.0	6.0						8.0			8.0	
Vehicle Extension (s)	3.0	3.0						3.0			3.0	
Lane Grp Cap (vph)	989	2909						570			703	
v/s Ratio Prot	c0.61						c0.12				c0.04	
v/s Ratio Perm	0.40										0.09	
v/c Ratio	0.66	0.97						0.68			0.43	
Uniform Delay, d1	14.4	20.1						43.0			31.2	
Progression Factor	1.16	0.93						1.00			1.09	
Incremental Delay, d2	2.3	12.2						6.8			1.6	
Delay (s)	19.0	31.0						49.8			35.7	
Level of Service	B C						D				D	
Approach Delay (s)	28.8				0.0		49.8				35.7	
Approach LOS	C				A		D				D	

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

6080: Harbour Street & Bay St.

6/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘ ↙	↕	↘ ↙				↕	↕			↕	↕
Volume (vph)	872	1909	60	0	0	0	0	427	46	164	298	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.0	7.0						7.0			0.0	7.0
Lane Util. Factor	1.00	0.91						0.91			1.00	0.95
Flpb, ped/bikes	1.00	1.00						0.97			1.00	1.00
Flpb, ped/bikes	1.00	1.00						1.00			0.95	1.00
Frt	1.00	1.00						0.99			1.00	1.00
Flt Protected	0.95	1.00						1.00			0.95	1.00
Satd. Flow (prot)	1654	4639						4370			1408	3075
Flt Permitted	0.95	1.00						1.00			0.40	1.00
Satd. Flow (perm)	1654	4639						4370			593	3075
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	872	1909	60	0	0	0	0	427	46	164	298	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	872	1966	0	0	0	0	0	469	0	164	298	0
Confl. Peds. (#/hr)	3		125	0%	0%	0%	3	1078		203	203	
Heavy Vehicles (%)	2%	4%	2%	0%	0%	0%	0%	6%	11%	14%	10%	0%
Turn Type	Perm						pm+pt					
Protected Phases	2						8		7		4	
Permitted Phases	2								4			
Actuated Green, G (s)	70.7	70.7						17.3			27.3	27.3
Effective Green, g (s)	70.7	70.7						17.3			30.3	27.3
Actuated g/C Ratio	0.63	0.63						0.15			0.27	0.24
Clearance Time (s)	7.0	7.0						7.0			3.0	7.0
Vehicle Extension (s)	3.0	3.0						3.0			3.0	3.0
Lane Grp Cap (vph)	1044	2928						675			233	750
v/s Ratio Prot	c0.53						c0.11				c0.06 0.10	
v/s Ratio Perm	0.84										0.13	
v/c Ratio	0.84	0.67						0.69			0.70	0.40
Uniform Delay, d1	16.1	13.2						44.8			34.0	35.5
Progression Factor	1.02	1.14						1.00			0.98	0.94
Incremental Delay, d2	3.0	0.4						3.2			9.6	0.3
Delay (s)	19.4	15.5						48.0			42.8	33.6
Level of Service	B B						D				D C	
Approach Delay (s)	16.7				0.0		48.0				36.9	
Approach LOS	B				A		D				D	

Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
7050: Queens Quay & Simcoe St.

6/3/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Volume (vph)	55	720	0	88	395	58	0	0	0	177	35	66
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.0	7.0		5.0	7.0					7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00					1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	0.96					1.00	0.87	
Flpb, ped/bikes	0.84	1.00		1.00	1.00					0.83	1.00	
Frt	1.00	1.00		1.00	0.98					1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00					0.95	1.00	
Satd. Flow (prot)	1361	1679		1658	1495					1298	1304	
Flt Permitted	0.50	1.00		0.95	1.00					0.76	1.00	
Satd. Flow (perm)	719	1679		1658	1495					1034	1304	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	55	720	0	88	395	58	0	0	0	177	35	66
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	50	0
Lane Group Flow (vph)	55	720	0	88	449	0	0	0	0	177	51	0
Confl. Peds. (#/hr)	173				173					66		70
Heavy Vehicles (%)	4%	6%	2%	2%	12%	13%	2%	2%	2%	8%	2%	10%
Turn Type	Perm			Prot			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			1			8			4		
Actuated Green, G (s)	62.5	62.5		8.5	76.0					29.3	29.3	
Effective Green, g (s)	62.5	62.5		8.5	76.0					29.3	29.3	
Actuated g/C Ratio	0.52	0.52		0.07	0.64					0.25	0.25	
Clearance Time (s)	7.0	7.0		5.0	7.0					7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)	377	880		118	952					254	320	
v/s Ratio Prot		c0.43		c0.05	0.30						0.04	
v/s Ratio Perm	0.08									c0.17		
v/c Ratio	0.15	0.82		0.75	0.47					0.70	0.16	
Uniform Delay, d1	14.6	23.7		54.3	11.2					41.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00					1.00	1.00	
Incremental Delay, d2	0.8	9.0		25.3	1.7					8.4	0.2	
Delay (s)	15.5	32.6		79.6	12.9					49.4	35.6	
Level of Service	B	C		E	B					D	D	
Approach Delay (s)		31.4			23.8		0.0				44.4	
Approach LOS		C			C		A				D	
<b>Intersection Summary</b>												
HCM Average Control Delay		31.1										C
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		119.3			Sum of lost time (s)		19.0					
Intersection Capacity Utilization		94.1%			ICU Level of Service							F
Analysis Period (min)		60										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
7070: Queens Quay & York St.

6/3/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Volume (vph)	126	696	29	12	479	220	29	39	13	105	15	112
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.0	7.0		5.0	7.0					7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Flpb, ped/bikes	1.00	0.99		1.00	1.00	0.83				0.98	1.00	0.49
Flpb, ped/bikes	0.92	1.00		1.00	1.00	1.00				0.82	0.92	1.00
Frt	1.00	0.99		1.00	1.00	0.85				0.98	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.98	0.95	1.00
Satd. Flow (prot)	1513	1603		1353	1604	1148				1275	1463	1575
Flt Permitted	0.48	1.00		0.95	1.00	1.00				0.90	0.74	1.00
Satd. Flow (perm)	767	1603		1353	1604	1148				1164	1142	1575
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	126	696	29	12	479	220	29	39	13	105	15	112
RTOR Reduction (vph)	0	1	0	0	0	76	0	6	0	0	0	86
Lane Group Flow (vph)	126	724	0	12	479	144	0	75	0	105	15	26
Confl. Peds. (#/hr)	115			125	125		115	241		45	45	241
Heavy Vehicles (%)	3%	9%	10%	25%	11%	10%	3%	8%	23%	6%	13%	5%
Turn Type	Perm			Prot		Perm	Perm			Perm		Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			1		6	8			4		4
Actuated Green, G (s)	73.2	73.2		2.0	80.2	80.2		28.0		28.0	28.0	28.0
Effective Green, g (s)	73.2	73.2		2.0	80.2	80.2		28.0		28.0	28.0	28.0
Actuated g/C Ratio	0.60	0.60		0.02	0.66	0.66		0.23		0.23	0.23	0.23
Clearance Time (s)	7.0	7.0		5.0	7.0	7.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	459	960		22	1053	753		267		262	361	161
v/s Ratio Prot		c0.45		0.01	c0.30						0.01	
v/s Ratio Perm	0.16					0.13		0.06		c0.09		0.04
v/c Ratio	0.27	0.75		0.55	0.45	0.19		0.28		0.40	0.04	0.16
Uniform Delay, d1	11.8	17.9		59.6	10.3	8.3		38.8		40.0	36.7	37.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	5.7		27.0	1.4	0.6		0.6		1.0	0.0	0.5
Delay (s)	13.2	23.6		86.6	11.7	8.8		39.4		41.0	36.7	38.2
Level of Service	B	C		F	B	A		D		D	D	D
Approach Delay (s)		22.1			12.1			39.4			39.3	
Approach LOS		C			B			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay		21.2										C
HCM Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		122.2			Sum of lost time (s)		21.0					
Intersection Capacity Utilization		92.3%			ICU Level of Service							F
Analysis Period (min)		60										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7080: Queens Quay & Bay St.

6/3/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔		↔↔		↔	↔	
Volume (vph)	111	566	8	16	657	291	5	35	25	179	12	231
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	0.82		0.86		1.00	0.76	
Flpb, ped/bikes	1.00	1.00		0.93	1.00	1.00		0.99		0.69	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.94		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1658	1672		1536	1679	1120		2659		1017	1112	
Flt Permitted	0.19	1.00		0.43	1.00	1.00		0.93		0.71	1.00	
Satd. Flow (perm)	323	1672		688	1679	1120		2487		762	1112	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	566	8	16	657	291	5	35	25	179	12	231
RTOR Reduction (vph)	0	0	0	0	0	74	0	18	0	0	131	0
Lane Group Flow (vph)	111	574	0	16	657	217	0	47	0	179	112	0
Confl. Peds. (#/hr)	149	90	90	149	149	136		191	191		136	
Heavy Vehicles (%)	2%	6%	2%	2%	6%	11%	2%	2%	2%	15%	2%	4%
Turn Type	pm+pt		Perm		Perm	Perm	Perm		Perm		Perm	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	59.0	59.0		48.0	48.0	48.0		29.6		29.6	29.6	
Effective Green, g (s)	59.0	59.0		48.0	48.0	48.0		29.6		29.6	29.6	
Actuated g/C Ratio	0.58	0.58		0.47	0.47	0.47		0.29		0.29	0.29	
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	264	961		322	785	524		717		220	321	
v/s Ratio Prot	0.02	c0.34			c0.39					c0.23		0.10
v/s Ratio Perm	0.22			0.02		0.19		0.02				
v/c Ratio	0.42	0.60		0.05	0.84	0.41		0.07		0.81	0.35	
Uniform Delay, d1	14.9	14.1		14.9	23.9	18.0		26.5		33.9	28.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	1.1	2.8		0.3	11.3	2.4		0.0		23.3	0.7	
Delay (s)	16.0	16.9		15.2	35.2	20.4		26.5		57.2	29.5	
Level of Service	B	B		B	D	C		C		E	C	
Approach Delay (s)	16.7			30.4				26.5			41.3	
Approach LOS	B			C				C			D	

Intersection Summary

HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	102.6	Sum of lost time (s)	21.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	60		
c Critical Lane Group			

Queues

5050: Lakeshore Blvd. E (EB) & Simcoe St.

6/8/2010



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	NER
Lane Group Flow (vph)	615	1641	912	5	207	296	225	1762
w/c Ratio	1.00	0.95	0.98	0.02	0.46	1.03	0.49	0.80
Control Delay	104.0	31.4	60.5	29.4	36.0	181.8	36.1	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.0	31.4	60.5	29.4	36.0	181.8	36.1	17.7
Queue Length 50th (m)	116.9	107.5	63.0	0.8	36.3	-70.1	38.7	111.7
Queue Length 95th (m)	m#210.5	m#258.1	m#114.5	4.2	66.9	#144.1	69.3	180.5
Internal Link Dist (m)		218.1	12.5		97.1		195.5	
Turn Bay Length (m)								
Base Capacity (vph)	616	1734	935	210	453	286	461	2208
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 w/c Ratio	1.00	0.95	0.98	0.02	0.46	1.03	0.49	0.80

Intersection Summary

- Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

5070: Lakeshore Blvd. E (WB) & York St.

6/8/2010



Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	1016	802	1092	666
w/c Ratio	0.61	0.98	0.77	0.62
Control Delay	10.7	40.0	18.6	14.2
Queue Delay	0.0	0.0	33.1	0.0
Total Delay	10.7	40.0	51.7	14.3
Queue Length 50th (m)	26.9	53.4	51.0	47.9
Queue Length 95th (m)	m34.3	m#22.8	132.8	79.7
Internal Link Dist (m)	69.2		39.0	135.0
Turn Bay Length (m)				
Base Capacity (vph)	1668	818	1415	1066
Starvation Cap Reductn	0	0	328	0
Spillback Cap Reductn	0	0	0	3
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.61	0.98	1.00	0.63

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

5080: Lakeshore Blvd. E (WB) & Bay St.

6/8/2010



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	2274	157	1035	181	221
v/c Ratio	0.96	0.58	0.73	0.23	0.42
Control Delay	22.6	33.2	29.6	16.8	15.3
Queue Delay	0.0	0.0	3.3	0.0	0.0
Total Delay	22.6	33.2	32.9	16.8	15.3
Queue Length 50th (m)	110.3	25.0	88.6	21.5	6.2
Queue Length 95th (m)	m119.0	m38.2	m112.6	40.0	23.0
Internal Link Dist (m)	145.6		40.6	301.1	
Turn Bay Length (m)		30.0			50.0
Base Capacity (vph)	2378	273	1423	795	526
Starvation Cap Reductn	0	0	277	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.58	0.90	0.23	0.42

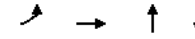
Intersection Summary

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

Queues

6070: Harbour Street & York St.

6/8/2010



Lane Group	EBL	EBT	NBT	SBT
Lane Group Flow (vph)	652	2835	395	299
v/c Ratio	0.66	0.97	0.69	0.46
Control Delay	19.7	31.4	49.6	35.6
Queue Delay	1.5	0.0	0.0	6.9
Total Delay	21.2	31.4	49.6	42.5
Queue Length 50th (m)	78.2	128.4	42.3	25.4
Queue Length 95th (m)	m105.5	m#281.7	#67.7	43.3
Internal Link Dist (m)		146.3	106.9	39.0
Turn Bay Length (m)				
Base Capacity (vph)	989	2913	575	656
Starvation Cap Reductn	0	0	0	299
Spillback Cap Reductn	170	0	1	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.97	0.69	0.84

Intersection Summary

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

Queue shown is maximum after two cycles.

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

Queues

6080: Harbour Street & Bay St.

6/8/2010



Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	872	1969	473	164	298
v/c Ratio	0.84	0.67	0.69	0.66	0.40
Control Delay	21.4	16.2	50.0	43.4	34.4
Queue Delay	1.4	0.0	0.0	0.0	0.0
Total Delay	22.7	16.2	50.0	43.4	34.4
Queue Length 50th (m)	94.2	76.4	35.9	28.1	28.2
Queue Length 95th (m)	m104.0	m83.7	51.9	m47.4	m41.3
Internal Link Dist (m)		181.9	102.3		24.5
Turn Bay Length (m)				35.0	
Base Capacity (vph)	1044	2928	940	249	933
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	54	19	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	0.68	0.50	0.66	0.32

Intersection Summary

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

Queues

7050: Queens Quay & Simcoe St.

6/8/2010



Lane Group	EBL	EBT	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	55	720	88	453	177	101
v/c Ratio	0.15	0.82	0.75	0.47	0.70	0.27
Control Delay	16.4	34.0	95.3	13.0	58.0	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	34.0	95.3	13.0	58.0	16.9
Queue Length 50th (m)	6.4	135.7	20.4	49.2	37.9	6.4
Queue Length 95th (m)	16.1	#258.8	#54.3	89.1	#82.3	25.3
Internal Link Dist (m)		299.9		195.8		97.1
Turn Bay Length (m)	55.0		50.0			
Base Capacity (vph)	376	879	125	956	259	377
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.82	0.70	0.47	0.68	0.27

Intersection Summary

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

Queues

7070: Queens Quay & York St.

6/8/2010



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	126	725	12	479	220	81	105	15	112
v/c Ratio	0.27	0.74	0.21	0.46	0.27	0.29	0.39	0.04	0.44
Control Delay	13.7	23.2	64.5	12.3	1.9	36.9	43.5	35.7	13.0
Queue Delay	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	24.9	64.5	12.3	1.9	36.9	43.5	35.7	13.0
Queue Length 50th (m)	11.5	100.1	2.8	51.9	0.0	14.0	20.8	2.7	0.0
Queue Length 95th (m)	31.6	#251.3	10.1	89.0	11.5	32.0	43.0	9.3	22.4
Internal Link Dist (m)		195.8		64.4		9.7		106.9	
Turn Bay Length (m)	40.0		40.0		40.0		20.0		
Base Capacity (vph)	470	986	57	1039	824	290	278	383	257
Starvation Cap Reductn	0	124	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.84	0.21	0.46	0.27	0.28	0.38	0.04	0.44

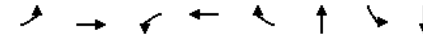
Intersection Summary

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

Queues

7080: Queens Quay & Bay St.

6/8/2010



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	111	574	16	657	291	65	179	243
v/c Ratio	0.41	0.60	0.05	0.84	0.49	0.09	0.81	0.54
Control Delay	13.9	17.4	15.7	36.4	12.6	18.4	69.0	13.4
Queue Delay	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
Total Delay	13.9	17.4	15.7	37.5	12.6	18.4	69.0	13.4
Queue Length 50th (m)	9.1	70.0	1.7	111.7	18.9	3.0	33.1	8.8
Queue Length 95th (m)	18.6	125.0	6.2	#215.3	52.7	9.2	#82.9	42.7
Internal Link Dist (m)		181.6		165.2		30.2		102.3
Turn Bay Length (m)	30.0		30.0		40.0			
Base Capacity (vph)	270	962	322	785	598	744	223	455
Starvation Cap Reductn	0	0	0	28	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	0.41	0.60	0.05	0.87	0.49	0.09	0.80	0.53

Intersection Summary

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

HCM Unsignalized Intersection Capacity Analysis  
9674: Harbour Street & N/S Link

6/3/2010



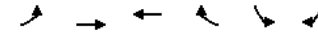
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑					↑
Volume (veh/h)	2823	145	0	0	0	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2823	145	0	0	0	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	85			206		
pX, platoon unblocked			0.46		0.46	0.46
vC, conflicting volume			2968		2896	778
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			739		466	494

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	NB 1
Volume Total	807	807	807	548	23
Volume Left	0	0	0	0	0
Volume Right	0	0	0	145	23
cSH	1700	1700	1700	1700	494
Volume to Capacity	0.47	0.47	0.47	0.32	0.05
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.1
Control Delay (s)	0.0	0.0	0.0	0.0	12.6
Lane LOS					B
Approach Delay (s)	0.0				12.6
Approach LOS					B

Intersection Summary	
Average Delay	0.1
Intersection Capacity Utilization	51.2% ICU Level of Service A
Analysis Period (min)	60

HCM Unsignalized Intersection Capacity Analysis  
9771: Queens Quay & N/S Link

6/3/2010



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	68	733	761	190	32	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	68	733	761	190	32	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		88	205			
pX, platoon unblocked	0.65				0.82	0.65
vC, conflicting volume	951				1725	856
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652				811	506
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				87	96
cM capacity (veh/h)	605				255	367

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	68	733	951	47
Volume Left	68	0	0	32
Volume Right	0	0	190	15
cSH	605	1700	1700	283
Volume to Capacity	0.11	0.43	0.56	0.17
Queue Length 95th (m)	2.9	0.0	0.0	4.5
Control Delay (s)	11.7	0.0	0.0	20.3
Lane LOS	B			C
Approach Delay (s)	1.0		0.0	20.3
Approach LOS				C

Intersection Summary	
Average Delay	1.0
Intersection Capacity Utilization	63.7% ICU Level of Service B
Analysis Period (min)	60

HCM Signalized Intersection Capacity Analysis

5050: Lakeshore Blvd. E (EB) & Simcoe St.

6/8/2010



Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NER	NER2
Lane Configurations	↘	↗	↗	↗	↘	↗		↘	↗		↗	↗
Volume (vph)	212	1303	1119	187	30	116	88	527	149	337	1078	39
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	3.0	4.0	6.0		7.0	7.0		1.0	7.0		0.0	
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00		1.00	1.00		0.76	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	0.96		1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00		0.95	1.00		0.96	1.00		1.00	
Frt	1.00	1.00	0.98		1.00	0.94		1.00	0.90		0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1642	3349	4524		1336	1535		1584	1554		3382	
Flt Permitted	0.95	1.00	1.00		0.48	1.00		0.56	1.00		1.00	
Satd. Flow (perm)	1642	3349	4524		670	1535		927	1554		3382	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	212	1303	1119	187	30	116	88	527	149	337	1078	39
RTOR Reduction (vph)	0	0	20	0	0	19	0	0	0	0	3	0
Lane Group Flow (vph)	212	1303	1286	0	30	185	0	527	486	0	1114	0
Confl. Peds. (#/hr)	9		9	98		89	89					
Heavy Vehicles (%)	3%	1%	5%	3%	20%	1%	7%	3%	4%	2%	2%	2%
Turn Type	Prot			Perm			pm+pt		custom			
Protected Phases	5	2	6		8	8		7	4			
Permitted Phases					8			4			1	2
Actuated Green, G (s)	12.0	43.0	33.0		32.0	32.0		48.0	48.0		51.0	
Effective Green, g (s)	15.0	45.0	33.0		32.0	32.0		51.0	48.0		53.0	
Actuated g/C Ratio	0.13	0.40	0.29		0.29	0.29		0.46	0.43		0.47	
Clearance Time (s)	6.0	6.0	6.0		7.0	7.0		4.0	7.0		8.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	220	1346	1333		191	439		510	666		1600	
v/s Ratio Prot	c0.13	c0.39	0.28			0.12		c0.14	c0.31			
v/s Ratio Perm					0.04			0.33			0.33	
v/c Ratio	0.96	0.97	0.96		0.16	0.42		1.03	0.73		0.70	
Uniform Delay, d1	48.2	32.8	38.9		29.9	32.5		28.6	26.6		23.2	
Progression Factor	0.73	0.97	0.68		1.00	1.00		0.89	0.90		1.00	
Incremental Delay, d2	80.3	24.9	20.0		0.4	0.7		116.3	7.2		2.6	
Delay (s)	115.7	56.9	46.6		30.3	33.1		141.6	31.1		25.7	
Level of Service	F	E	D		C	C		F	C		C	
Approach Delay (s)		65.1	46.6			32.8			88.6			
Approach LOS		E	D			C			F			

Intersection Summary

HCM Average Control Delay	55.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	138.2%	ICU Level of Service	H
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

5070: Lakeshore Blvd. E (WB) & York St.

6/8/2010



Movement	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	SBT	SBR	SBR2
Lane Configurations		↗	↗	↗			↗	↗		
Volume (vph)	96	1345	826	146	116	25	651	357	119	506
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0	4.0				5.0	6.0		
Lane Util. Factor		0.91	0.88				0.95	0.95		
Flpb, ped/bikes		1.00	0.84				1.00	0.95		
Flpb, ped/bikes		1.00	1.00				1.00	1.00		
Frt		1.00	0.85				1.00	0.90		
Flt Protected		1.00	1.00				0.99	1.00		
Satd. Flow (prot)		4651	2188				3209	2637		
Flt Permitted		1.00	1.00				0.55	1.00		
Satd. Flow (perm)		4651	2188				1774	2637		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	96	1345	826	146	116	25	651	357	119	506
RTOR Reduction (vph)	0	0	12	0	0	0	0	50	0	0
Lane Group Flow (vph)	0	1441	960	0	0	0	792	932	0	0
Confl. Peds. (#/hr)	41		63			86		86		
Heavy Vehicles (%)	14%	3%	1%	6%	1%	50%	3%	15%	28%	2%
Turn Type	Perm		Perm		Perm		Perm			
Protected Phases		6					8	4		
Permitted Phases	6		6		8	8				
Actuated Green, G (s)		48.0	48.0				50.0	50.0		
Effective Green, g (s)		48.0	50.0				53.0	52.0		
Actuated g/C Ratio		0.43	0.45				0.47	0.46		
Clearance Time (s)		6.0	6.0				8.0	8.0		
Vehicle Extension (s)		3.0	3.0				3.0	3.0		
Lane Grp Cap (vph)		1993	977				839	1224		
v/s Ratio Prot								0.35		
v/s Ratio Perm		0.31	c0.44				c0.45			
v/c Ratio		0.72	0.98				0.94	0.91dr		
Uniform Delay, d1		26.5	30.6				28.1	24.9		
Progression Factor		0.37	0.36				1.04	0.72		
Incremental Delay, d2		1.1	27.3				24.9	4.5		
Delay (s)		11.0	38.2				54.2	22.4		
Level of Service		B	D				D	C		
Approach Delay (s)		21.9					54.2	22.4		
Approach LOS		C					D	C		

Intersection Summary

HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	121.6%	ICU Level of Service	H
Analysis Period (min)	60		
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

5080: Lakeshore Blvd. E (WB) & Bay St.

6/8/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				← ↑ →	← ↑ →	← ↑ →	← ↑ →	← ↑ →			← ↑ →	← ↑ →
Volume (vph)	0	0	0	126	1989	175	161	561	0	0	405	421
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.0	7.0	7.0					0.0	5.0
Lane Util. Factor				0.86	1.00	0.95					1.00	0.88
Frpb, ped/bikes				0.97	1.00	1.00					1.00	1.00
Flpb, ped/bikes				0.99	0.84	1.00					1.00	1.00
Frt				0.99	1.00	1.00					1.00	0.85
Flt Protected				1.00	0.95	1.00					1.00	1.00
Satd. Flow (prot)				5716	1372	3131					1712	2611
Flt Permitted				1.00	0.33	1.00					1.00	1.00
Satd. Flow (perm)				5716	483	3131					1712	2611
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	126	1989	175	161	561	0	0	405	421
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	0	0	0	78
Lane Group Flow (vph)	0	0	0	2279	0	161	561	0	0	405	343	0
Confl. Peds. (#/hr)	260		66	66	260	948		289	289		948	
Heavy Vehicles (%)	0%	0%	0%	2%	2%	4%	4%	8%	1%	0%	4%	2%
Turn Type				Perm	Perm	Perm	Perm	Perm			Perm	custom
Protected Phases				6	6	8	8	4	3		3	3
Permitted Phases				6		8		3				
Actuated Green, G (s)				49.0	49.0	49.0	49.0	49.0	17.0		17.0	
Effective Green, g (s)				51.0	49.0	49.0	51.0	51.0	19.0		19.0	
Actuated g/C Ratio				0.46	0.44	0.44	0.46	0.46	0.17		0.17	
Clearance Time (s)				7.0	7.0	7.0	7.0	7.0			7.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				2603	211	1370		780	443		443	
v/s Ratio Prot						0.18		0.24	0.13		0.13	
v/s Ratio Perm				0.40	c0.33							
v/c Ratio				0.88	0.76	0.41		0.52	0.77		0.77	
Uniform Delay, d1				27.6	26.6	21.6		21.8	44.4		44.4	
Progression Factor				0.36	0.92	0.88		1.00	1.00		1.00	
Incremental Delay, d2				1.6	22.5	0.8		0.6	8.7		8.7	
Delay (s)				11.6	46.9	19.9		22.3	53.1		53.1	
Level of Service				B	D	B		C	D		D	
Approach Delay (s)		0.0		11.6		25.9		38.0				
Approach LOS		A		B		C		D				

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

6070: Harbour Street & York St.

6/8/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	← ↑ →	← ↑ →	← ↑ →	← ↑ →	← ↑ →	← ↑ →	← ↑ →	← ↑ →			← ↑ →	← ↑ →
Volume (vph)	424	2133	29	0	0	0	0	310	83	366	136	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0						8.0			8.0	
Lane Util. Factor	1.00	0.91						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						0.99			1.00	
Flpb, ped/bikes	0.97	1.00						1.00			0.99	
Frt	1.00	1.00						0.97			1.00	
Flt Protected	0.95	1.00						1.00			0.96	
Satd. Flow (prot)	1606	4752						3165			3176	
Flt Permitted	0.95	1.00						1.00			0.58	
Satd. Flow (perm)	1606	4752						3165			1902	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	424	2133	29	0	0	0	0	310	83	366	136	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	424	2161	0	0	0	0	0	377	0	0	502	0
Confl. Peds. (#/hr)	31		48	48	31	451		19	19		451	
Heavy Vehicles (%)	2%	2%	0%	0%	0%	0%	0%	3%	1%	0%	8%	0%
Turn Type								pm+pt				
Protected Phases		2						8	7		4	
Permitted Phases		2							4			
Actuated Green, G (s)	55.0	55.0						22.0			43.0	
Effective Green, g (s)	55.0	55.0						22.0			43.0	
Actuated g/C Ratio	0.49	0.49						0.20			0.38	
Clearance Time (s)	6.0	6.0						8.0			8.0	
Vehicle Extension (s)	3.0	3.0						3.0			3.0	
Lane Grp Cap (vph)	789	2334						622			924	
v/s Ratio Prot		c0.45						c0.12			c0.08	
v/s Ratio Perm	0.26										0.13	
v/c Ratio	0.54	0.93						0.61			0.99dl	
Uniform Delay, d1	19.7	26.6						41.0			26.9	
Progression Factor	0.88	0.77						1.00			0.74	
Incremental Delay, d2	2.0	6.8						4.4			1.7	
Delay (s)	19.2	27.2						45.5			21.6	
Level of Service	B	C						D			C	
Approach Delay (s)		25.9			0.0			45.5			21.6	
Approach LOS		C			A			D			C	

Intersection Summary			
HCM Average Control Delay	27.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	60		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

6080: Harbour Street & Bay St.

6/8/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔					↔↔↔			↔	↔↔	
Volume (vph)	749	2001	48	0	0	0	0	395	73	238	262	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.0	7.0						7.0		0.0	7.0	
Lane Util. Factor	1.00	0.91						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						0.95		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		0.94	1.00	
Frt	1.00	1.00						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1654	4647						4243		1398	3075	
Flt Permitted	0.95	1.00						1.00		0.44	1.00	
Satd. Flow (perm)	1654	4647						4243		643	3075	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	749	2001	48	0	0	0	0	395	73	238	262	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	749	2047	0	0	0	0	0	466	0	238	262	0
Confl. Peds. (#/hr)	3		125				3	1078		203	203	
Heavy Vehicles (%)	2%	4%	2%	0%	0%	0%	0%	6%	11%	14%	10%	0%
Turn Type	Perm							pm+pt				
Protected Phases	2							8		7		4
Permitted Phases	2									4		
Actuated Green, G (s)	60.0	60.0						25.0	38.0		38.0	
Effective Green, g (s)	60.0	60.0						25.0	41.0		38.0	
Actuated g/C Ratio	0.54	0.54						0.22	0.37		0.34	
Clearance Time (s)	7.0	7.0						7.0	3.0		7.0	
Vehicle Extension (s)	3.0	3.0						3.0	3.0		3.0	
Lane Grp Cap (vph)	886	2489						947	323		1043	
v/s Ratio Prot	0.44							c0.11	c0.09		0.09	
v/s Ratio Perm	c0.45									0.18		
v/c Ratio	0.85	0.82						0.49	0.74		0.25	
Uniform Delay, d1	22.1	21.6						38.0	27.5		26.7	
Progression Factor	0.55	0.53						1.00	1.10		0.99	
Incremental Delay, d2	6.4	2.0						1.8	8.1		0.5	
Delay (s)	18.6	13.5						39.8	38.4		26.9	
Level of Service	B	B						D	D		C	
Approach Delay (s)	14.8		0.0					39.8		32.4		
Approach LOS	B		A					D		C		

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

7050: Queens Quay & Simcoe St.

6/8/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔↔↔			↔	↔↔	
Volume (vph)	56	676	15	53	639	89	10	45	0	121	5	99
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.0	7.0						6.0		6.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.96			1.00		1.00	1.00	
Flpb, ped/bikes	0.92	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98			1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95		1.00	1.00	
Satd. Flow (prot)	1466	1630		1658	1564			1658		1745	1210	825
Flt Permitted	0.32	1.00		0.95	1.00			0.69		1.00	0.73	1.00
Satd. Flow (perm)	497	1630		1658	1564			1204		1745	927	825
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	676	15	53	639	89	10	45	0	121	5	99
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	75	0
Lane Group Flow (vph)	56	691	0	53	724	0	10	45	0	121	29	0
Confl. Peds. (#/hr)	241					241				74	110	
Heavy Vehicles (%)	6%	9%	2%	2%	6%	13%	2%	2%	2%	3%	2%	10%
Turn Type	Perm		Prot			Perm		Perm		Perm		
Protected Phases	2		1			6		8		4		
Permitted Phases	2							8		4		
Actuated Green, G (s)	67.4	67.4	5.6			78.0		30.0		30.0		29.0
Effective Green, g (s)	67.4	67.4	5.6			78.0		30.0		30.0		29.0
Actuated g/C Ratio	0.56	0.56	0.05			0.64		0.25		0.25		0.24
Clearance Time (s)	7.0	7.0	5.0			7.0		6.0		6.0		7.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0		3.0		3.0
Lane Grp Cap (vph)	277	908	77			1008		299		433		198
v/s Ratio Prot	c0.42		0.03			c0.46		0.03		0.03		
v/s Ratio Perm	0.11							0.01		c0.13		
v/c Ratio	0.20	0.76	0.69			0.72		0.03		0.10		0.55
Uniform Delay, d1	13.4	20.6	56.8			14.2		34.5		35.1		40.2
Progression Factor	1.00	1.00	1.00			1.00		1.00		1.00		1.00
Incremental Delay, d2	1.6	6.2	25.1			4.5		0.0		0.1		2.7
Delay (s)	15.0	26.8	81.9			18.7		34.6		35.2		43.0
Level of Service	B	C	F			B		C		D		D
Approach Delay (s)	25.9		23.0			35.1		40.0		40.0		
Approach LOS	C		C			D		D			D	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	121.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

7070: Queens Quay & York St.

6/8/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔		↔	↔	↔	↔	↔
Volume (vph)	86	704	22	11	681	243	39	20	25	56	25	75
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.0	5.0		5.0	7.0	7.0		7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	0.98		1.00	1.00	0.72		0.94		1.00	1.00	0.36
Flpb, ped/bikes	0.93	1.00		1.00	1.00	1.00		0.72		0.85	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (prot)	1518	1594		1243	1695	1057		985		1255	1435	516
Flt Permitted	0.33	1.00		0.95	1.00	1.00		0.86		0.73	1.00	1.00
Satd. Flow (perm)	521	1594		1243	1695	1057		867		968	1435	516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	86	704	22	11	681	243	39	20	25	56	25	75
RTOR Reduction (vph)	0	1	0	0	0	65	0	13	0	0	0	56
Lane Group Flow (vph)	86	725	0	11	681	178	0	71	0	56	25	19
Confl. Peds. (#/hr)	140		344	344		140	435		66	66		435
Heavy Vehicles (%)	4%	9%	10%	36%	5%	3%	5%	5%	36%	14%	24%	5%
Turn Type	Perm			Prot		Perm	Perm			Perm		Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			1		6	8			4		4
Actuated Green, G (s)	73.0	73.0		1.0	79.0	79.0		31.0		31.0	31.0	31.0
Effective Green, g (s)	73.0	75.0		1.0	79.0	79.0		31.0		31.0	31.0	31.0
Actuated g/C Ratio	0.59	0.60		0.01	0.64	0.64		0.25		0.25	0.25	0.25
Clearance Time (s)	7.0	7.0		5.0	7.0	7.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	307	964		10	1080	673		217		242	359	129
v/s Ratio Prot		c0.45		0.01	c0.40						0.02	
v/s Ratio Perm	0.17				0.17		c0.08		0.06			0.04
v/c Ratio	0.28	0.75		1.10	0.63	0.26		0.33		0.23	0.07	0.15
Uniform Delay, d1	12.6	17.8		61.5	13.6	9.8		38.0		37.0	35.5	36.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	5.6		693.7	2.8	1.0		4.0		2.2	0.4	2.4
Delay (s)	14.8	23.4		755.2	16.5	10.8		42.0		39.3	35.9	38.6
Level of Service	B	C		F	B	B		D		D	D	D
Approach Delay (s)		22.5			23.7			42.0			38.4	
Approach LOS		C			C			D			D	

Intersection Summary

HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

7080: Queens Quay & Bay St.

6/8/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔		↔	↔	↔	↔	↔
Volume (vph)	169	761	3	29	675	244	2	10	12	154	107	61
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	0.75		0.83		1.00	0.86	0.86
Flpb, ped/bikes	1.00	1.00		0.91	1.00	1.00		0.98		0.68	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	0.95	0.95
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1510	1676		1516	1728	999		2473		1061	1419	1419
Flt Permitted	0.16	1.00		0.28	1.00	1.00		0.94		0.74	1.00	1.00
Satd. Flow (perm)	258	1676		448	1728	999		2330		827	1419	1419
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	169	761	3	29	675	244	2	10	12	154	107	61
RTOR Reduction (vph)	0	0	0	0	0	79	0	9	0	0	20	0
Lane Group Flow (vph)	169	764	0	29	675	165	0	15	0	154	148	0
Confl. Peds. (#/hr)	210		166	166		210	210		184	184		210
Heavy Vehicles (%)	12%	6%	2%	2%	3%	14%	2%	2%	2%	9%	2%	2%
Turn Type	pm+pt			Perm		Perm	Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		4
Actuated Green, G (s)	60.0	60.0		47.2	47.2	47.2		29.0		29.0	29.0	29.0
Effective Green, g (s)	60.0	60.0		47.2	47.2	47.2		29.0		29.0	29.0	29.0
Actuated g/C Ratio	0.58	0.58		0.46	0.46	0.46		0.28		0.28	0.28	0.28
Clearance Time (s)	5.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	245	976		205	792	458		656		233	400	400
v/s Ratio Prot	0.05	c0.46			c0.39						0.10	
v/s Ratio Perm	0.35			0.06		0.17		0.01		c0.19		
v/c Ratio	0.69	0.78		0.14	0.85	0.36		0.02		0.66	0.37	
Uniform Delay, d1	16.6	16.5		16.2	24.8	18.1		26.8		32.7	29.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	8.2	6.5		1.4	12.5	2.2		0.0		7.1	0.6	
Delay (s)	24.8	23.0		17.6	37.3	20.3		26.8		39.7	30.3	
Level of Service	C	C		B	D	C		C		D	C	
Approach Delay (s)		23.4			32.3			26.8			34.8	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

5070: Lakeshore Blvd. E (WB) & York St.

6/8/2010



Movement	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	SBT	SBR	SBR2
Lane Configurations		↑↑↑	↑↑				↑↑	↑	↑	
Volume (vph)	96	1345	826	146	116	25	651	357	119	506
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0	4.0				6.0	6.0	8.0	
Lane Util. Factor		0.91	0.88				0.95	1.00	1.00	
Frpb, ped/bikes		1.00	0.84				1.00	1.00	0.92	
Flpb, ped/bikes		1.00	1.00				0.99	1.00	1.00	
Frt		1.00	0.85				1.00	1.00	0.85	
Flt Protected		1.00	1.00				0.99	1.00	1.00	
Satd. Flow (prot)		4651	2188				3195	1548	1298	
Flt Permitted		1.00	1.00				0.73	1.00	1.00	
Satd. Flow (perm)		4651	2188				2340	1548	1298	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	96	1345	826	146	116	25	651	357	119	506
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	52	0
Lane Group Flow (vph)	0	1441	960	0	0	0	792	357	573	0
Confl. Peds. (#/hr)	41		63			86			86	
Heavy Vehicles (%)	14%	3%	1%	6%	1%	50%	3%	15%	28%	2%
Turn Type	Perm		Perm		Perm	Perm			Perm	
Protected Phases		6					8	4		
Permitted Phases	6		6		8	8			4	
Actuated Green, G (s)		48.0	48.0				50.0	50.0	50.0	
Effective Green, g (s)		48.0	50.0				52.0	52.0	50.0	
Actuated g/C Ratio		0.43	0.45				0.46	0.46	0.45	
Clearance Time (s)		6.0	6.0				8.0	8.0	8.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0	3.0	
Lane Grp Cap (vph)		1993	977				1086	719	579	
v/s Ratio Prot								0.23		
v/s Ratio Perm		0.31	c0.44				0.34		c0.44	
v/c Ratio		0.72	0.98				0.73	0.50	0.99	
Uniform Delay, d1		26.5	30.6				24.3	20.9	30.7	
Progression Factor		0.37	0.46				0.95	0.70	0.74	
Incremental Delay, d2		1.1	27.3				3.8	2.4	64.9	
Delay (s)		11.1	41.5				26.8	17.0	87.6	
Level of Service		B	D				C	B	F	
Approach Delay (s)		23.3					26.8	61.9		
Approach LOS		C					C	E		

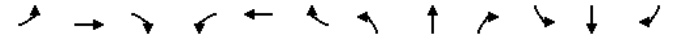
Intersection Summary

HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	135.2%	ICU Level of Service	H
Analysis Period (min)	60		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

6070: Harbour Street & York St.

6/8/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑		↑	↑	
Volume (vph)	424	2133	29	0	0	0	0	310	83	366	136	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0	6.0					8.0		0.0	8.0	
Lane Util. Factor		1.00	0.91					0.95		1.00	1.00	
Frpb, ped/bikes		1.00	1.00					0.99		1.00	1.00	
Flpb, ped/bikes		0.97	1.00					1.00		0.99	1.00	
Frt		1.00	1.00					0.97		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1606	4752					3165		1680	1648	
Flt Permitted		0.95	1.00					1.00		0.45	1.00	
Satd. Flow (perm)		1606	4752					3165		789	1648	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	424	2133	29	0	0	0	0	310	83	366	136	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	424	2161	0	0	0	0	0	378	0	366	136	0
Confl. Peds. (#/hr)	31		48	48		31	451		19	19	451	
Heavy Vehicles (%)	2%	2%	0%	0%	0%	0%	0%	3%	1%	0%	8%	0%
Turn Type	Perm									pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Actuated Green, G (s)		57.0	57.0					22.0		41.0	41.0	
Effective Green, g (s)		57.0	57.0					22.0		45.0	41.0	
Actuated g/C Ratio		0.51	0.51					0.20		0.40	0.37	
Clearance Time (s)		6.0	6.0					8.0		4.0	8.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		817	2418					622		468	603	
v/s Ratio Prot			c0.45					c0.12		c0.13	0.08	
v/s Ratio Perm		0.26								0.18		
v/c Ratio		0.52	0.89					0.61		0.78	0.23	
Uniform Delay, d1		18.4	24.8					41.1		25.7	24.5	
Progression Factor		0.97	0.84					1.00		0.66	0.64	
Incremental Delay, d2		1.8	4.5					4.4		11.8	0.8	
Delay (s)		19.5	25.3					45.5		28.9	16.4	
Level of Service		B	C					D		C	B	
Approach Delay (s)		24.4			0.0			45.5			25.5	
Approach LOS		C			A			D			C	

Intersection Summary

HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	60		
c Critical Lane Group			

Queues

5050: Lakeshore Blvd. E (EB) & Simcoe St.

6/8/2010



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	NER
Lane Group Flow (vph)	212	1303	1306	30	204	527	486	1117
v/c Ratio	0.96	0.97	0.96	0.16	0.45	0.99	0.73	0.65
Control Delay	121.9	57.5	46.9	32.7	31.9	92.3	31.9	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.9	57.5	46.9	32.7	31.9	92.3	31.9	22.3
Queue Length 50th (m)	44.0	150.3	67.6	4.9	31.5	88.5	88.9	75.2
Queue Length 95th (m)	m#82.1	m#208.2	m#151.6	14.4	61.7	#217.5	#161.9	111.8
Internal Link Dist (m)		218.1	12.5		97.1		195.5	
Turn Bay Length (m)								
Base Capacity (vph)	220	1346	1354	191	458	533	666	1724
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	0.96	0.97	0.96	0.16	0.45	0.99	0.73	0.65

Intersection Summary

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

Queue shown is maximum after two cycles.

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

Queues

5070: Lakeshore Blvd. E (WB) & York St.

6/8/2010



Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	1441	972	792	982
v/c Ratio	0.72	0.98	0.94	0.91dr
Control Delay	11.1	40.8	55.1	21.0
Queue Delay	0.1	0.0	191.4	0.1
Total Delay	11.1	40.8	246.6	21.1
Queue Length 50th (m)	48.2	90.3	90.6	84.4
Queue Length 95th (m)	m64.8	m#161.3	#151.1	136.2
Internal Link Dist (m)	69.2		39.0	135.0
Turn Bay Length (m)				
Base Capacity (vph)	1994	988	839	1276
Starvation Cap Reductn	0	0	124	10
Spillback Cap Reductn	32	0	0	10
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.98	1.11	0.78

Intersection Summary

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

Queue shown is maximum after two cycles.

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

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Queues

5080: Lakeshore Blvd. E (WB) & Bay St.

6/8/2010



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	2290	161	561	405	421
v/c Ratio	0.88	0.76	0.41	0.47	0.81
Control Delay	11.7	49.3	20.1	20.7	49.1
Queue Delay	0.0	0.0	0.9	0.0	0.0
Total Delay	11.7	49.3	21.0	20.7	49.1
Queue Length 50th (m)	44.6	31.6	42.3	56.1	39.8
Queue Length 95th (m)	m45.3	m#60.7	m55.8	95.8	#81.0
Internal Link Dist (m)	145.6		40.6	301.1	
Turn Bay Length (m)		30.0			50.0
Base Capacity (vph)	2615	212	1370	856	521
Starvation Cap Reductn	0	0	515	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	0.76	0.66	0.47	0.81

Intersection Summary

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

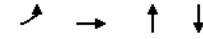
Queue shown is maximum after two cycles.

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

Queues

6070: Harbour Street & York St.

6/8/2010



Lane Group	EBL	EBT	NBT	SBT
Lane Group Flow (vph)	424	2162	393	502
v/c Ratio	0.54	0.93	0.62	0.99dl
Control Delay	19.7	27.8	43.8	21.0
Queue Delay	2.2	0.0	0.4	3.0
Total Delay	21.9	27.8	44.2	24.0
Queue Length 50th (m)	45.3	93.7	39.6	24.7
Queue Length 95th (m)	m60.9	m#202.8	63.5	m42.6
Internal Link Dist (m)		146.3	106.9	39.0
Turn Bay Length (m)				
Base Capacity (vph)	789	2335	638	878
Starvation Cap Reductn	0	0	0	262
Spillback Cap Reductn	228	0	41	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.93	0.66	0.81

Intersection Summary

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

Queue shown is maximum after two cycles.

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

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

Queues

6080: Harbour Street & Bay St.

6/8/2010



Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	749	2049	468	238	262
w/c Ratio	0.85	0.82	0.49	0.70	0.25
Control Delay	19.7	13.6	39.8	39.1	27.1
Queue Delay	0.0	0.1	0.0	9.1	0.0
Total Delay	19.7	13.7	39.8	48.2	27.1
Queue Length 50th (m)	121.6	109.9	32.7	43.0	24.6
Queue Length 95th (m)	m192.3	m144.2	49.6	m#78.2	m38.6
Internal Link Dist (m)		180.7	102.3		24.5
Turn Bay Length (m)				35.0	
Base Capacity (vph)	886	2491	950	340	1043
Starvation Cap Reductn	0	0	0	67	0
Spillback Cap Reductn	0	20	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.85	0.83	0.49	0.87	0.25

Intersection Summary

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

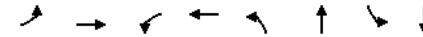
Queue shown is maximum after two cycles.

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

Queues

7050: Queens Quay & Simcoe St.

6/8/2010



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	691	53	728	10	45	121	104
w/c Ratio	0.20	0.75	0.58	0.72	0.03	0.10	0.54	0.38
Control Delay	16.7	27.7	82.2	19.4	34.6	35.6	50.2	12.3
Queue Delay	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0
Total Delay	16.7	27.7	82.2	20.9	34.6	35.6	50.2	12.3
Queue Length 50th (m)	6.5	124.0	12.4	104.4	1.8	8.2	25.0	0.9
Queue Length 95th (m)	17.0	#238.6	#34.6	197.5	7.0	19.8	51.7	21.2
Internal Link Dist (m)		299.9		195.8		36.7		97.1
Turn Bay Length (m)		55.0		50.0				
Base Capacity (vph)	278	916	97	1009	301	436	225	276
Starvation Cap Reductn	0	0	0	126	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 w/c Ratio	0.20	0.75	0.55	0.82	0.03	0.10	0.54	0.38

Intersection Summary

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

Queue shown is maximum after two cycles.

Queues

7070: Queens Quay & York St.

6/8/2010



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	86	726	11	681	243	84	56	25	75
v/c Ratio	0.27	0.73	0.22	0.64	0.33	0.35	0.22	0.07	0.39
Control Delay	15.0	21.9	66.0	17.7	4.2	33.8	38.0	34.4	14.5
Queue Delay	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	23.4	66.0	17.7	4.2	33.8	38.0	34.4	14.5
Queue Length 50th (m)	8.5	103.8	2.6	93.8	5.6	12.8	10.4	4.5	0.0
Queue Length 95th (m)	26.3	#257.0	9.8	164.3	22.7	32.3	24.7	12.9	17.9
Internal Link Dist (m)		195.8		64.1		9.7		106.9	
Turn Bay Length (m)	40.0		40.0		40.0		20.0		
Base Capacity (vph)	314	997	52	1059	735	238	251	371	192
Starvation Cap Reductn	0	118	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.83	0.21	0.64	0.33	0.35	0.22	0.07	0.39

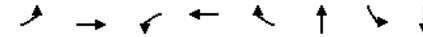
Intersection Summary

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

Queues

7080: Queens Quay & Bay St.

6/8/2010



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	169	764	29	675	244	24	154	168
v/c Ratio	0.68	0.78	0.14	0.85	0.45	0.04	0.66	0.40
Control Delay	25.1	24.0	18.7	38.5	10.6	18.0	49.1	28.2
Queue Delay	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0
Total Delay	25.1	24.0	18.7	40.1	10.6	18.0	49.1	28.2
Queue Length 50th (m)	14.1	109.8	3.3	116.9	11.5	0.8	27.2	22.4
Queue Length 95th (m)	#37.1	#227.9	10.5	#223.2	40.7	4.6	#66.3	47.7
Internal Link Dist (m)		181.9		165.2		30.2		102.3
Turn Bay Length (m)	30.0		30.0		40.0			
Base Capacity (vph)	252	976	205	792	537	664	233	420
Starvation Cap Reductn	0	0	0	31	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	0.67	0.78	0.14	0.89	0.45	0.04	0.66	0.40

Intersection Summary

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

Queues

5070: Lakeshore Blvd. E (WB) & York St.

6/8/2010



Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1441	972	792	357	625
w/c Ratio	0.72	0.98	0.73	0.50	0.99
Control Delay	11.2	43.7	27.4	17.4	82.6
Queue Delay	0.2	0.0	4.9	0.0	0.0
Total Delay	11.4	43.7	32.3	17.4	82.6
Queue Length 50th (m)	60.4	110.3	48.8	26.2	119.3
Queue Length 95th (m)	m74.5	m#169.7	120.3	93.7	#237.1
Internal Link Dist (m)	69.2		39.0	135.0	
Turn Bay Length (m)					
Base Capacity (vph)	1994	988	1086	719	632
Starvation Cap Reductn	0	0	218	0	0
Spillback Cap Reductn	114	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.77	0.98	0.91	0.50	0.99

Intersection Summary

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

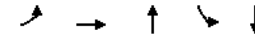
Queue shown is maximum after two cycles.

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

Queues

6070: Harbour Street & York St.

6/8/2010



Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	424	2162	393	366	136
w/c Ratio	0.52	0.89	0.62	0.74	0.23
Control Delay	20.0	25.8	44.0	24.7	16.6
Queue Delay	0.9	0.0	0.0	2.2	1.5
Total Delay	20.9	25.8	44.0	26.9	18.2
Queue Length 50th (m)	47.2	98.0	39.7	29.0	12.0
Queue Length 95th (m)	m64.8	m120.1	63.6	m#53.2	m21.2
Internal Link Dist (m)		146.3	106.9		39.0
Turn Bay Length (m)					
Base Capacity (vph)	817	2419	637	496	603
Starvation Cap Reductn	0	0	0	48	322
Spillback Cap Reductn	171	0	5	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.66	0.89	0.62	0.82	0.48

Intersection Summary

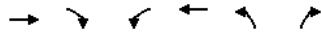
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM Unsignalized Intersection Capacity Analysis  
9674: Harbour Street & N/S Link

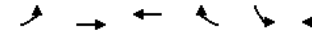
6/8/2010



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑					↑
Volume (veh/h)	2552	30	0	0	0	33
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)	2552	30	0	0	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	86		205			
pX, platoon unblocked			0.61		0.61	0.61
vC, conflicting volume			2582		2567	653
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			410		386	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			700		361	663
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>EB 4</b>	<b>NB 1</b>	
Volume Total	729	729	729	395	33	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	30	33	
cSH	1700	1700	1700	1700	663	
Volume to Capacity	0.43	0.43	0.43	0.23	0.05	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.2	
Control Delay (s)	0.0	0.0	0.0	0.0	10.7	
Lane LOS						B
Approach Delay (s)	0.0		10.7			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay	0.1					
Intersection Capacity Utilization	45.6%		ICU Level of Service			A
Analysis Period (min)	60					

HCM Unsignalized Intersection Capacity Analysis  
9771: Queens Quay & N/S Link

6/8/2010



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	33	732	718	20	184	120
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)	33	732	718	20	184	120
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	88		206			
pX, platoon unblocked	0.64				0.80	0.64
vC, conflicting volume	738				1526	728
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	301				617	285
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				47	75
cM capacity (veh/h)	801				347	479
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>SB 1</b>		
Volume Total	33	732	738	304		
Volume Left	33	0	0	184		
Volume Right	0	0	20	120		
cSH	801	1700	1700	389		
Volume to Capacity	0.04	0.43	0.43	0.78		
Queue Length 95th (m)	1.0	0.0	0.0	67.3		
Control Delay (s)	9.7	0.0	0.0	44.9		
Lane LOS	A			E		
Approach Delay (s)	0.4		0.0	44.9		
Approach LOS				E		
<b>Intersection Summary</b>						
Average Delay	7.7					
Intersection Capacity Utilization	60.4%		ICU Level of Service			B
Analysis Period (min)	60					