Appendix B

2031 and 2041 Future Turning Volumes

2031 AM Peak Hour Volumes

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Ninth Line and Derry	400	535	323	23	556	277	209	1389	178	151	624	44
Ninth Line and Beacham	0	1301	128	88	826	0	0	0	0	119	0	87
Ninth Line and Doug Leavens	17	1256	136	120	828	17	133	13	54	111	5	175
Ninth Line and Foxwood / Street B South	10	1147	36	30	1012	39	29	0	42	46	0	68
Ninth Line and Osprey / Street A	30	1011	112	30	954	8	93	0	93	228	0	117
Ninth Line and Britannia	400	906	154	82	944	143	151	1294	400	100	675	95
Ninth Line and McDowell	0	1368	69	34	1494	0	0	0	0	52	0	46
Ninth Line and Thomas	0	1267	190	142	1396	0	0	0	0	208	0	183
Ninth Line and Tacc	0	1267	75	48	1572	0	0	0	0	48	0	93
Ninth Line and Erin Centre	0	1039	77	108	1646	0	0	0	0	142	0	75
Ninth Line and 5150 Site Access	11	1083	0	0	1784	6	21	0	38	0	0	0
Ninth Line and Eglinton	23	757	137	400	1280	67	37	612	118	99	264	256
Derry West Ramp	0	0	0	54	0	46	0	1923	0	0	904	0
Derry East Ramp	19	0	185	0	0	0	0	1567	0	0	1102	0
Britannia West Ramp	0	0	0	70	0	63	0	1763	0	0	965	0
Britannia East Ramp	69	0	191	0	0	0	0	1648	0	0	1032	0
Ninth Line and Street B North	2	1430	0	0	947	18	20	0	8	0	0	0
Ninth Line and Street C	9	1304	0	0	982	16	42	0	15	0	0	0

2031 PM Peak Hour Volumes

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Ninth Line and Derry	260	658	200	56	560	315	199	813	400	230	1737	45
Ninth Line and Beacham	0	1028	87	51	1215	0	0	0	0	111	0	54
Ninth Line and Doug Leavens	52	982	110	157	1224	53	79	8	32	147	13	106
Ninth Line and Foxwood / Street B South	32	1253	60	42	1245	120	18	0	25	22	0	17
Ninth Line and Osprey / Street A	92	1246	183	40	1220	24	55	0	55	270	0	32
Ninth Line and Britannia	400	1077	83	83	1029	340	277	695	469	92	1236	101
Ninth Line and McDowell	0	1653	205	25	1411	0	0	0	0	94	0	43
Ninth Line and Thomas	0	1680	162	213	1281	0	0	0	0	167	0	277
Ninth Line and Tacc	0	1751	71	56	1425	0	0	0	0	97	0	92
Ninth Line and Erin Centre	0	1680	106	143	1322	0	0	0	0	114	0	158
Ninth Line and 5150 Site Access	38	1793	0	0	1417	20	12	0	22	0	0	0
Ninth Line and Eglinton	103	1218	192	374	975	49	54	554	54	133	694	537
Derry West Ramp	0	0	0	361	0	180	0	1265	0	0	2214	0
Derry East Ramp	67	0	392	0	0	0	0	1157	0	0	2247	0
Britannia West Ramp	0	0	0	164	0	173	0	1412	0	0	1888	0
Britannia East Ramp	123	0	118	0	0	0	0	1419	0	0	1882	0
Ninth Line and Street B North	8	1102	0	0	1353	57	12	0	5	0	0	0
Ninth Line and Street C	28	1181	0	0	1360	48	25	0	15	0	0	0

2041 AM Peak Hour Volumes

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Ninth Line and Derry	400	858	241	23	656	391	400	1469	201	122	581	44
Ninth Line and Beacham	0	1423	128	90	946	0	0	0	0	130	0	95
Ninth Line and Doug Leavens	17	1376	136	136	934	17	133	13	54	111	5	189
Ninth Line and Foxwood / Street B South	10	1240	36	30	1116	39	29	0	42	46	0	68
Ninth Line and Osprey / Street A	30	1135	119	30	1065	8	93	0	93	232	0	86
Ninth Line and Britannia	400	984	154	83	1001	168	227	1337	400	100	681	113
Ninth Line and McDowell	0	1406	81	26	1589	0	0	0	0	91	0	46
Ninth Line and Thomas	0	1360	193	142	1522	0	0	0	0	208	0	183
Ninth Line and Tacc	0	1373	75	65	1639	0	0	0	0	48	0	106
Ninth Line and Erin Centre	0	1115	77	110	1685	0	0	0	0	145	0	82
Ninth Line and 5150 Site Access	11	1161	0	0	1821	6	21	0	38	0	0	0
Ninth Line and Eglinton	28	856	150	400	1316	70	38	612	123	99	264	256
Derry West Ramp	0	0	0	54	0	46	0	2270	0	0	1010	0
Derry East Ramp	54	0	242	0	0	0	0	1769	0	0	1173	0
Britannia West Ramp	0	0	0	70	0	63	0	1993	0	0	996	0
Britannia East Ramp	69	0	208	0	0	0	0	1807	0	0	1063	0
Ninth Line and Street B North	2	1558	0	0	1073	18	20	0	8	0	0	0
Ninth Line and Street C	9	1401	0	0	1079	16	42	0	15	0	0	0

2031 AM Peak Hour Volumes

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Ninth Line and Derry	246	831	140	56	761	400	367	722	400	165	1608	45
Ninth Line and Beacham	0	1082	110	81	1357	0	0	0	0	131	0	80
Ninth Line and Doug Leavens	52	1059	110	157	1404	53	79	8	32	147	13	106
Ninth Line and Foxwood / Street B South	32	1312	61	43	1334	120	18	0	25	22	0	17
Ninth Line and Osprey / Street A	92	1305	183	45	1308	24	55	0	55	270	0	32
Ninth Line and Britannia	400	1113	83	90	1061	369	288	729	400	92	1299	101
Ninth Line and McDowell	0	1697	205	26	1441	0	0	0	0	117	0	59
Ninth Line and Thomas	0	1680	162	237	1313	0	0	0	0	178	0	322
Ninth Line and Tacc	0	1751	75	65	1460	0	0	0	0	97	0	94
Ninth Line and Erin Centre	0	1688	125	143	1361	0	0	0	0	132	0	158
Ninth Line and 5150 Site Access	38	1819	0	0	1475	20	12	0	22	0	0	0
Ninth Line and Eglinton	110	1244	208	374	1042	49	54	562	60	154	728	538
Derry West Ramp	0	0	0	361	0	219	0	1330	0	0	2156	0
Derry East Ramp	67	0	498	0	0	0	0	1157	0	0	2189	0
Britannia West Ramp	0	0	0	164	0	224	0	1451	0	0	2054	0
Britannia East Ramp	197	0	118	0	0	0	0	1439	0	0	1974	0
Ninth Line and Street B North	8	1179	0	0	1515	57	12	0	5	0	0	0
Ninth Line and Street C	28	1237	0	0	1457	48	25	0	15	0	0	0

Appendix C

2031 Signal Warrants

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / Beacham

Count Date: 2031

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	59	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	96	%		
3. Combination	A	Justificaton 1	59	%	☐	☑
	B	Justification 2	96	%		
4. 4-Hr Volume			100	%	☑	☐
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Input Sheet | Analysis Sheet | Proposed Collision

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / Tacc

Count Date: 2031

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100 %	☐	☑
	B	Crossing Volume	55 %		
2. Delay to Cross Traffic	A	Main Road	100 %	☐	☑
	B	Crossing Road	70 %		
3. Combination	A	Justificaton 1	55 %	☐	☑
	B	Justification 2	70 %		
4. 4-Hr Volume			100 %	☑	☐
5. Collision Experience			7 %	☐	☑
6. Pedestrians	A	Volume	Justification not met	☐	☑
	B	Delay	Justification not met		

Input Sheet | Analysis Sheet | Proposed Collision

Appendix C

2041 Signal Warrants

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / Beacham

Count Date: 2041

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100 %	☐	☑
	B	Crossing Volume	70 %		
2. Delay to Cross Traffic	A	Main Road	100 %	☐	☑
	B	Crossing Road	98 %		
3. Combination	A	Justificaton 1	70 %	☐	☑
	B	Justification 2	98 %		
4. 4-Hr Volume			100 %	☑	☐
5. Collision Experience			0 %	☐	☑
6. Pedestrians	A	Volume	Justification not met	☐	☑
	B	Delay	Justification not met		

Input Sheet | Analysis Sheet | Proposed Collision

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / Street B North

Count Date: 2041

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	7	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	17	%		
3. Combination	A	Justificaton 1	7	%	☐	☑
	B	Justification 2	17	%		
4. 4-Hr Volume			18	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Input Sheet | Analysis Sheet | Proposed Collision

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / Street C

Count Date: 2041

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	17	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	41	%		
3. Combination	A	Justificaton 1	17	%	☐	☑
	B	Justification 2	41	%		
4. 4-Hr Volume			43	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Input Sheet | Analysis Sheet | Proposed Collision

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / Foxwood

Count Date: 2041

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	78	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	82	%		
3. Combination	A	Justificaton 1	78	%	☐	☑
	B	Justification 2	82	%		
4. 4-Hr Volume			64	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Input Sheet | Analysis Sheet | Proposed Collision

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / McDowell

Count Date: 2041

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100 %	☐	☑
	B	Crossing Volume	47 %		
2. Delay to Cross Traffic	A	Main Road	100 %	☐	☑
	B	Crossing Road	87 %		
3. Combination	A	Justificaton 1	47 %	☐	☑
	B	Justification 2	87 %		
4. 4-Hr Volume			98 %	☐	☑
5. Collision Experience			20 %	☐	☑
6. Pedestrians	A	Volume	Justification not met	☐	☑
	B	Delay	Justification not met		

Input Sheet | Analysis Sheet | Proposed Collision

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / Tacc

Count Date: 2041

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	57	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	70	%		
3. Combination	A	Justificaton 1	57	%	☐	☑
	B	Justification 2	70	%		
4. 4-Hr Volume			100	%	☑	☐
5. Collision Experience			7	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Ninth Line / Site Access

Count Date: 2041

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	14	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	17	%		
3. Combination	A	Justificaton 1	14	%	☐	☑
	B	Justification 2	17	%		
4. 4-Hr Volume			36	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

Input Sheet | Analysis Sheet | Proposed Collision

Appendix D

Traffic Methodology

INTERSECTION LEVEL OF SERVICE

Traffic operations for weekday AM and PM peak hours were assessed for all signalized intersections along the study corridor.

The signalized intersection analysis considers two separate measures of performance:

- The capacity of all intersection movements, which is based on a volume to capacity ratio (v/c); and
- The level of service (LOS) for all intersection movements, which is based on the average control delay per vehicle for each of various movements through the intersection, and for the overall intersection.

Level of service is based on the average control delay per vehicle for a given movement. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a level of service grade between 'A' and 'F', with 'F' being the longest delay. Level of service is based on the scale shown in **Table 1**. The volume to capacity (v/c) ratio is a measure of the degree of capacity utilized at an intersection over the 1-hour analysis time period.

Table 1. Highway Capacity Manual Level of Service Definitions for Intersections

Level of Service (LOS)	Signalized Control Delay per Vehicle (s)	Unsignalized Control Delay per Vehicle (s)	LOS Recommendations
A	≤ 10	≤ 10	Ideal
B	> 10 and ≤ 20	> 10 and ≤ 15	Acceptable
C	> 20 and ≤ 35	> 15 and ≤ 25	Acceptable
D	> 35 and ≤ 55	> 25 and ≤ 35	Somewhat undesirable
E	> 55 and ≤ 80	> 35 and ≤ 50	Undesirable
F	> 80	> 50	Unacceptable

Appendix E

Your Homes Analysis

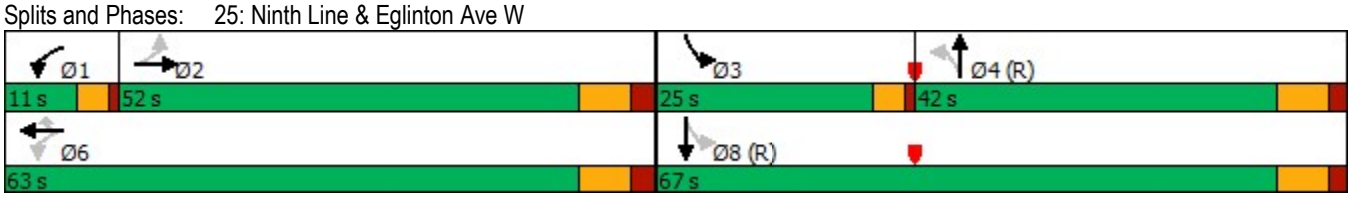
Appendix E

Your Homes Analysis – Case A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	38	612	99	264	256	28	856	400	1316
Future Volume (vph)	38	612	99	264	256	28	856	400	1316
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2	1	6			4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	4	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.0	32.5	32.5	40.0	40.0	11.0	40.0
Total Split (s)	52.0	52.0	11.0	63.0	63.0	42.0	42.0	25.0	67.0
Total Split (%)	40.0%	40.0%	8.5%	48.5%	48.5%	32.3%	32.3%	19.2%	51.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	44.5	44.5	59.0	55.5	55.5	35.0	35.0	63.0	60.0
Actuated g/C Ratio	0.34	0.34	0.45	0.43	0.43	0.27	0.27	0.48	0.46
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.5	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.5	30.1
LOS	C	F	D	C	A	F	F	F	C
Approach Delay		122.8		19.4			99.8		54.8
Approach LOS		F		B			F		D

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 13 (10%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 73.1	Intersection LOS: E
Intersection Capacity Utilization 114.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	735	99	264	256	28	1006	400	1386
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.5	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.5	30.1
Queue Length 50th (m)	6.1	~204.5	13.3	40.9	0.0	6.2	~138.3	~96.3	121.8
Queue Length 95th (m)	13.8	#273.2	#29.2	60.5	14.3	#24.4	#176.8	#160.3	136.0
Internal Link Dist (m)		373.3		388.7			291.0		159.5
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	358	633	153	796	778	34	930	337	1642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	121
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	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.91

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.

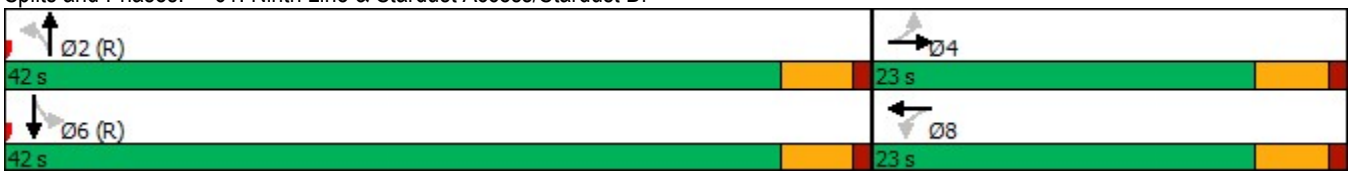
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Future Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1834		1733	1865	1479	1069	3416		1716	3555	
Flt Permitted	0.60	1.00		0.08	1.00	1.00	0.11	1.00		0.10	1.00	
Satd. Flow (perm)	1047	1834		150	1865	1479	129	3416		185	3555	
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)	38	612	123	99	264	256	28	856	150	400	1316	70
RTOR Reduction (vph)	0	5	0	0	0	147	0	11	0	0	3	0
Lane Group Flow (vph)	38	730	0	99	264	109	28	995	0	400	1383	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Effective Green, g (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Actuated g/C Ratio	0.34	0.34		0.43	0.43	0.43	0.27	0.27		0.46	0.46	
Clearance Time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	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)	358	627		149	796	631	34	919		332	1640	
v/s Ratio Prot		c0.40		c0.04	0.14			0.29		c0.19	0.39	
v/s Ratio Perm	0.04			0.25		0.07	0.22			c0.36		
v/c Ratio	0.11	1.16		0.66	0.33	0.17	0.82	1.08		1.20	0.84	
Uniform Delay, d1	29.2	42.8		30.7	24.9	23.1	44.6	47.5		40.7	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.13	0.78	
Incremental Delay, d2	0.6	90.4		10.6	1.1	0.6	105.9	54.7		110.6	3.9	
Delay (s)	29.8	133.1		41.3	26.0	23.6	150.5	102.2		156.4	28.1	
Level of Service	C	F		D	C	C	F	F		F	C	
Approach Delay (s)		128.0			27.5			103.5			56.8	
Approach LOS		F			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	77.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	5	5	5	67	1081	5	1720
Future Volume (vph)	93	5	5	5	67	1081	5	1720
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0	23.0	23.0	42.0	42.0	42.0	42.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	64.6%	64.6%	64.6%	64.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.9	11.9	11.9	11.9	44.1	44.1	44.1	44.1
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.68	0.68	0.68	0.68
v/c Ratio	0.38	0.59	0.03	0.10	0.59	0.46	0.02	0.74
Control Delay	26.3	28.9	19.4	10.4	37.4	11.8	5.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	26.3	28.9	19.4	10.4	37.4	11.8	5.8	7.5
LOS	C	C	B	B	D	B	A	A
Approach Delay		28.0		11.7		13.3		7.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 61: Ninth Line & Stardust Access/Stardust Dr



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	178	5	30	67	1087	5	1753
v/c Ratio	0.38	0.59	0.03	0.10	0.59	0.46	0.02	0.74
Control Delay	26.3	28.9	19.4	10.4	37.4	11.8	5.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	26.3	28.9	19.4	10.4	37.4	11.8	5.8	7.5
Queue Length 50th (m)	9.2	16.2	0.5	0.5	10.1	74.2	0.1	27.7
Queue Length 95th (m)	18.0	29.0	2.4	5.3	m13.5	m79.0	m0.4	51.2
Internal Link Dist (m)		165.6		142.5		159.5		258.5
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	386	461	300	476	113	2373	289	2369
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	57
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.39	0.02	0.06	0.59	0.46	0.02	0.76

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	5	173	5	5	25	67	1081	6	5	1720	33
Future Volume (vph)	93	5	173	5	5	25	67	1081	6	5	1720	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.88		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1574		1750	1612		1750	3497		1750	3490	
Flt Permitted	0.74	1.00		0.57	1.00		0.09	1.00		0.23	1.00	
Satd. Flow (perm)	1359	1574		1056	1612		167	3497		427	3490	
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)	93	5	173	5	5	25	67	1081	6	5	1720	33
RTOR Reduction (vph)	0	16	0	0	20	0	0	0	0	0	2	0
Lane Group Flow (vph)	93	162	0	5	10	0	67	1087	0	5	1751	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.9	11.9		11.9	11.9		44.1	44.1		44.1	44.1	
Effective Green, g (s)	11.9	11.9		11.9	11.9		44.1	44.1		44.1	44.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.68	0.68		0.68	0.68	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	248	288		193	295		113	2372		289	2367	
v/s Ratio Prot		c0.10			0.01			0.31			c0.50	
v/s Ratio Perm	0.07			0.00			0.40			0.01		
v/c Ratio	0.38	0.56		0.03	0.03		0.59	0.46		0.02	0.74	
Uniform Delay, d1	23.3	24.2		21.8	21.8		5.6	4.9		3.4	6.7	
Progression Factor	1.00	1.00		1.00	1.00		3.02	2.14		1.15	0.69	
Incremental Delay, d2	1.0	2.5		0.1	0.0		9.9	0.3		0.1	1.7	
Delay (s)	24.2	26.7		21.8	21.9		26.9	10.7		4.0	6.3	
Level of Service	C	C		C	C		C	B		A	A	
Approach Delay (s)		25.9			21.9			11.7			6.3	
Approach LOS		C			C			B			A	

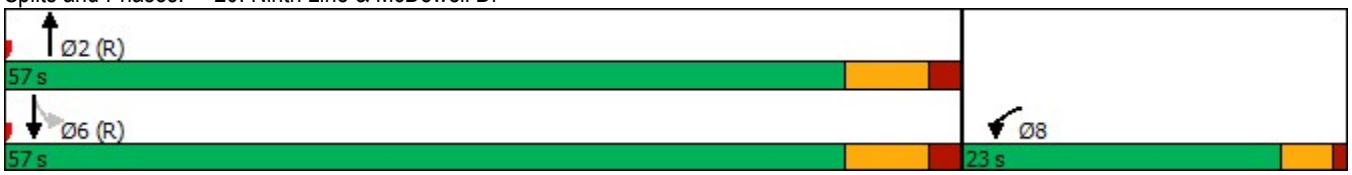
Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	117	1697	26	1441
Future Volume (vph)	117	1697	26	1441
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	57.0	57.0	57.0
Total Split (%)	28.8%	71.3%	71.3%	71.3%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.1	56.9	56.9	56.9
Actuated g/C Ratio	0.15	0.71	0.71	0.71
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	14.7	7.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	14.7	7.2
LOS	C	B	B	A
Approach Delay	34.9	10.7		7.4
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 19 (24%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 20: Ninth Line & McDowell Dr



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	176	1902	26	1441
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	14.7	7.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	14.7	7.2
Queue Length 50th (m)	19.5	71.7	1.1	42.2
Queue Length 95th (m)	34.3	125.0	7.2	71.5
Internal Link Dist (m)	322.0	187.3		341.1
Turn Bay Length (m)			25.0	
Base Capacity (vph)	438	2484	94	2545
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.77	0.28	0.57

Intersection Summary

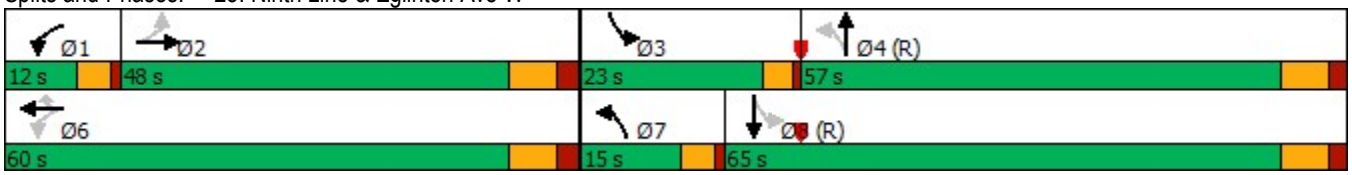
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	117	59	1697	205	26	1441
Future Volume (vph)	117	59	1697	205	26	1441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.98		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1757		3480		1785	3579
Flt Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1757		3480		133	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	59	1697	205	26	1441
RTOR Reduction (vph)	24	0	9	0	0	0
Lane Group Flow (vph)	152	0	1893	0	26	1441
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	12.1		56.9		56.9	56.9
Effective Green, g (s)	12.1		56.9		56.9	56.9
Actuated g/C Ratio	0.15		0.71		0.71	0.71
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	265		2475		94	2545
v/s Ratio Prot	c0.09		c0.54			0.40
v/s Ratio Perm					0.20	
v/c Ratio	0.57		0.76		0.28	0.57
Uniform Delay, d1	31.6		7.3		4.2	5.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	3.0		2.3		7.2	0.9
Delay (s)	34.6		9.6		11.3	6.5
Level of Service	C		A		B	A
Approach Delay (s)	34.6		9.6			6.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	54	562	154	728	538	110	1244	374	1042
Future Volume (vph)	54	562	154	728	538	110	1244	374	1042
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases		2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	11.0	40.0
Total Split (s)	48.0	48.0	12.0	60.0	60.0	15.0	57.0	23.0	65.0
Total Split (%)	34.3%	34.3%	8.6%	42.9%	42.9%	10.7%	40.7%	16.4%	46.4%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	40.5	40.5	55.5	52.5	52.5	62.9	50.0	76.0	58.1
Actuated g/C Ratio	0.29	0.29	0.40	0.38	0.38	0.45	0.36	0.54	0.42
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	191.5	39.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	191.5	41.0
LOS	F	F	F	F	C	E	F	F	D
Approach Delay		135.9		68.0			124.3		79.5
Approach LOS		F		E			F		E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 20 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 97.4	Intersection LOS: F
Intersection Capacity Utilization 128.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	622	154	728	538	110	1452	374	1091
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	191.5	39.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	191.5	41.0
Queue Length 50th (m)	~15.3	~185.5	~27.1	~200.2	66.6	13.9	~232.4	~104.2	125.2
Queue Length 95th (m)	#41.7	#252.6	#69.0	#268.9	110.6	#40.9	#272.2	#163.1	166.7
Internal Link Dist (m)		373.3		388.7			291.0		162.3
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	50	542	148	699	712	139	1231	287	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	230
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	1.08	1.15	1.04	1.04	0.76	0.79	1.18	1.30	0.87

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.

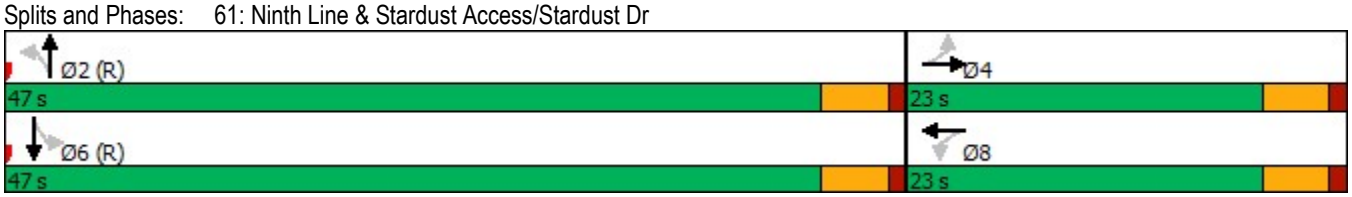
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Future Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1863		1733	1865	1479	1069	3418		1716	3558	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.14	1.00		0.07	1.00	
Satd. Flow (perm)	173	1863		162	1865	1479	157	3418		134	3558	
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)	54	562	60	154	728	538	110	1244	208	374	1042	49
RTOR Reduction (vph)	0	3	0	0	0	158	0	10	0	0	2	0
Lane Group Flow (vph)	54	619	0	154	728	381	110	1442	0	374	1089	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Effective Green, g (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Actuated g/C Ratio	0.29	0.29		0.38	0.38	0.38	0.43	0.36		0.52	0.42	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	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)	50	538		144	699	554	135	1220		284	1476	
v/s Ratio Prot		c0.33		0.06	c0.39		0.06	0.42		c0.18	0.31	
v/s Ratio Perm	0.31			0.34		0.26	0.29			c0.51		
v/c Ratio	1.08	1.15		1.07	1.04	0.69	0.81	1.18		1.32	0.74	
Uniform Delay, d1	49.8	49.8		37.8	43.8	36.8	28.3	45.0		46.2	34.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.04	
Incremental Delay, d2	151.5	87.7		94.7	45.3	3.5	30.0	90.7		162.6	2.9	
Delay (s)	201.2	137.4		132.6	89.1	40.4	58.3	135.7		208.9	38.9	
Level of Service	F	F		F	F	D	E	F		F	D	
Approach Delay (s)		142.5			75.3			130.2			82.3	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	102.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	128.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	33	5	5	182	1739	3	1377
Future Volume (vph)	33	5	5	182	1739	3	1377
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA
Protected Phases		4	8		2		6
Permitted Phases	4			2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0	23.0	47.0	47.0	47.0	47.0
Total Split (%)	32.9%	32.9%	32.9%	67.1%	67.1%	67.1%	67.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.6	8.6	8.6	55.3	55.3	55.3	55.3
Actuated g/C Ratio	0.12	0.12	0.12	0.79	0.79	0.79	0.79
v/c Ratio	0.19	0.49	0.03	0.82	0.63	0.02	0.54
Control Delay	28.7	23.6	22.3	29.8	11.6	5.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	23.6	22.3	29.8	11.6	5.7	6.0
LOS	C	C	C	C	B	A	A
Approach Delay		24.8	22.3		13.4		6.0
Approach LOS		C	C		B		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 72.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 61: Ninth Line & Stardust Access/Stardust Dr



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	117	7	182	1744	3	1473
v/c Ratio	0.19	0.49	0.03	0.82	0.63	0.02	0.54
Control Delay	28.7	23.6	22.3	29.8	11.6	5.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	23.6	22.3	29.8	11.6	5.7	6.0
Queue Length 50th (m)	3.7	7.4	0.6	27.4	149.3	0.1	57.0
Queue Length 95th (m)	9.7	18.9	3.3	m31.5	m133.9	m0.3	61.8
Internal Link Dist (m)		132.6	141.9		162.3		262.7
Turn Bay Length (m)				15.0		15.0	
Base Capacity (vph)	366	455	467	221	2763	150	2739
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	2	0	0	0	0	45
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.26	0.01	0.82	0.63	0.02	0.55

Intersection Summary

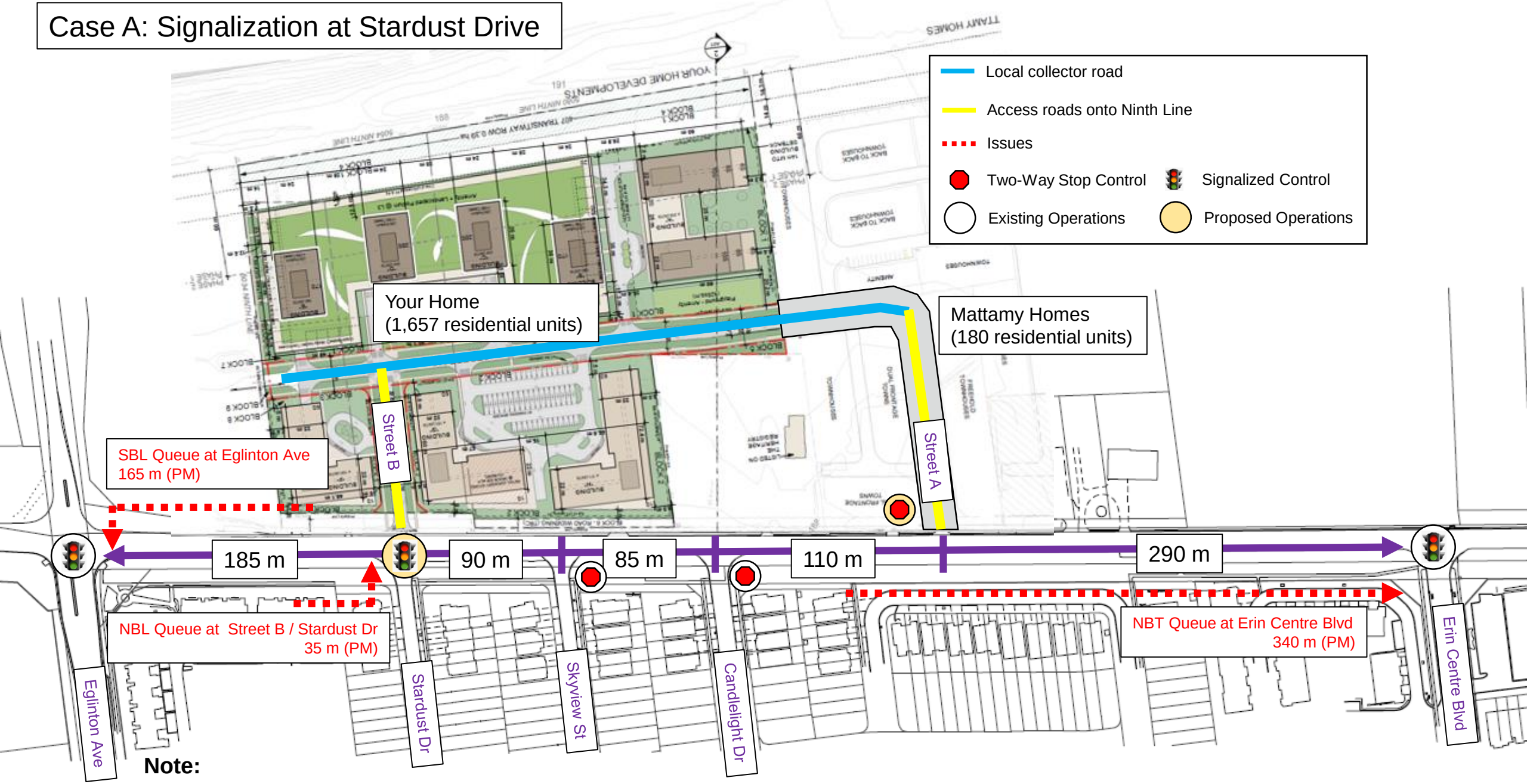
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	5	112	0	5	2	182	1739	5	3	1377	96
Future Volume (vph)	33	5	112	0	5	2	182	1739	5	3	1377	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.86			0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1578			1763		1750	3498		1750	3466	
Flt Permitted	0.75	1.00			1.00		0.15	1.00		0.10	1.00	
Satd. Flow (perm)	1387	1578			1763		279	3498		190	3466	
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)	33	5	112	0	5	2	182	1739	5	3	1377	96
RTOR Reduction (vph)	0	46	0	0	2	0	0	0	0	0	4	0
Lane Group Flow (vph)	33	71	0	0	5	0	182	1744	0	3	1469	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.5	7.5			7.5		53.5	53.5		53.5	53.5	
Effective Green, g (s)	7.5	7.5			7.5		53.5	53.5		53.5	53.5	
Actuated g/C Ratio	0.11	0.11			0.11		0.76	0.76		0.76	0.76	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	148	169			188		213	2673		145	2649	
v/s Ratio Prot		c0.04			0.00			0.50			0.42	
v/s Ratio Perm	0.02						c0.65			0.02		
v/c Ratio	0.22	0.42			0.03		0.85	0.65		0.02	0.55	
Uniform Delay, d1	28.6	29.2			28.0		5.6	3.9		2.0	3.4	
Progression Factor	1.00	1.00			1.00		3.28	2.58		1.70	1.41	
Incremental Delay, d2	0.8	1.7			0.1		4.2	0.1		0.2	0.7	
Delay (s)	29.4	30.9			28.0		22.6	10.1		3.6	5.5	
Level of Service	C	C			C		C	B		A	A	
Approach Delay (s)		30.5			28.0			11.3			5.5	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Case A: Signalization at Stardust Drive



Note:

- All queuing / storage values rounded up.
- Intersection spacing is ‘middle-of-intersection’ to ‘middle-of-intersection’

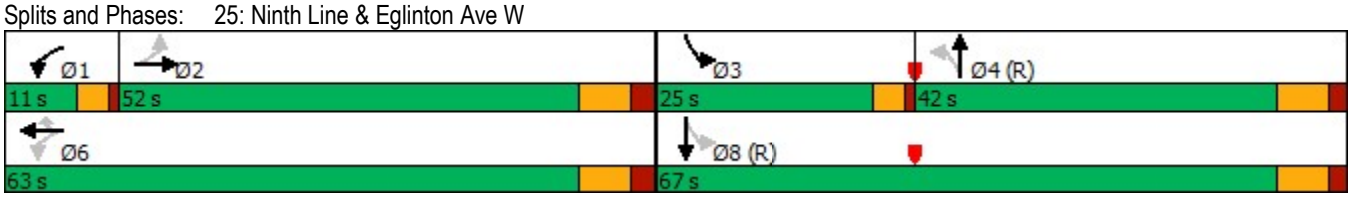
Appendix E

Your Homes Analysis – Case B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	38	612	99	264	256	28	856	400	1316
Future Volume (vph)	38	612	99	264	256	28	856	400	1316
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2	1	6			4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	4	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.0	32.5	32.5	40.0	40.0	11.0	40.0
Total Split (s)	52.0	52.0	11.0	63.0	63.0	42.0	42.0	25.0	67.0
Total Split (%)	40.0%	40.0%	8.5%	48.5%	48.5%	32.3%	32.3%	19.2%	51.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	44.5	44.5	59.0	55.5	55.5	35.0	35.0	63.0	60.0
Actuated g/C Ratio	0.34	0.34	0.45	0.43	0.43	0.27	0.27	0.48	0.46
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	139.0	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	139.0	34.3
LOS	C	F	D	C	A	F	F	F	C
Approach Delay		122.8		19.4			99.8		57.8
Approach LOS		F		B			F		E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 50 (38%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 74.4	Intersection LOS: E
Intersection Capacity Utilization 114.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	735	99	264	256	28	1006	400	1386
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	139.0	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	139.0	34.3
Queue Length 50th (m)	6.1	~204.5	13.3	40.9	0.0	6.2	~138.3	~100.7	136.0
Queue Length 95th (m)	13.8	#273.2	#29.2	60.5	14.3	#24.4	#176.8	#157.2	169.9
Internal Link Dist (m)		373.3		388.7			291.0		251.0
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	358	633	153	796	778	34	930	337	1642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84

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.

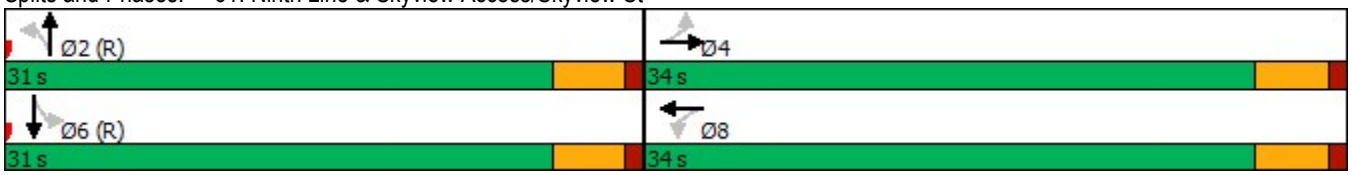
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Future Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1834		1733	1865	1479	1069	3416		1716	3555	
Flt Permitted	0.60	1.00		0.08	1.00	1.00	0.11	1.00		0.10	1.00	
Satd. Flow (perm)	1047	1834		150	1865	1479	129	3416		185	3555	
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)	38	612	123	99	264	256	28	856	150	400	1316	70
RTOR Reduction (vph)	0	5	0	0	0	147	0	11	0	0	3	0
Lane Group Flow (vph)	38	730	0	99	264	109	28	995	0	400	1383	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Effective Green, g (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Actuated g/C Ratio	0.34	0.34		0.43	0.43	0.43	0.27	0.27		0.46	0.46	
Clearance Time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	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)	358	627		149	796	631	34	919		332	1640	
v/s Ratio Prot		c0.40		c0.04	0.14			0.29		c0.19	0.39	
v/s Ratio Perm	0.04			0.25		0.07	0.22			c0.36		
v/c Ratio	0.11	1.16		0.66	0.33	0.17	0.82	1.08		1.20	0.84	
Uniform Delay, d1	29.2	42.8		30.7	24.9	23.1	44.6	47.5		40.7	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.06	0.97	
Incremental Delay, d2	0.6	90.4		10.6	1.1	0.6	105.9	54.7		110.7	3.9	
Delay (s)	29.8	133.1		41.3	26.0	23.6	150.5	102.2		153.9	33.9	
Level of Service	C	F		D	C	C	F	F		F	C	
Approach Delay (s)		128.0			27.5			103.5			60.8	
Approach LOS		F			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	78.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	5	5	5	67	1081	2	1718
Future Volume (vph)	93	5	5	5	67	1081	2	1718
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	34.0	34.0	34.0	34.0	31.0	31.0	31.0	31.0
Total Split (%)	52.3%	52.3%	52.3%	52.3%	47.7%	47.7%	47.7%	47.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.7	12.7	12.7	12.7	43.3	43.3	43.3	43.3
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.67	0.67	0.67	0.67
v/c Ratio	0.35	0.58	0.02	0.05	0.60	0.46	0.01	0.75
Control Delay	24.8	30.1	18.6	12.3	31.9	6.3	2.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	30.1	18.6	12.3	31.9	6.3	2.0	5.2
LOS	C	C	B	B	C	A	A	A
Approach Delay		28.2		13.7		7.8		5.2
Approach LOS		C		B		A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 1 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 61: Ninth Line & Skyview Access/Skyview St



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	178	5	17	67	1083	2	1751
v/c Ratio	0.35	0.58	0.02	0.05	0.60	0.46	0.01	0.75
Control Delay	24.8	30.1	18.6	12.3	31.9	6.3	2.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	30.1	18.6	12.3	31.9	6.3	2.0	5.2
Queue Length 50th (m)	9.0	17.7	0.5	0.5	6.1	33.6	0.0	12.4
Queue Length 95th (m)	17.5	30.0	2.4	3.9	m9.4	m42.0	m0.0	#17.1
Internal Link Dist (m)		103.3		105.5		251.0		311.6
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	623	715	486	754	112	2333	282	2327
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.25	0.01	0.02	0.60	0.46	0.01	0.75

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	5	173	5	5	12	67	1081	2	2	1718	33
Future Volume (vph)	93	5	173	5	5	12	67	1081	2	2	1718	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1574		1750	1647		1750	3499		1750	3490	
Flt Permitted	0.75	1.00		0.58	1.00		0.09	1.00		0.23	1.00	
Satd. Flow (perm)	1375	1574		1072	1647		170	3499		424	3490	
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)	93	5	173	5	5	12	67	1081	2	2	1718	33
RTOR Reduction (vph)	0	2	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	93	176	0	5	7	0	67	1083	0	2	1750	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.7	12.7		12.7	12.7		43.3	43.3		43.3	43.3	
Effective Green, g (s)	12.7	12.7		12.7	12.7		43.3	43.3		43.3	43.3	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.67	0.67		0.67	0.67	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	268	307		209	321		113	2330		282	2324	
v/s Ratio Prot		c0.11			0.00			0.31			c0.50	
v/s Ratio Perm	0.07			0.00			0.39			0.00		
v/c Ratio	0.35	0.57		0.02	0.02		0.59	0.46		0.01	0.75	
Uniform Delay, d1	22.6	23.7		21.1	21.1		6.0	5.2		3.6	7.3	
Progression Factor	1.00	1.00		1.00	1.00		2.14	1.04		0.38	0.32	
Incremental Delay, d2	0.8	2.6		0.0	0.0		9.8	0.3		0.0	1.8	
Delay (s)	23.4	26.3		21.2	21.2		22.7	5.8		1.4	4.2	
Level of Service	C	C		C	C		C	A		A	A	
Approach Delay (s)		25.3			21.2			6.7			4.2	
Approach LOS		C			C			A			A	

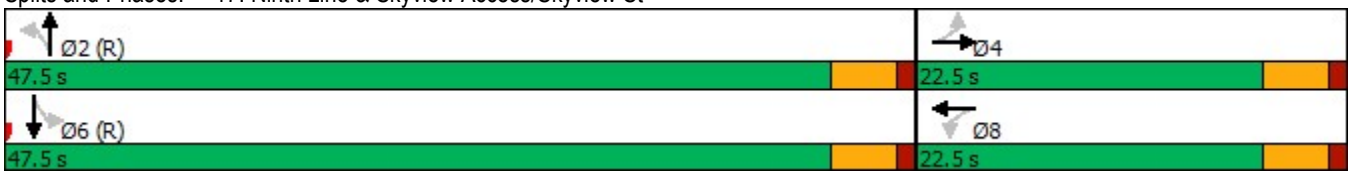
Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	63	5	4	5	182	1724	14	1377
Future Volume (vph)	63	5	4	5	182	1724	14	1377
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	47.5	47.5	47.5	47.5
Total Split (%)	32.1%	32.1%	32.1%	32.1%	67.9%	67.9%	67.9%	67.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.8	8.8	8.8	8.8	55.1	55.1	55.1	55.1
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.79	0.79	0.79	0.79
v/c Ratio	0.36	0.48	0.03	0.04	0.83	0.63	0.09	0.54
Control Delay	33.0	22.8	25.0	20.6	23.8	5.6	3.4	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	22.8	25.0	20.6	23.8	5.6	3.4	3.4
LOS	C	C	C	C	C	A	A	A
Approach Delay		26.4		21.9		7.4		3.4
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 28 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 73.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Ninth Line & Skyview Access/Skyview St



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	63	117	4	9	182	1729	14	1473
v/c Ratio	0.36	0.48	0.03	0.04	0.83	0.63	0.09	0.54
Control Delay	33.0	22.8	25.0	20.6	23.8	5.6	3.4	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	22.8	25.0	20.6	23.8	5.6	3.4	3.4
Queue Length 50th (m)	7.1	7.1	0.4	0.6	26.9	68.1	0.4	23.0
Queue Length 95th (m)	15.7	18.6	2.5	3.7	m28.1	m62.4	m0.8	45.6
Internal Link Dist (m)		126.1		123.3		251.3		300.0
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	356	445	322	445	219	2756	152	2732
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	0.18	0.26	0.01	0.02	0.83	0.63	0.09	0.54

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	5	112	4	5	4	182	1724	5	14	1377	96
Future Volume (vph)	63	5	112	4	5	4	182	1724	5	14	1377	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.86		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1578		1750	1719		1750	3498		1750	3466	
Flt Permitted	0.75	1.00		0.68	1.00		0.15	1.00		0.10	1.00	
Satd. Flow (perm)	1385	1578		1256	1719		278	3498		193	3466	
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)	63	5	112	4	5	4	182	1724	5	14	1377	96
RTOR Reduction (vph)	0	48	0	0	4	0	0	0	0	0	5	0
Lane Group Flow (vph)	63	69	0	4	5	0	182	1729	0	14	1468	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.7	7.7		7.7	7.7		53.3	53.3		53.3	53.3	
Effective Green, g (s)	7.7	7.7		7.7	7.7		53.3	53.3		53.3	53.3	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.76	0.76		0.76	0.76	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	152	173		138	189		211	2663		146	2639	
v/s Ratio Prot		0.04			0.00			0.49			0.42	
v/s Ratio Perm	c0.05			0.00			c0.65			0.07		
v/c Ratio	0.41	0.40		0.03	0.03		0.86	0.65		0.10	0.56	
Uniform Delay, d1	29.0	29.0		27.8	27.8		5.8	3.9		2.1	3.5	
Progression Factor	1.00	1.00		1.00	1.00		2.22	1.24		0.69	0.71	
Incremental Delay, d2	1.8	1.5		0.1	0.1		4.5	0.1		1.1	0.7	
Delay (s)	30.9	30.5		27.9	27.9		17.4	5.0		2.6	3.2	
Level of Service	C	C		C	C		B	A		A	A	
Approach Delay (s)		30.6			27.9			6.2			3.2	
Approach LOS		C			C			A			A	

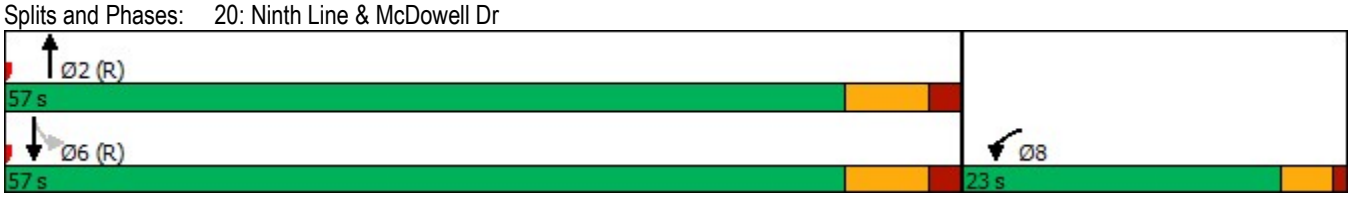
Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	117	1697	26	1441
Future Volume (vph)	117	1697	26	1441
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	57.0	57.0	57.0
Total Split (%)	28.8%	71.3%	71.3%	71.3%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.1	56.9	56.9	56.9
Actuated g/C Ratio	0.15	0.71	0.71	0.71
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	14.7	7.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	14.7	7.2
LOS	C	B	B	A
Approach Delay	34.9	10.7		7.4
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 20: Ninth Line & McDowell Dr



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	176	1902	26	1441
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	14.7	7.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	14.7	7.2
Queue Length 50th (m)	19.5	71.7	1.1	42.2
Queue Length 95th (m)	34.3	125.0	7.2	71.5
Internal Link Dist (m)	322.0	187.3		341.1
Turn Bay Length (m)			25.0	
Base Capacity (vph)	438	2484	94	2545
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.77	0.28	0.57

Intersection Summary

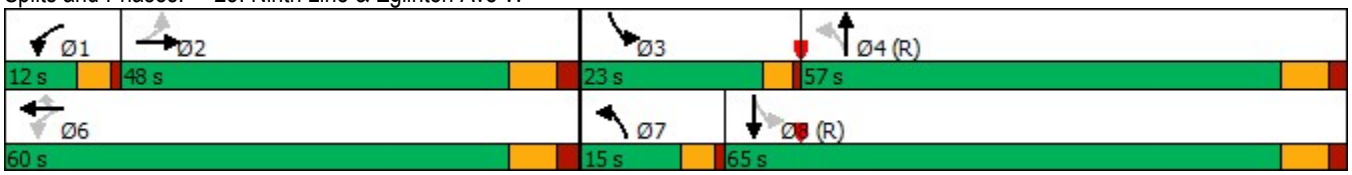
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	117	59	1697	205	26	1441
Future Volume (vph)	117	59	1697	205	26	1441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.98		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1757		3480		1785	3579
Flt Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1757		3480		133	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	59	1697	205	26	1441
RTOR Reduction (vph)	24	0	9	0	0	0
Lane Group Flow (vph)	152	0	1893	0	26	1441
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	12.1		56.9		56.9	56.9
Effective Green, g (s)	12.1		56.9		56.9	56.9
Actuated g/C Ratio	0.15		0.71		0.71	0.71
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	265		2475		94	2545
v/s Ratio Prot	c0.09		c0.54			0.40
v/s Ratio Perm					0.20	
v/c Ratio	0.57		0.76		0.28	0.57
Uniform Delay, d1	31.6		7.3		4.2	5.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	3.0		2.3		7.2	0.9
Delay (s)	34.6		9.6		11.3	6.5
Level of Service	C		A		B	A
Approach Delay (s)	34.6		9.6			6.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	54	562	154	728	538	110	1244	374	1042
Future Volume (vph)	54	562	154	728	538	110	1244	374	1042
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases		2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	11.0	40.0
Total Split (s)	48.0	48.0	12.0	60.0	60.0	15.0	57.0	23.0	65.0
Total Split (%)	34.3%	34.3%	8.6%	42.9%	42.9%	10.7%	40.7%	16.4%	46.4%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	40.5	40.5	55.5	52.5	52.5	62.9	50.0	76.0	58.1
Actuated g/C Ratio	0.29	0.29	0.40	0.38	0.38	0.45	0.36	0.54	0.42
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	192.4	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	192.4	31.1
LOS	F	F	F	F	C	E	F	F	C
Approach Delay		135.9		68.0			124.3		72.3
Approach LOS		F		E			F		E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 20 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 95.4	Intersection LOS: F
Intersection Capacity Utilization 128.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	622	154	728	538	110	1452	374	1091
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	192.4	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	192.4	31.1
Queue Length 50th (m)	~15.3	~185.5	~27.1	~200.2	66.6	13.9	~232.4	~108.4	98.9
Queue Length 95th (m)	#41.7	#252.6	#69.0	#268.9	110.6	#40.9	#272.2	#166.9	107.0
Internal Link Dist (m)		373.3		388.7			291.0		251.3
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	50	542	148	699	712	139	1231	287	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.79	1.18	1.30	0.74

Intersection Summary

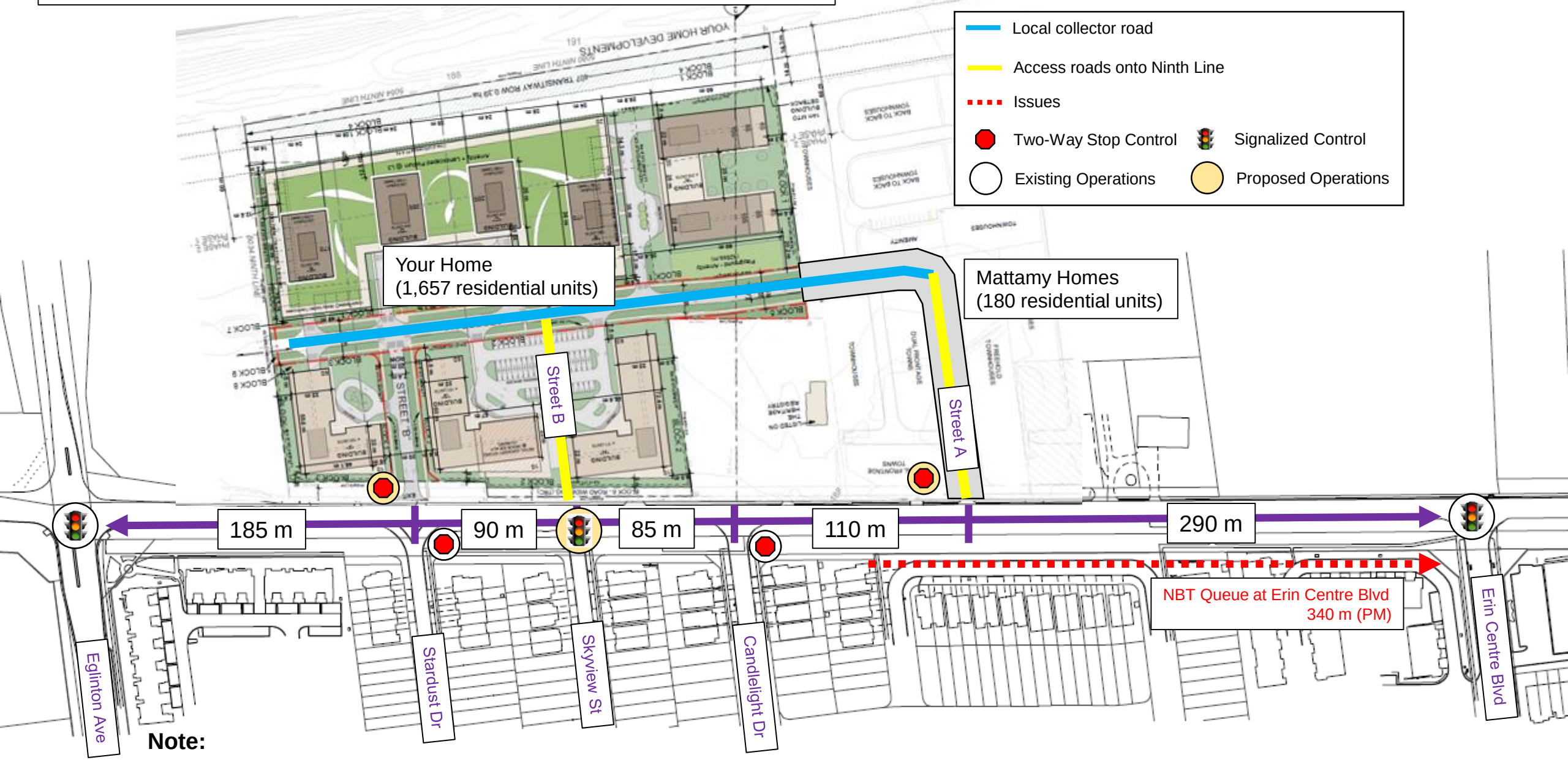
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Future Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1863		1733	1865	1479	1069	3418		1716	3558	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.14	1.00		0.07	1.00	
Satd. Flow (perm)	173	1863		162	1865	1479	157	3418		134	3558	
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)	54	562	60	154	728	538	110	1244	208	374	1042	49
RTOR Reduction (vph)	0	3	0	0	0	158	0	10	0	0	2	0
Lane Group Flow (vph)	54	619	0	154	728	381	110	1442	0	374	1089	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Effective Green, g (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Actuated g/C Ratio	0.29	0.29		0.38	0.38	0.38	0.43	0.36		0.52	0.42	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	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)	50	538		144	699	554	135	1220		284	1476	
v/s Ratio Prot		c0.33		0.06	c0.39		0.06	0.42		c0.18	0.31	
v/s Ratio Perm	0.31			0.34		0.26	0.29			c0.51		
v/c Ratio	1.08	1.15		1.07	1.04	0.69	0.81	1.18		1.32	0.74	
Uniform Delay, d1	49.8	49.8		37.8	43.8	36.8	28.3	45.0		46.2	34.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.04	0.81	
Incremental Delay, d2	151.5	87.7		94.7	45.3	3.5	30.0	90.7		162.6	2.9	
Delay (s)	201.2	137.4		132.6	89.1	40.4	58.3	135.7		210.7	30.9	
Level of Service	F	F		F	F	D	E	F		F	C	
Approach Delay (s)		142.5			75.3			130.2			76.8	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	101.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	128.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Case B: Signalization at Skyview Street (PREFERRED)



Note:

- All queuing / storage values rounded up.
- Intersection spacing is ‘middle-of-intersection’ to ‘middle-of-intersection’

Appendix E

Your Homes Analysis – Case C

HCM Unsignalized Intersection Capacity Analysis
61: Ninth Line & Skyview Access/Skyview St

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	5	173	5	5	12	67	1081	2	2	1718	33
Future Volume (Veh/h)	93	5	173	5	5	12	67	1081	2	2	1718	33
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)	93	5	173	5	5	12	67	1081	2	2	1718	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (m)								275				
pX, platoon unblocked	0.76	0.76		0.76	0.76	0.76				0.76		
vC, conflicting volume	2428	2956	876	2254	2971	542	1751			1083		
vC1, stage 1 conf vol	1738	1738		1216	1216							
vC2, stage 2 conf vol	689	1217		1038	1755							
vCu, unblocked vol	2243	2941	876	2014	2962	0	1751			466		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	96	41	83	92	99	81			100		
cM capacity (veh/h)	87	119	292	29	66	820	354			826		

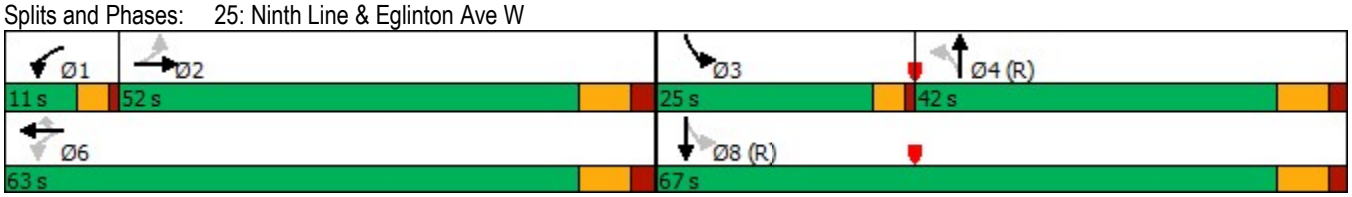
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	93	178	5	17	67	721	362	2	1145	606
Volume Left	93	0	5	0	67	0	0	2	0	0
Volume Right	0	173	0	12	0	0	2	0	0	33
cSH	87	281	29	188	354	1700	1700	826	1700	1700
Volume to Capacity	1.07	0.63	0.17	0.09	0.19	0.42	0.21	0.00	0.67	0.36
Queue Length 95th (m)	44.1	27.8	3.7	2.1	4.8	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	204.1	37.6	153.2	26.1	17.5	0.0	0.0	9.4	0.0	0.0
Lane LOS	F	E	F	D	C			A		
Approach Delay (s)	94.7		55.0		1.0			0.0		
Approach LOS	F		F							

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	38	612	99	264	256	28	856	400	1316
Future Volume (vph)	38	612	99	264	256	28	856	400	1316
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2	1	6			4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	4	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.0	32.5	32.5	40.0	40.0	11.0	40.0
Total Split (s)	52.0	52.0	11.0	63.0	63.0	42.0	42.0	25.0	67.0
Total Split (%)	40.0%	40.0%	8.5%	48.5%	48.5%	32.3%	32.3%	19.2%	51.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	44.5	44.5	59.0	55.5	55.5	35.0	35.0	63.0	60.0
Actuated g/C Ratio	0.34	0.34	0.45	0.43	0.43	0.27	0.27	0.48	0.46
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.7	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.7	36.3
LOS	C	F	D	C	A	F	F	F	D
Approach Delay		122.8		19.4			99.8		59.7
Approach LOS		F		B			F		E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 50 (38%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 75.2	Intersection LOS: E
Intersection Capacity Utilization 114.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	735	99	264	256	28	1006	400	1386
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.7	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.7	36.3
Queue Length 50th (m)	6.1	~204.5	13.3	40.9	0.0	6.2	~138.3	~99.4	141.5
Queue Length 95th (m)	13.8	#273.2	#29.2	60.5	14.3	#24.4	#176.8	#155.2	174.0
Internal Link Dist (m)		373.3		388.7			291.0		251.0
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	358	633	153	796	778	34	930	337	1642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Future Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1834		1733	1865	1479	1069	3416		1716	3555	
Flt Permitted	0.60	1.00		0.08	1.00	1.00	0.11	1.00		0.10	1.00	
Satd. Flow (perm)	1047	1834		150	1865	1479	129	3416		185	3555	
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)	38	612	123	99	264	256	28	856	150	400	1316	70
RTOR Reduction (vph)	0	5	0	0	0	147	0	11	0	0	3	0
Lane Group Flow (vph)	38	730	0	99	264	109	28	995	0	400	1383	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Effective Green, g (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Actuated g/C Ratio	0.34	0.34		0.43	0.43	0.43	0.27	0.27		0.46	0.46	
Clearance Time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	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)	358	627		149	796	631	34	919		332	1640	
v/s Ratio Prot		c0.40		c0.04	0.14			0.29		c0.19	0.39	
v/s Ratio Perm	0.04			0.25		0.07	0.22			c0.36		
v/c Ratio	0.11	1.16		0.66	0.33	0.17	0.82	1.08		1.20	0.84	
Uniform Delay, d1	29.2	42.8		30.7	24.9	23.1	44.6	47.5		40.7	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.01	1.02	
Incremental Delay, d2	0.6	90.4		10.6	1.1	0.6	105.9	54.7		113.6	4.6	
Delay (s)	29.8	133.1		41.3	26.0	23.6	150.5	102.2		154.7	35.9	
Level of Service	C	F		D	C	C	F	F		F	D	
Approach Delay (s)		128.0			27.5			103.5			62.5	
Approach LOS		F			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	79.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Skyview Access/Skyview St

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	5	112	4	5	4	182	1724	5	14	1377	96
Future Volume (Veh/h)	63	5	112	4	5	4	182	1724	5	14	1377	96
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)	63	5	112	4	5	4	182	1724	5	14	1377	96
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								275				
pX, platoon unblocked	0.66	0.66		0.66	0.66	0.66				0.66		
vC, conflicting volume	2686	3546	736	2922	3592	864	1473			1729		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2525	3825	736	2881	3894	0	1473			1079		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	69	0	0	99	60			97		
cM capacity (veh/h)	0	1	361	0	1	717	454			425		

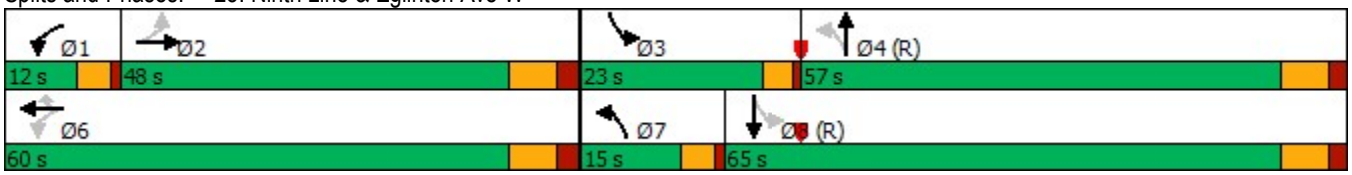
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	63	117	4	9	182	1149	580	14	918	555
Volume Left	63	0	4	0	182	0	0	14	0	0
Volume Right	0	112	0	4	0	0	5	0	0	96
cSH	0	31	0	2	454	1700	1700	425	1700	1700
Volume to Capacity	Err	3.82	Err	3.91	0.40	0.68	0.34	0.03	0.54	0.33
Queue Length 95th (m)	Err	Err	Err	Err	13.3	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	Err	Err	Err	Err	18.2	0.0	0.0	13.8	0.0	0.0
Lane LOS	F	F	F	F	C			B		
Approach Delay (s)	Err		Err		1.7			0.1		
Approach LOS	F		F							

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	54	562	154	728	538	110	1244	374	1042
Future Volume (vph)	54	562	154	728	538	110	1244	374	1042
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases		2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	11.0	40.0
Total Split (s)	48.0	48.0	12.0	60.0	60.0	15.0	57.0	23.0	65.0
Total Split (%)	34.3%	34.3%	8.6%	42.9%	42.9%	10.7%	40.7%	16.4%	46.4%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	40.5	40.5	55.5	52.5	52.5	62.9	50.0	76.0	58.1
Actuated g/C Ratio	0.29	0.29	0.40	0.38	0.38	0.45	0.36	0.54	0.42
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	192.8	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	192.8	31.9
LOS	F	F	F	F	C	E	F	F	C
Approach Delay		135.9		68.0			124.3		73.0
Approach LOS		F		E			F		E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 20 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 95.5	Intersection LOS: F
Intersection Capacity Utilization 128.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	622	154	728	538	110	1452	374	1091
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	192.8	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	192.8	31.9
Queue Length 50th (m)	~15.3	~185.5	~27.1	~200.2	66.6	13.9	~232.4	~108.2	113.4
Queue Length 95th (m)	#41.7	#252.6	#69.0	#268.9	110.6	#40.9	#272.2	#166.6	123.7
Internal Link Dist (m)		373.3		388.7			291.0		251.3
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	50	542	148	699	712	139	1231	287	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.79	1.18	1.30	0.74

Intersection Summary

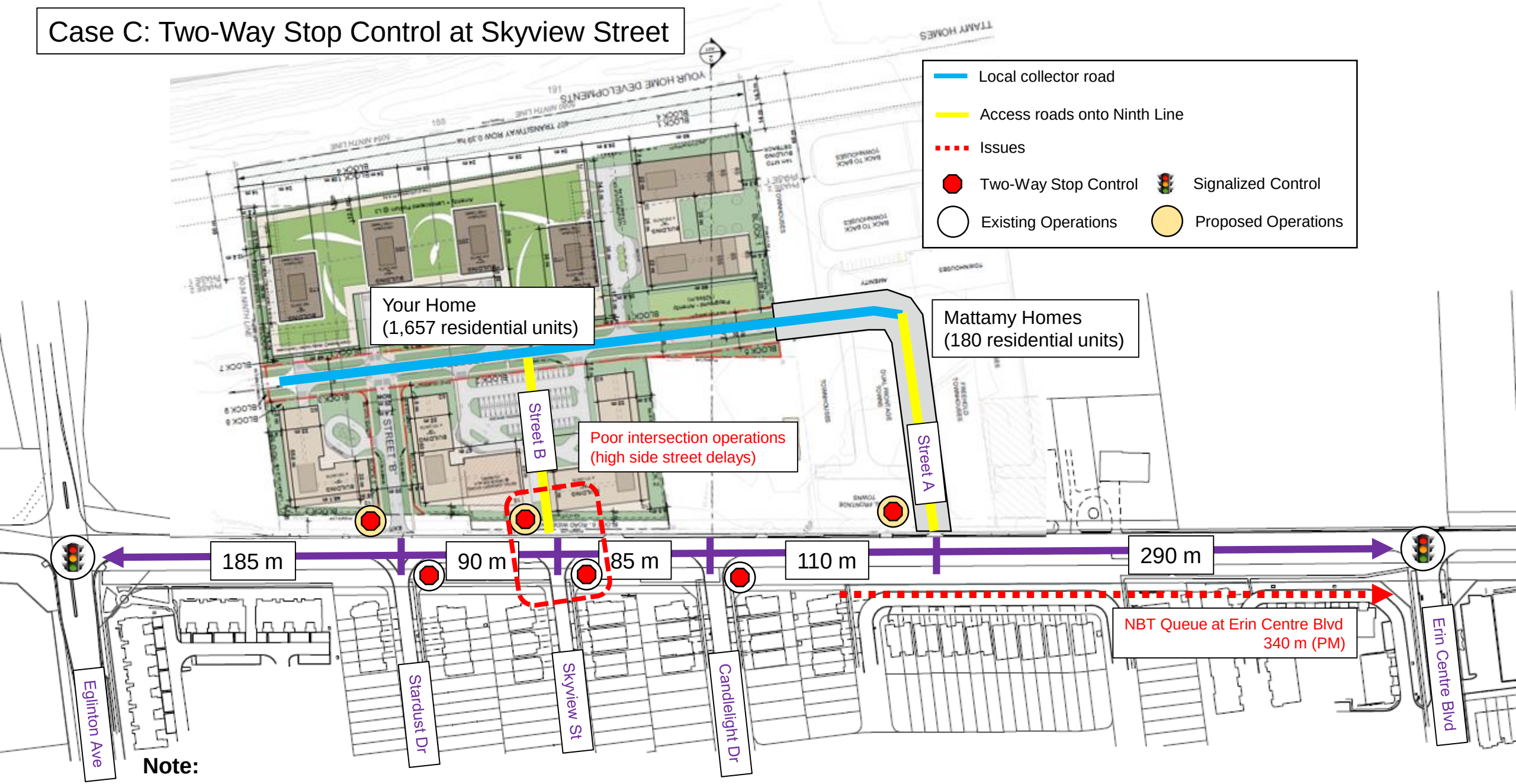
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Future Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1863		1733	1865	1479	1069	3418		1716	3558	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.14	1.00		0.07	1.00	
Satd. Flow (perm)	173	1863		162	1865	1479	157	3418		134	3558	
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)	54	562	60	154	728	538	110	1244	208	374	1042	49
RTOR Reduction (vph)	0	3	0	0	0	158	0	10	0	0	2	0
Lane Group Flow (vph)	54	619	0	154	728	381	110	1442	0	374	1089	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Effective Green, g (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Actuated g/C Ratio	0.29	0.29		0.38	0.38	0.38	0.43	0.36		0.52	0.42	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	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)	50	538		144	699	554	135	1220		284	1476	
v/s Ratio Prot		c0.33		0.06	c0.39		0.06	0.42		c0.18	0.31	
v/s Ratio Perm	0.31			0.34		0.26	0.29			c0.51		
v/c Ratio	1.08	1.15		1.07	1.04	0.69	0.81	1.18		1.32	0.74	
Uniform Delay, d1	49.8	49.8		37.8	43.8	36.8	28.3	45.0		46.2	34.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.03	0.83	
Incremental Delay, d2	151.5	87.7		94.7	45.3	3.5	30.0	90.7		163.3	3.0	
Delay (s)	201.2	137.4		132.6	89.1	40.4	58.3	135.7		210.8	31.6	
Level of Service	F	F		F	F	D	E	F		F	C	
Approach Delay (s)		142.5			75.3			130.2			77.4	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	101.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	128.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Case C: Two-Way Stop Control at Skyview Street



Note:

- All queuing / storage values rounded up.
- Intersection spacing is ‘middle-of-intersection’ to ‘middle-of-intersection’

Appendix E

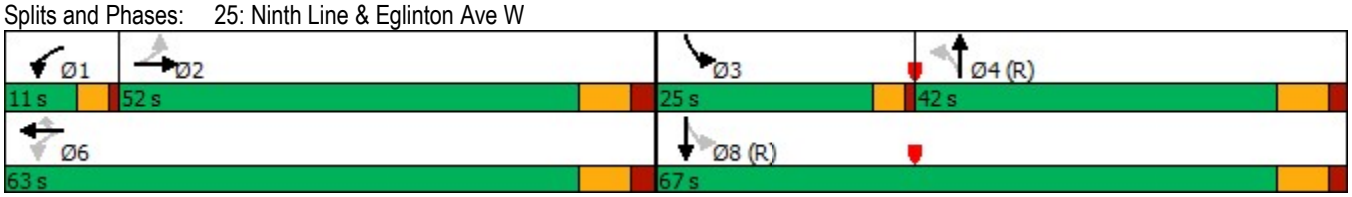
Your Homes Analysis – Updated Analysis (Case B Preferred)

Timings
25: Ninth Line & Eglinton Ave W

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	38	612	99	264	256	28	856	400	1316
Future Volume (vph)	38	612	99	264	256	28	856	400	1316
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2	1	6			4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	4	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.0	32.5	32.5	40.0	40.0	11.0	40.0
Total Split (s)	52.0	52.0	11.0	63.0	63.0	42.0	42.0	25.0	67.0
Total Split (%)	40.0%	40.0%	8.5%	48.5%	48.5%	32.3%	32.3%	19.2%	51.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	44.5	44.5	59.0	55.5	55.5	35.0	35.0	63.0	60.0
Actuated g/C Ratio	0.34	0.34	0.45	0.43	0.43	0.27	0.27	0.48	0.46
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	136.7	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	136.7	33.1
LOS	C	F	D	C	A	F	F	F	C
Approach Delay		122.8		19.4			99.8		56.3
Approach LOS		F		B			F		E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 64 (49%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 73.8	Intersection LOS: E
Intersection Capacity Utilization 114.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Queues
25: Ninth Line & Eglinton Ave W

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	735	99	264	256	28	1006	400	1386
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	136.7	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	136.7	33.1
Queue Length 50th (m)	6.1	~204.5	13.3	40.9	0.0	6.2	~138.3	~101.1	135.4
Queue Length 95th (m)	13.8	#273.2	#29.2	60.5	14.3	#24.4	#176.8	m#150.6	163.1
Internal Link Dist (m)		373.3		388.7			291.0		251.0
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	358	633	153	796	778	34	930	337	1642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84

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.

HCM Signalized Intersection Capacity Analysis
25: Ninth Line & Eglinton Ave W

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Future Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1834		1733	1865	1479	1069	3416		1716	3555	
Flt Permitted	0.60	1.00		0.08	1.00	1.00	0.11	1.00		0.10	1.00	
Satd. Flow (perm)	1047	1834		150	1865	1479	129	3416		185	3555	
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)	38	612	123	99	264	256	28	856	150	400	1316	70
RTOR Reduction (vph)	0	5	0	0	0	147	0	11	0	0	3	0
Lane Group Flow (vph)	38	730	0	99	264	109	28	995	0	400	1383	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Effective Green, g (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Actuated g/C Ratio	0.34	0.34		0.43	0.43	0.43	0.27	0.27		0.46	0.46	
Clearance Time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	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)	358	627		149	796	631	34	919		332	1640	
v/s Ratio Prot		c0.40		c0.04	0.14			0.29		c0.19	0.39	
v/s Ratio Perm	0.04			0.25		0.07	0.22			c0.36		
v/c Ratio	0.11	1.16		0.66	0.33	0.17	0.82	1.08		1.20	0.84	
Uniform Delay, d1	29.2	42.8		30.7	24.9	23.1	44.6	47.5		40.7	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.06	0.95	
Incremental Delay, d2	0.6	90.4		10.6	1.1	0.6	105.9	54.7		108.5	3.4	
Delay (s)	29.8	133.1		41.3	26.0	23.6	150.5	102.2		151.7	32.7	
Level of Service	C	F		D	C	C	F	F		F	C	
Approach Delay (s)		128.0			27.5			103.5			59.4	
Approach LOS		F			C			F			E	

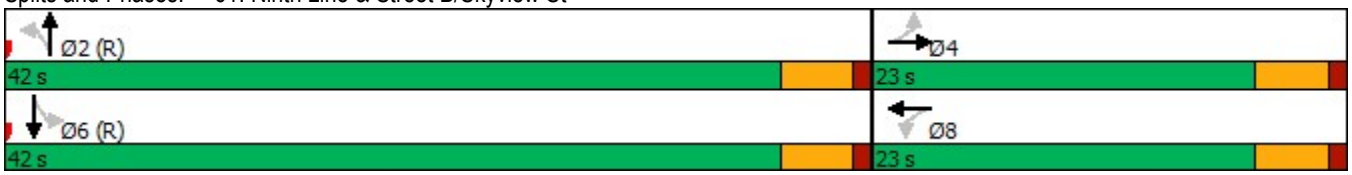
Intersection Summary			
HCM 2000 Control Delay	78.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Timings
61: Ninth Line & Street B/Skyview St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	116	5	5	5	100	1081	2	1718
Future Volume (vph)	116	5	5	5	100	1081	2	1718
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0	23.0	23.0	42.0	42.0	42.0	42.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	64.6%	64.6%	64.6%	64.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	15.4	15.4	15.4	15.4	40.6	40.6	40.6	40.6
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.62	0.62	0.62	0.62
v/c Ratio	0.36	0.75	0.03	0.04	0.88	0.50	0.01	0.81
Control Delay	22.8	33.7	17.6	11.4	65.8	9.2	1.5	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.7	17.6	11.4	65.8	9.2	1.5	7.3
LOS	C	C	B	B	E	A	A	A
Approach Delay		30.6		12.8		14.0		7.3
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 61: Ninth Line & Street B/Skyview St



Queues
61: Ninth Line & Street B/Skyview St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	290	5	17	100	1083	2	1760
v/c Ratio	0.36	0.75	0.03	0.04	0.88	0.50	0.01	0.81
Control Delay	22.8	33.7	17.6	11.4	65.8	9.2	1.5	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.7	17.6	11.4	65.8	9.2	1.5	7.3
Queue Length 50th (m)	10.5	27.3	0.4	0.4	15.3	49.8	0.0	9.7
Queue Length 95th (m)	21.0	47.0	2.4	3.9	m#21.7	m54.1	m0.0	#13.8
Internal Link Dist (m)		103.3		105.5		251.0		172.9
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	391	460	205	477	113	2186	252	2179
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	0.30	0.63	0.02	0.04	0.88	0.50	0.01	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.

HCM Signalized Intersection Capacity Analysis
61: Ninth Line & Street B/Skyview St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	5	285	5	5	12	100	1081	2	2	1718	42
Future Volume (vph)	116	5	285	5	5	12	100	1081	2	2	1718	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1571		1750	1647		1750	3499		1750	3487	
Flt Permitted	0.75	1.00		0.39	1.00		0.10	1.00		0.22	1.00	
Satd. Flow (perm)	1375	1571		723	1647		181	3499		405	3487	
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)	116	5	285	5	5	12	100	1081	2	2	1718	42
RTOR Reduction (vph)	0	14	0	0	9	0	0	0	0	0	2	0
Lane Group Flow (vph)	116	276	0	5	8	0	100	1083	0	2	1758	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.4	15.4		15.4	15.4		40.6	40.6		40.6	40.6	
Effective Green, g (s)	15.4	15.4		15.4	15.4		40.6	40.6		40.6	40.6	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.62	0.62		0.62	0.62	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	325	372		171	390		113	2185		252	2178	
v/s Ratio Prot		c0.18			0.00			0.31			0.50	
v/s Ratio Perm	0.08			0.01			c0.55			0.00		
v/c Ratio	0.36	0.74		0.03	0.02		0.88	0.50		0.01	0.81	
Uniform Delay, d1	20.7	23.0		19.1	19.0		10.2	6.6		4.6	9.2	
Progression Factor	1.00	1.00		1.00	1.00		2.27	1.24		0.26	0.37	
Incremental Delay, d2	0.7	7.7		0.1	0.0		35.4	0.4		0.0	2.6	
Delay (s)	21.3	30.7		19.1	19.0		58.7	8.6		1.2	6.0	
Level of Service	C	C		B	B		E	A		A	A	
Approach Delay (s)		28.0			19.1			12.8			6.0	
Approach LOS		C			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

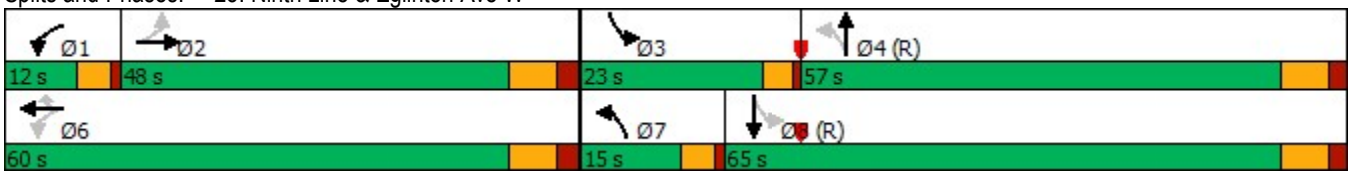
c Critical Lane Group

Timings
25: Ninth Line & Eglinton Ave W

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	54	562	154	728	538	110	1244	374	1042
Future Volume (vph)	54	562	154	728	538	110	1244	374	1042
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases		2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	11.0	40.0
Total Split (s)	48.0	48.0	12.0	60.0	60.0	15.0	57.0	23.0	65.0
Total Split (%)	34.3%	34.3%	8.6%	42.9%	42.9%	10.7%	40.7%	16.4%	46.4%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	40.5	40.5	55.5	52.5	52.5	62.9	50.0	76.0	58.1
Actuated g/C Ratio	0.29	0.29	0.40	0.38	0.38	0.45	0.36	0.54	0.42
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	183.2	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	183.2	31.1
LOS	F	F	F	F	C	E	F	F	C
Approach Delay		135.9		68.0			124.3		69.9
Approach LOS		F		E			F		E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 25 (18%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 94.7	Intersection LOS: F
Intersection Capacity Utilization 128.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Queues
25: Ninth Line & Eglinton Ave W

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	622	154	728	538	110	1452	374	1091
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	183.2	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	183.2	31.1
Queue Length 50th (m)	~15.3	~185.5	~27.1	~200.2	66.6	13.9	~232.4	~110.3	104.9
Queue Length 95th (m)	#41.7	#252.6	#69.0	#268.9	110.6	#40.9	#272.2	m#136.0	m123.2
Internal Link Dist (m)		373.3		388.7			291.0		251.3
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	50	542	148	699	712	139	1231	287	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.79	1.18	1.30	0.74

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Future Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1863		1733	1865	1479	1069	3418		1716	3558	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.14	1.00		0.07	1.00	
Satd. Flow (perm)	173	1863		162	1865	1479	157	3418		134	3558	
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)	54	562	60	154	728	538	110	1244	208	374	1042	49
RTOR Reduction (vph)	0	3	0	0	0	158	0	10	0	0	2	0
Lane Group Flow (vph)	54	619	0	154	728	381	110	1442	0	374	1089	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Effective Green, g (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Actuated g/C Ratio	0.29	0.29		0.38	0.38	0.38	0.43	0.36		0.52	0.42	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	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)	50	538		144	699	554	135	1220		284	1476	
v/s Ratio Prot		c0.33		0.06	c0.39		0.06	0.42		c0.18	0.31	
v/s Ratio Perm	0.31			0.34		0.26	0.29			c0.51		
v/c Ratio	1.08	1.15		1.07	1.04	0.69	0.81	1.18		1.32	0.74	
Uniform Delay, d1	49.8	49.8		37.8	43.8	36.8	28.3	45.0		46.2	34.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.97	0.84	
Incremental Delay, d2	151.5	87.7		94.7	45.3	3.5	30.0	90.7		155.2	1.8	
Delay (s)	201.2	137.4		132.6	89.1	40.4	58.3	135.7		199.8	30.9	
Level of Service	F	F		F	F	D	E	F		F	C	
Approach Delay (s)		142.5			75.3			130.2			74.0	
Approach LOS		F			E			F			E	

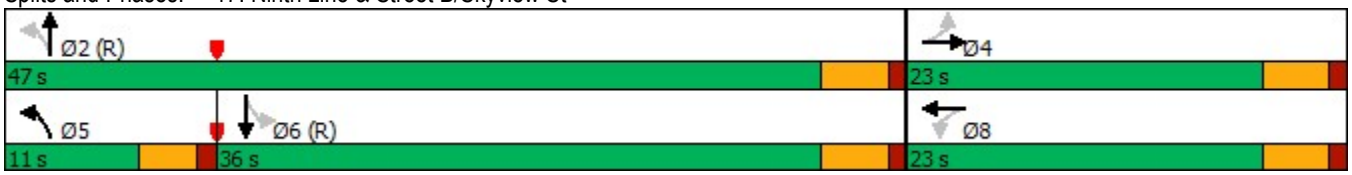
Intersection Summary			
HCM 2000 Control Delay	100.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	128.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Timings
17: Ninth Line & Street B/Skyview St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	78	5	4	5	293	1724	14	1377
Future Volume (vph)	78	5	4	5	293	1724	14	1377
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	11.0	22.5	22.5	22.5
Total Split (s)	23.0	23.0	23.0	23.0	11.0	47.0	36.0	36.0
Total Split (%)	32.9%	32.9%	32.9%	32.9%	15.7%	67.1%	51.4%	51.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.3	9.3	9.3	9.3	52.2	51.7	33.3	33.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.75	0.74	0.48	0.48
v/c Ratio	0.42	0.52	0.04	0.04	0.63	0.67	0.12	0.91
Control Delay	34.1	10.3	25.0	20.1	24.3	7.8	11.1	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	10.3	25.0	20.1	24.3	7.8	11.1	25.6
LOS	C	B	C	C	C	A	B	C
Approach Delay		17.1		21.6		10.2		25.4
Approach LOS		B		C		B		C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 39 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Ninth Line & Street B/Skyview St



Queues
17: Ninth Line & Street B/Skyview St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	78	194	4	9	293	1729	14	1497
v/c Ratio	0.42	0.52	0.04	0.04	0.63	0.67	0.12	0.91
Control Delay	34.1	10.3	25.0	20.1	24.3	7.8	11.1	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	10.3	25.0	20.1	24.3	7.8	11.1	25.6
Queue Length 50th (m)	8.8	0.5	0.4	0.6	44.2	87.0	0.7	108.2
Queue Length 95th (m)	18.4	14.4	2.6	3.6	m45.4	m79.5	m2.0	#134.7
Internal Link Dist (m)		126.1		123.3		251.3		178.3
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	366	554	215	457	466	2585	120	1653
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	0.21	0.35	0.02	0.02	0.63	0.67	0.12	0.91

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 Signalized Intersection Capacity Analysis
17: Ninth Line & Street B/Skyview St

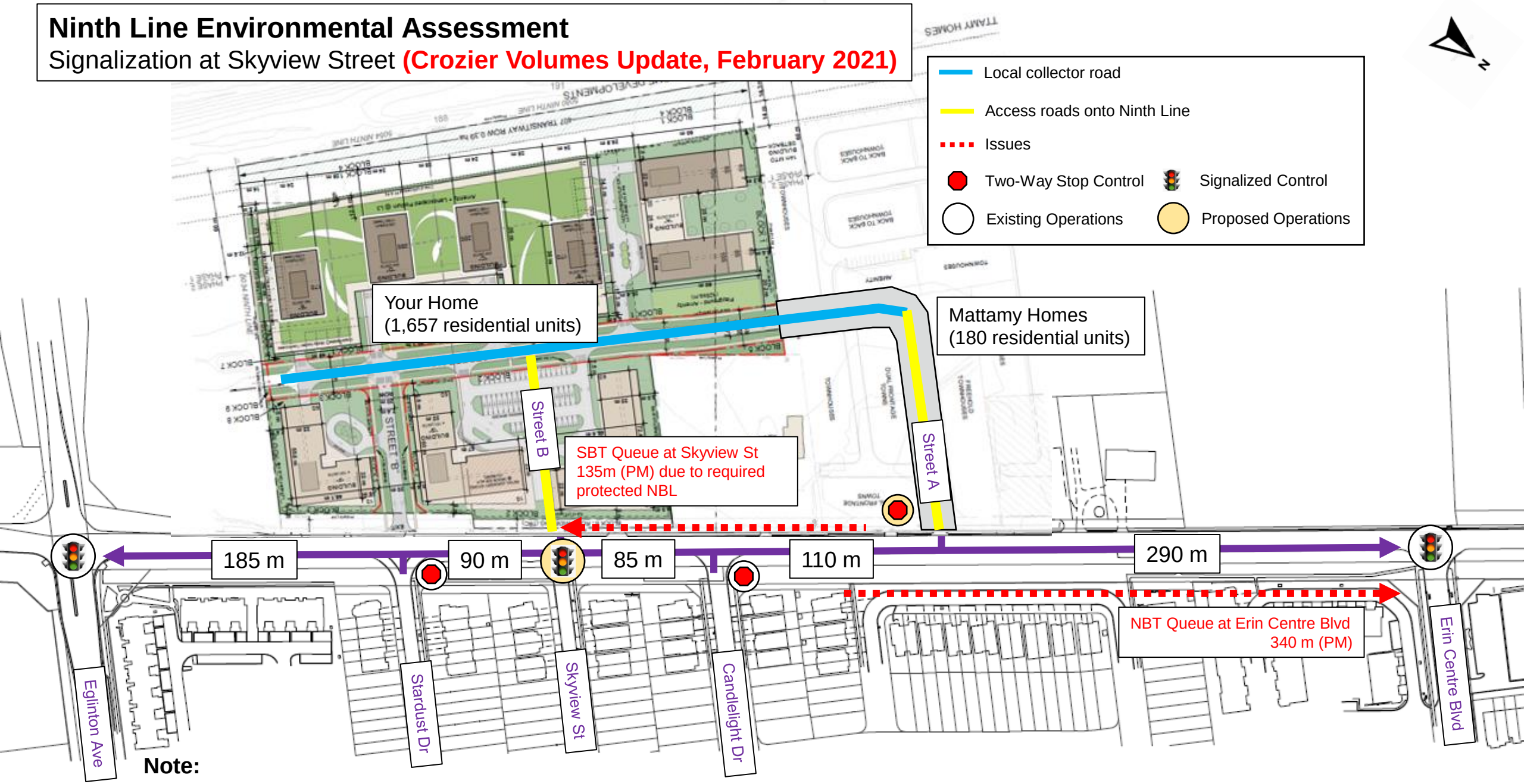
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	5	189	4	5	4	293	1724	5	14	1377	120
Future Volume (vph)	78	5	189	4	5	4	293	1724	5	14	1377	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1573		1750	1719		1750	3498		1750	3458	
Flt Permitted	0.75	1.00		0.44	1.00		0.11	1.00		0.14	1.00	
Satd. Flow (perm)	1385	1573		814	1719		198	3498		253	3458	
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)	78	5	189	4	5	4	293	1724	5	14	1377	120
RTOR Reduction (vph)	0	164	0	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	78	30	0	4	6	0	293	1729	0	14	1488	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.3	9.3		9.3	9.3		51.7	51.7		33.3	33.3	
Effective Green, g (s)	9.3	9.3		9.3	9.3		51.7	51.7		33.3	33.3	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.48	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	208		108	228		465	2583		120	1645	
v/s Ratio Prot		0.02			0.00		0.13	c0.49			c0.43	
v/s Ratio Perm	c0.06			0.00			0.34			0.06		
v/c Ratio	0.42	0.14		0.04	0.02		0.63	0.67		0.12	0.90	
Uniform Delay, d1	27.9	26.8		26.4	26.4		15.2	4.7		10.2	16.9	
Progression Factor	1.00	1.00		1.00	1.00		2.03	1.41		0.79	0.99	
Incremental Delay, d2	1.6	0.3		0.1	0.0		0.9	0.4		1.7	7.7	
Delay (s)	29.5	27.2		26.6	26.4		31.7	7.1		9.8	24.4	
Level of Service	C	C		C	C		C	A		A	C	
Approach Delay (s)		27.8			26.5			10.6			24.3	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Ninth Line Environmental Assessment

Signalization at Skyview Street **(Crozier Volumes Update, February 2021)**



Note:

- All queuing / storage values rounded up.
- Intersection spacing is 'middle-of-intersection' to 'middle-of-intersection'

NOT TO SCALE

Appendix F

2031 Synchro Results

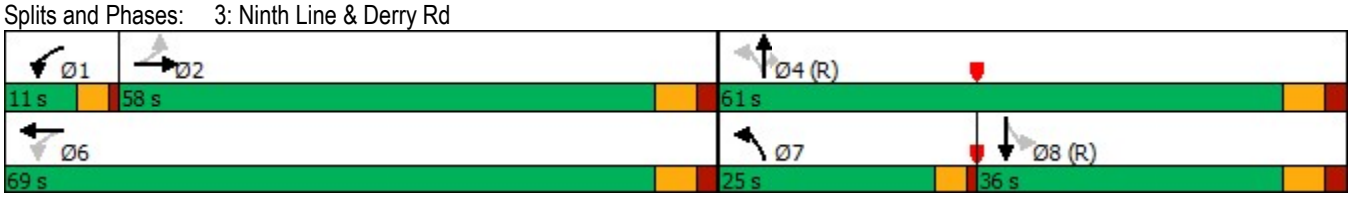
Appendix F

2031 Synchro Results – Scenario 1

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	209	1389	151	624	400	535	323	23	556
Future Volume (vph)	209	1389	151	624	400	535	323	23	556
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA
Protected Phases		2	1	6	7	4			8
Permitted Phases	2		6		4		4	8	
Detector Phase	2	2	1	6	7	4	4	8	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	7.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.1	30.1	11.0	30.1	11.0	29.4	29.4	29.4	29.4
Total Split (s)	58.0	58.0	11.0	69.0	25.0	61.0	61.0	36.0	36.0
Total Split (%)	44.6%	44.6%	8.5%	53.1%	19.2%	46.9%	46.9%	27.7%	27.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.1	2.1	1.0	2.1	1.0	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	4.0	6.1	4.0	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag	Lead		Lead			Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes
Recall Mode	Max	Max	None	Max	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	51.9	51.9	65.0	62.9	57.0	54.6	54.6	29.6	29.6
Actuated g/C Ratio	0.40	0.40	0.50	0.48	0.44	0.42	0.42	0.23	0.23
v/c Ratio	0.74	1.10	1.00	0.40	1.17	0.67	0.44	0.12	1.00
Control Delay	51.5	92.3	101.0	22.0	137.7	32.8	15.4	42.0	78.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	92.3	101.0	22.0	137.7	32.8	15.4	42.0	78.6
LOS	D	F	F	C	F	C	B	D	E
Approach Delay		87.5		36.6		61.7			77.6
Approach LOS		F		D		E			E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 16 (12%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 70.0	Intersection LOS: E
Intersection Capacity Utilization 115.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	209	1567	151	668	400	535	323	23	833
v/c Ratio	0.74	1.10	1.00	0.40	1.17	0.67	0.44	0.12	1.00
Control Delay	51.5	92.3	101.0	22.0	137.7	32.8	15.4	42.0	78.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	92.3	101.0	22.0	137.7	32.8	15.4	42.0	78.6
Queue Length 50th (m)	41.7	~219.6	21.5	51.0	~99.1	89.5	28.5	4.3	~98.4
Queue Length 95th (m)	#78.6	#259.4	#61.9	64.5	#158.1	133.1	63.4	11.7	#138.7
Internal Link Dist (m)		119.7		244.5		681.0			237.0
Turn Bay Length (m)	75.0		80.0		130.0		110.0	95.0	
Base Capacity (vph)	281	1427	151	1687	343	798	737	188	829
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.10	1.00	0.40	1.17	0.67	0.44	0.12	1.00

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	1389	178	151	624	44	400	535	323	23	556	277
Future Volume (vph)	209	1389	178	151	624	44	400	535	323	23	556	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.1	6.1		4.0	6.1		4.0	6.4	6.4	6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1684	3556		1733	3479		1750	1902	1566	1716	3434	
Flt Permitted	0.40	1.00		0.07	1.00		0.12	1.00	1.00	0.46	1.00	
Satd. Flow (perm)	705	3556		131	3479		219	1902	1566	826	3434	
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)	209	1389	178	151	624	44	400	535	323	23	556	277
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	80	0	48	0
Lane Group Flow (vph)	209	1559	0	151	664	0	400	535	243	23	785	0
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		
Actuated Green, G (s)	51.9	51.9		62.9	62.9		54.6	54.6	54.6	29.6	29.6	
Effective Green, g (s)	51.9	51.9		62.9	62.9		54.6	54.6	54.6	29.6	29.6	
Actuated g/C Ratio	0.40	0.40		0.48	0.48		0.42	0.42	0.42	0.23	0.23	
Clearance Time (s)	6.1	6.1		4.0	6.1		4.0	6.4	6.4	6.4	6.4	
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)	281	1419		149	1683		339	798	657	188	781	
v/s Ratio Prot		c0.44		c0.05	0.19		c0.19	0.28			0.23	
v/s Ratio Perm	0.30			0.44			c0.30		0.16	0.03		
v/c Ratio	0.74	1.10		1.01	0.39		1.18	0.67	0.37	0.12	1.01	
Uniform Delay, d1	33.4	39.1		34.1	21.4		39.8	30.4	25.9	39.9	50.2	
Progression Factor	1.00	1.00		1.00	1.00		1.24	0.94	0.93	1.00	1.00	
Incremental Delay, d2	16.3	55.7		77.3	0.7		103.1	3.6	1.3	1.3	33.5	
Delay (s)	49.7	94.8		111.4	22.1		152.4	32.2	25.5	41.2	83.7	
Level of Service	D	F		F	C		F	C	C	D	F	
Approach Delay (s)		89.5			38.6			68.7			82.6	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	73.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	119	1301	88	826
Future Volume (vph)	119	1301	88	826
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	22.5	22.5	22.5
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	11.2	43.3	43.3	43.3
Actuated g/C Ratio	0.17	0.67	0.67	0.67
v/c Ratio	0.60	0.61	0.51	0.35
Control Delay	25.5	3.6	10.8	3.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	3.6	10.8	3.0
LOS	C	A	B	A
Approach Delay	25.5	3.6		3.8
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 56 (86%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 5.4	Intersection LOS: A
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	206	1429	88	826
v/c Ratio	0.60	0.61	0.51	0.35
Control Delay	25.5	3.6	10.8	3.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	3.6	10.8	3.0
Queue Length 50th (m)	16.1	17.5	3.8	17.0
Queue Length 95th (m)	29.8	22.1	m4.7	m20.3
Internal Link Dist (m)	168.5	176.6		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	520	2360	173	2359
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.61	0.51	0.35

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	119	87	1301	128	88	826
Future Volume (vph)	119	87	1301	128	88	826
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1751		3530		1785	3544
Flt Permitted	0.97		1.00		0.14	1.00
Satd. Flow (perm)	1751		3530		261	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	119	87	1301	128	88	826
RTOR Reduction (vph)	41	0	9	0	0	0
Lane Group Flow (vph)	165	0	1420	0	88	826
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	11.2		43.3		43.3	43.3
Effective Green, g (s)	11.2		43.3		43.3	43.3
Actuated g/C Ratio	0.17		0.67		0.67	0.67
Clearance Time (s)	6.0		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	301		2351		173	2360
v/s Ratio Prot	c0.09		c0.40			0.23
v/s Ratio Perm					0.34	
v/c Ratio	0.55		0.60		0.51	0.35
Uniform Delay, d1	24.6		6.1		5.5	4.7
Progression Factor	1.00		0.38		0.99	0.56
Incremental Delay, d2	2.1		0.9		2.6	0.1
Delay (s)	26.6		3.3		8.1	2.8
Level of Service	C		A		A	A
Approach Delay (s)	26.6		3.3			3.3
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	133	13	111	5	17	1256	120	828
Future Volume (vph)	133	13	111	5	17	1256	120	828
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	24.0	24.0	25.0	25.0	25.0	25.0
Total Split (s)	24.0	24.0	24.0	24.0	41.0	41.0	41.0	41.0
Total Split (%)	36.9%	36.9%	36.9%	36.9%	63.1%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.7	12.7	12.7	12.7	39.3	39.3	39.3	39.3
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.60	0.60	0.60	0.60
v/c Ratio	0.58	0.19	0.44	0.52	0.05	0.65	0.76	0.39
Control Delay	32.9	9.3	27.3	22.3	7.4	10.9	41.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	9.3	27.3	22.3	7.4	10.9	41.8	3.5
LOS	C	A	C	C	A	B	D	A
Approach Delay		25.0		24.2		10.8		8.2
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 23 (35%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 85.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	67	111	180	17	1392	120	845
v/c Ratio	0.58	0.19	0.44	0.52	0.05	0.65	0.76	0.39
Control Delay	32.9	9.3	27.3	22.3	7.4	10.9	41.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	9.3	27.3	22.3	7.4	10.9	41.8	3.5
Queue Length 50th (m)	13.6	1.2	11.0	13.6	0.7	44.8	8.5	10.0
Queue Length 95th (m)	24.9	8.1	20.6	25.9	3.3	79.3	#62.9	12.4
Internal Link Dist (m)		167.3		392.7		51.3		374.5
Turn Bay Length (m)			25.0		15.0		80.0	
Base Capacity (vph)	328	487	360	470	358	2137	157	2159
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	0.41	0.14	0.31	0.38	0.05	0.65	0.76	0.39

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	13	54	111	5	175	17	1256	136	120	828	17
Future Volume (vph)	133	13	54	111	5	175	17	1256	136	120	828	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		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	0.95	
Frt	1.00	0.88		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1619		1733	1589		1750	3519		1750	3568	
Flt Permitted	0.64	1.00		0.71	1.00		0.32	1.00		0.14	1.00	
Satd. Flow (perm)	1186	1619		1301	1589		593	3519		260	3568	
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)	133	13	54	111	5	175	17	1256	136	120	828	17
RTOR Reduction (vph)	0	43	0	0	35	0	0	10	0	0	2	0
Lane Group Flow (vph)	133	24	0	111	145	0	17	1382	0	120	843	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.7	12.7		12.7	12.7		39.3	39.3		39.3	39.3	
Effective Green, g (s)	12.7	12.7		12.7	12.7		39.3	39.3		39.3	39.3	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.60	0.60		0.60	0.60	
Clearance Time (s)	6.0	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	3.0	
Lane Grp Cap (vph)	231	316		254	310		358	2127		157	2157	
v/s Ratio Prot		0.01			0.09			0.39			0.24	
v/s Ratio Perm	c0.11			0.09			0.03			c0.46		
v/c Ratio	0.58	0.07		0.44	0.47		0.05	0.65		0.76	0.39	
Uniform Delay, d1	23.7	21.4		23.0	23.2		5.2	8.4		9.4	6.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.76	0.41	
Incremental Delay, d2	3.4	0.1		1.2	1.1		0.3	1.6		28.1	0.5	
Delay (s)	27.2	21.5		24.2	24.3		5.5	9.9		35.3	3.3	
Level of Service	C	C		C	C		A	A		D	A	
Approach Delay (s)		25.2			24.3			9.9			7.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	0	228	0	30	1011	30	954
Future Volume (vph)	93	0	228	0	30	1011	30	954
Turn Type	Perm	NA	D.Pm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		4		2		6	
Detector Phase	4	4	4	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.0	8.0
Minimum Split (s)	23.5	23.5	23.5	24.0	23.0	23.0	11.0	23.0
Total Split (s)	26.0	26.0	26.0	26.0	38.0	38.0	11.0	49.0
Total Split (%)	34.7%	34.7%	34.7%	34.7%	50.7%	50.7%	14.7%	65.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	17.5	17.5	17.5	17.5	40.1	40.1	47.5	44.5
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.53	0.53	0.63	0.59
v/c Ratio	0.32	0.20	0.80	0.22	0.10	0.61	0.09	0.45
Control Delay	25.9	4.4	48.3	0.9	8.5	14.0	6.6	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	4.4	48.3	0.9	8.5	14.0	6.6	9.8
LOS	C	A	D	A	A	B	A	A
Approach Delay		15.2		32.2		13.8		9.7
Approach LOS		B		C		B		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 35 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 61.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	93	228	117	30	1123	30	962
v/c Ratio	0.32	0.20	0.80	0.22	0.10	0.61	0.09	0.45
Control Delay	25.9	4.4	48.3	0.9	8.5	14.0	6.6	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	4.4	48.3	0.9	8.5	14.0	6.6	9.8
Queue Length 50th (m)	9.7	0.0	27.0	0.0	0.9	23.6	1.4	35.6
Queue Length 95th (m)	20.4	6.7	#54.4	0.0	m3.5	126.9	4.1	48.9
Internal Link Dist (m)		118.2		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	334	502	326	589	293	1847	330	2122
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	0.28	0.19	0.70	0.20	0.10	0.61	0.09	0.45

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	93	228	0	117	30	1011	112	30	954	8
Future Volume (vph)	93	0	93	228	0	117	30	1011	112	30	954	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3437		1785	3574	
Flt Permitted	0.68	1.00		0.70	1.00		0.30	1.00		0.16	1.00	
Satd. Flow (perm)	1256	1566		1223	1566		548	3437		302	3574	
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)	93	0	93	228	0	117	30	1011	112	30	954	8
RTOR Reduction (vph)	0	71	0	0	90	0	0	9	0	0	1	0
Lane Group Flow (vph)	93	22	0	228	27	0	30	1114	0	30	961	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		D.Pm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	17.5	17.5		17.5	17.5		37.7	37.7		44.5	44.5	
Effective Green, g (s)	17.5	17.5		17.5	17.5		37.7	37.7		44.5	44.5	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.50	0.50		0.59	0.59	
Clearance Time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	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)	293	365		285	365		275	1727		234	2120	
v/s Ratio Prot		0.01			0.02			c0.32		0.00	c0.27	
v/s Ratio Perm	0.07			c0.19			0.05			0.07		
v/c Ratio	0.32	0.06		0.80	0.07		0.11	0.64		0.13	0.45	
Uniform Delay, d1	23.8	22.4		27.1	22.4		9.8	13.7		8.0	8.5	
Progression Factor	1.00	1.00		1.00	1.00		0.66	0.96		1.00	1.00	
Incremental Delay, d2	0.6	0.1		14.8	0.1		0.6	1.3		0.2	0.7	
Delay (s)	24.4	22.4		41.9	22.5		7.0	14.5		8.2	9.2	
Level of Service	C	C		D	C		A	B		A	A	
Approach Delay (s)		23.4			35.3			14.3			9.2	
Approach LOS		C			D			B			A	

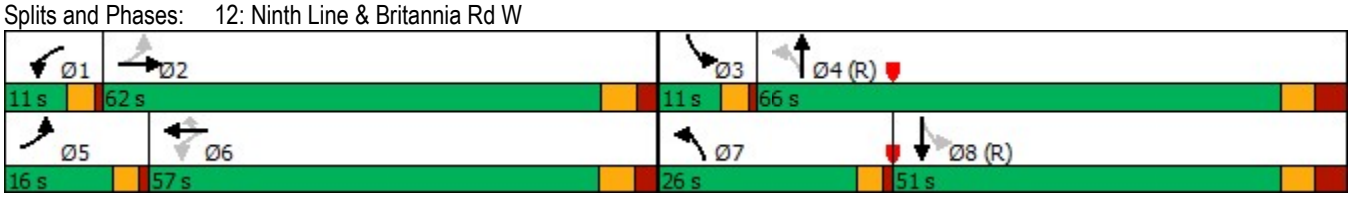
Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	151	1294	100	675	95	400	906	82	944
Future Volume (vph)	151	1294	100	675	95	400	906	82	944
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0
Minimum Split (s)	11.0	26.5	11.0	26.7	26.7	11.0	47.7	11.0	47.7
Total Split (s)	16.0	62.0	11.0	57.0	57.0	26.0	66.0	11.0	51.0
Total Split (%)	10.7%	41.3%	7.3%	38.0%	38.0%	17.3%	44.0%	7.3%	34.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.5	1.0	2.7	2.7	1.0	3.7	1.0	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.7	6.7	4.0	7.7	4.0	7.7
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	68.6	55.5	60.8	51.1	51.1	73.0	58.3	54.0	43.3
Actuated g/C Ratio	0.46	0.37	0.41	0.34	0.34	0.49	0.39	0.36	0.29
v/c Ratio	0.49	1.28	0.75	0.55	0.15	1.28	0.78	0.50	1.06
Control Delay	29.8	172.1	59.0	42.3	0.9	179.5	49.2	36.6	97.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	172.2	59.0	42.3	0.9	179.5	49.2	36.6	97.8
LOS	C	F	E	D	A	F	D	D	F
Approach Delay		160.5		39.7			84.9		93.5
Approach LOS		F		D			F		F

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 105.5	Intersection LOS: F
Intersection Capacity Utilization 125.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	151	1694	100	675	95	400	1060	82	1087
v/c Ratio	0.49	1.28	0.75	0.55	0.15	1.28	0.78	0.50	1.06
Control Delay	29.8	172.1	59.0	42.3	0.9	179.5	49.2	36.6	97.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	172.2	59.0	42.3	0.9	179.5	49.2	36.6	97.8
Queue Length 50th (m)	24.1	~307.6	15.5	79.5	0.0	~119.7	157.1	11.9	~171.5
Queue Length 95th (m)	37.6	#346.7	#39.9	97.8	1.1	m#169.7	178.0	m20.2	#212.2
Internal Link Dist (m)		80.1		420.4			341.1		608.8
Turn Bay Length (m)	80.0		70.0		70.0	75.0		60.0	
Base Capacity (vph)	314	1319	134	1230	617	312	1358	163	1021
Starvation Cap Reductn	0	25	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	0.48	1.31	0.75	0.55	0.15	1.28	0.78	0.50	1.06

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	1294	400	100	675	95	400	906	154	82	944	143
Future Volume (vph)	151	1294	400	100	675	95	400	906	154	82	944	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.5		4.0	6.7	6.7	4.0	7.7		4.0	7.7	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	3513		1767	3614	1521	1767	3471		1668	3512	
Flt Permitted	0.24	1.00		0.08	1.00	1.00	0.08	1.00		0.15	1.00	
Satd. Flow (perm)	452	3513		146	3614	1521	157	3471		272	3512	
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)	151	1294	400	100	675	95	400	906	154	82	944	143
RTOR Reduction (vph)	0	20	0	0	0	63	0	9	0	0	8	0
Lane Group Flow (vph)	151	1674	0	100	675	32	400	1051	0	82	1079	0
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	66.5	55.5		58.1	51.1	51.1	69.3	58.3		50.3	43.3	
Effective Green, g (s)	66.5	55.5		58.1	51.1	51.1	69.3	58.3		50.3	43.3	
Actuated g/C Ratio	0.44	0.37		0.39	0.34	0.34	0.46	0.39		0.34	0.29	
Clearance Time (s)	4.0	6.5		4.0	6.7	6.7	4.0	7.7		4.0	7.7	
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)	299	1299		132	1231	518	308	1349		156	1013	
v/s Ratio Prot	0.04	c0.48		c0.04	0.19		c0.19	0.30		0.02	0.31	
v/s Ratio Perm	0.19			0.26		0.02	c0.41			0.15		
v/c Ratio	0.51	1.29		0.76	0.55	0.06	1.30	0.78		0.53	1.07	
Uniform Delay, d1	27.3	47.2		37.7	40.1	33.3	48.9	40.2		36.2	53.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.99	1.15		1.17	1.06	
Incremental Delay, d2	1.3	136.0		21.7	1.8	0.2	149.8	3.1		2.8	45.9	
Delay (s)	28.7	183.2		59.3	41.9	33.5	198.1	49.4		45.4	102.4	
Level of Service	C	F		E	D	C	F	D		D	F	
Approach Delay (s)		170.6			43.0			90.1			98.4	
Approach LOS		F			D			F			F	

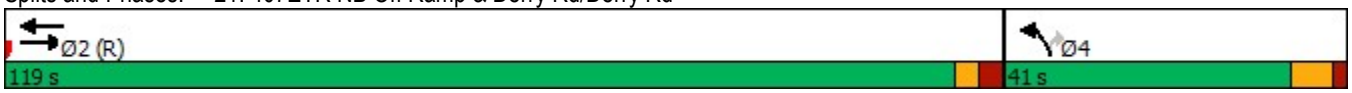
Intersection Summary			
HCM 2000 Control Delay	112.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	125.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1567	1102	19	185
Future Volume (vph)	1567	1102	19	185
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	119.0	119.0	41.0	41.0
Total Split (%)	74.4%	74.4%	25.6%	25.6%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	113.0	113.0	34.0	34.0
Actuated g/C Ratio	0.71	0.71	0.21	0.21
v/c Ratio	0.62	0.44	0.03	0.51
Control Delay	13.6	10.7	50.3	43.7
Queue Delay	0.4	0.0	0.0	0.0
Total Delay	14.0	10.7	50.3	43.7
LOS	B	B	D	D
Approach Delay	14.0	10.7	44.3	
Approach LOS	B	B	D	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1567	1102	19	185
v/c Ratio	0.62	0.44	0.03	0.51
Control Delay	13.6	10.7	50.3	43.7
Queue Delay	0.4	0.0	0.0	0.0
Total Delay	14.0	10.7	50.3	43.7
Queue Length 50th (m)	117.1	67.4	2.3	33.6
Queue Length 95th (m)	134.1	78.9	5.8	57.4
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2527	2478	623	364
Starvation Cap Reductn	416	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.44	0.03	0.51

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1567	0	0	1102	19	185
Future Volume (vph)	1567	0	0	1102	19	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1567	0	0	1102	19	185
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	1567	0	0	1102	19	141
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	113.0			113.0	34.0	34.0
Effective Green, g (s)	113.0			113.0	34.0	34.0
Actuated g/C Ratio	0.71			0.71	0.21	0.21
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2527			2478	623	320
v/s Ratio Prot	c0.44			0.31	0.01	
v/s Ratio Perm						c0.09
v/c Ratio	0.62			0.44	0.03	0.44
Uniform Delay, d1	12.3			10.1	49.9	54.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.2			0.6	0.1	4.4
Delay (s)	13.4			10.6	50.0	59.1
Level of Service	B			B	D	E
Approach Delay (s)	13.4			10.6	58.2	
Approach LOS	B			B	E	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	208	183	1267	142	1396
Future Volume (vph)	208	183	1267	142	1396
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	25.6	25.6	38.4	11.0	49.4
Total Split (%)	34.1%	34.1%	51.2%	14.7%	65.9%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.5	4.0	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	14.0	14.0	37.7	50.5	47.0
Actuated g/C Ratio	0.19	0.19	0.50	0.67	0.63
v/c Ratio	0.64	0.43	0.83	0.54	0.62
Control Delay	36.6	7.4	23.9	15.1	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	7.4	23.9	15.1	3.9
LOS	D	A	C	B	A
Approach Delay	22.9		23.9		4.9
Approach LOS	C		C		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 75.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	208	183	1457	142	1396
v/c Ratio	0.64	0.43	0.83	0.54	0.62
Control Delay	36.6	7.4	23.9	15.1	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	7.4	23.9	15.1	3.9
Queue Length 50th (m)	25.2	0.0	85.3	11.4	26.7
Queue Length 95th (m)	40.2	12.7	#142.2	m11.0	m31.9
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	445	516	1757	263	2241
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.35	0.83	0.54	0.62

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.

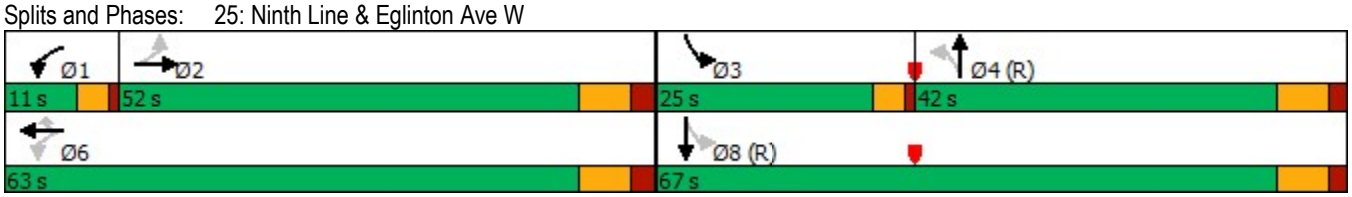
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	208	183	1267	190	142	1396
Future Volume (vph)	208	183	1267	190	142	1396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.5		4.0	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1748	1493	3474		1653	3579
Flt Permitted	0.95	1.00	1.00		0.10	1.00
Satd. Flow (perm)	1748	1493	3474		170	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	208	183	1267	190	142	1396
RTOR Reduction (vph)	0	149	14	0	0	0
Lane Group Flow (vph)	208	34	1443	0	142	1396
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	14.0	14.0	36.9		47.0	47.0
Effective Green, g (s)	14.0	14.0	36.9		47.0	47.0
Actuated g/C Ratio	0.19	0.19	0.49		0.63	0.63
Clearance Time (s)	6.5	6.5	7.5		4.0	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	326	278	1709		227	2242
v/s Ratio Prot			c0.42		0.05	c0.39
v/s Ratio Perm	c0.12	0.02			0.34	
v/c Ratio	0.64	0.12	0.84		0.63	0.62
Uniform Delay, d1	28.2	25.4	16.6		11.8	8.6
Progression Factor	1.00	1.00	1.00		2.06	0.41
Incremental Delay, d2	4.1	0.2	5.3		0.5	0.1
Delay (s)	32.2	25.6	21.9		24.8	3.6
Level of Service	C	C	C		C	A
Approach Delay (s)	29.1		21.9			5.6
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	37	612	99	264	256	23	757	400	1280
Future Volume (vph)	37	612	99	264	256	23	757	400	1280
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2	1	6			4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	4	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.0	32.5	32.5	40.0	40.0	11.0	40.0
Total Split (s)	52.0	52.0	11.0	63.0	63.0	42.0	42.0	25.0	67.0
Total Split (%)	40.0%	40.0%	8.5%	48.5%	48.5%	32.3%	32.3%	19.2%	51.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	44.5	44.5	59.0	55.5	55.5	35.0	35.0	63.0	60.0
Actuated g/C Ratio	0.34	0.34	0.45	0.43	0.43	0.27	0.27	0.48	0.46
v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.62	0.96	1.19	0.82
Control Delay	30.3	124.0	41.3	26.4	3.9	106.3	67.6	138.0	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	124.0	41.3	26.4	3.9	106.3	67.6	138.0	32.1
LOS	C	F	D	C	A	F	E	F	C
Approach Delay		119.5		19.4			68.5		56.3
Approach LOS		F		B			E		E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 26 (20%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 65.4	Intersection LOS: E
Intersection Capacity Utilization 113.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	37	730	99	264	256	23	894	400	1347
v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.62	0.96	1.19	0.82
Control Delay	30.3	124.0	41.3	26.4	3.9	106.3	67.6	138.0	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	124.0	41.3	26.4	3.9	106.3	67.6	138.0	32.1
Queue Length 50th (m)	5.9	~201.8	13.3	40.9	0.0	4.8	108.2	~96.3	143.2
Queue Length 95th (m)	13.6	#270.6	#29.2	60.5	14.3	#19.7	#146.5	#154.2	171.5
Internal Link Dist (m)		373.3		388.7			291.0		254.2
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	358	634	153	796	778	37	930	337	1644
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.62	0.96	1.19	0.82

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	612	118	99	264	256	23	757	137	400	1280	67
Future Volume (vph)	37	612	118	99	264	256	23	757	137	400	1280	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1837		1733	1865	1479	1069	3414		1716	3555	
Flt Permitted	0.60	1.00		0.08	1.00	1.00	0.12	1.00		0.10	1.00	
Satd. Flow (perm)	1047	1837		150	1865	1479	140	3414		185	3555	
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)	37	612	118	99	264	256	23	757	137	400	1280	67
RTOR Reduction (vph)	0	5	0	0	0	147	0	12	0	0	3	0
Lane Group Flow (vph)	37	725	0	99	264	109	23	882	0	400	1344	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Effective Green, g (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Actuated g/C Ratio	0.34	0.34		0.43	0.43	0.43	0.27	0.27		0.46	0.46	
Clearance Time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	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)	358	628		149	796	631	37	919		332	1640	
v/s Ratio Prot		c0.39		c0.04	0.14			0.26		c0.19	0.38	
v/s Ratio Perm	0.04			0.25		0.07	0.16			c0.36		
v/c Ratio	0.10	1.15		0.66	0.33	0.17	0.62	0.96		1.20	0.82	
Uniform Delay, d1	29.1	42.8		30.7	24.9	23.1	41.7	46.8		40.3	30.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.06	0.94	
Incremental Delay, d2	0.6	86.5		10.6	1.1	0.6	59.3	21.5		109.7	3.1	
Delay (s)	29.7	129.3		41.3	26.0	23.6	101.0	68.3		152.6	31.8	
Level of Service	C	F		D	C	C	F	E		F	C	
Approach Delay (s)		124.5			27.5			69.1			59.4	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	69.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	48	1267	48	1572
Future Volume (vph)	48	1267	48	1572
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	24.0	24.0	24.0
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.2	47.3	47.3	47.3
Actuated g/C Ratio	0.14	0.73	0.73	0.73
v/c Ratio	0.50	0.53	0.22	0.60
Control Delay	23.4	2.6	8.2	7.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.4	2.6	8.2	7.5
LOS	C	A	A	A
Approach Delay	23.4	2.6		7.5
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 32 (49%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 61.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	1342	48	1572
v/c Ratio	0.50	0.53	0.22	0.60
Control Delay	23.4	2.6	8.2	7.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.4	2.6	8.2	7.5
Queue Length 50th (m)	9.8	10.3	1.7	43.2
Queue Length 95th (m)	21.4	14.4	7.4	75.8
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	506	2554	222	2605
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.53	0.22	0.60

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	93	1267	75	48	1572
Future Volume (vph)	48	93	1267	75	48	1572
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1709		3503		1684	3579
Flt Permitted	0.98		1.00		0.17	1.00
Satd. Flow (perm)	1709		3503		305	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	93	1267	75	48	1572
RTOR Reduction (vph)	40	0	4	0	0	0
Lane Group Flow (vph)	101	0	1338	0	48	1572
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	8.1		44.9		44.9	44.9
Effective Green, g (s)	8.1		44.9		44.9	44.9
Actuated g/C Ratio	0.12		0.69		0.69	0.69
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	212		2419		210	2472
v/s Ratio Prot	c0.06		0.38			c0.44
v/s Ratio Perm					0.16	
v/c Ratio	0.48		0.55		0.23	0.64
Uniform Delay, d1	26.5		5.0		3.7	5.5
Progression Factor	1.00		0.36		1.00	1.00
Incremental Delay, d2	1.7		0.8		2.5	1.3
Delay (s)	28.2		2.6		6.2	6.8
Level of Service	C		A		A	A
Approach Delay (s)	28.2		2.6			6.8
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	142	75	1039	108	1646
Future Volume (vph)	142	75	1039	108	1646
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	23.0	23.0	31.0	11.0	42.0
Total Split (%)	35.4%	35.4%	47.7%	16.9%	64.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.8	10.8	36.6	46.6	45.8
Actuated g/C Ratio	0.17	0.17	0.56	0.72	0.70
v/c Ratio	0.48	0.23	0.58	0.28	0.65
Control Delay	29.7	8.1	30.4	6.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	8.1	30.4	6.8	5.8
LOS	C	A	C	A	A
Approach Delay	22.2		30.4		5.8
Approach LOS	C		C		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 3 (5%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	142	75	1116	108	1646
v/c Ratio	0.48	0.23	0.58	0.28	0.65
Control Delay	29.7	8.1	30.4	6.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	8.1	30.4	6.8	5.8
Queue Length 50th (m)	14.6	0.0	108.5	2.6	27.3
Queue Length 95th (m)	26.3	8.1	150.5	m5.9	41.1
Internal Link Dist (m)	358.4		271.4		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	448	461	1924	389	2521
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.16	0.58	0.28	0.65

Intersection Summary

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

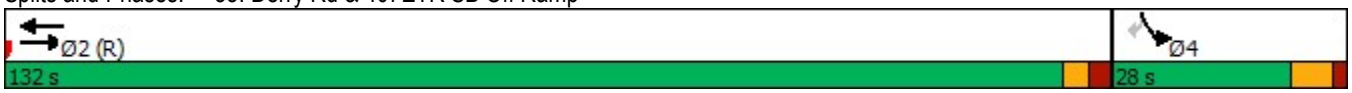
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	142	75	1039	77	108	1646
Future Volume (vph)	142	75	1039	77	108	1646
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3409		1785	3579
Flt Permitted	0.95	1.00	1.00		0.16	1.00
Satd. Flow (perm)	1765	1597	3409		308	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	75	1039	77	108	1646
RTOR Reduction (vph)	0	64	7	0	0	0
Lane Group Flow (vph)	142	11	1109	0	108	1646
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	9.2	9.2	33.3		43.3	43.3
Effective Green, g (s)	9.2	9.2	33.3		43.3	43.3
Actuated g/C Ratio	0.14	0.14	0.51		0.67	0.67
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	249	226	1746		341	2384
v/s Ratio Prot			0.33		0.03	c0.46
v/s Ratio Perm	c0.08	0.01			0.18	
v/c Ratio	0.57	0.05	0.64		0.32	0.69
Uniform Delay, d1	26.1	24.1	11.5		5.6	6.7
Progression Factor	1.00	1.00	2.30		1.21	0.59
Incremental Delay, d2	3.1	0.1	1.7		0.5	1.4
Delay (s)	29.2	24.2	28.0		7.2	5.4
Level of Service	C	C	C		A	A
Approach Delay (s)	27.5		28.0			5.5
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1923	904	54	46
Future Volume (vph)	1923	904	54	46
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	132.0	132.0	28.0	28.0
Total Split (%)	82.5%	82.5%	17.5%	17.5%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	142.6	142.6	8.4	8.4
Actuated g/C Ratio	0.89	0.89	0.05	0.05
v/c Ratio	0.60	0.29	0.33	0.41
Control Delay	3.6	2.0	78.1	29.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	2.0	78.1	29.0
LOS	A	A	E	C
Approach Delay	3.6	2.0	55.5	
Approach LOS	A	A	E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 69.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1923	904	54	46
v/c Ratio	0.60	0.29	0.33	0.41
Control Delay	3.6	2.0	78.1	29.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	2.0	78.1	29.0
Queue Length 50th (m)	63.6	18.9	8.0	0.0
Queue Length 95th (m)	84.4	26.1	14.8	12.4
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	3221	3128	413	211
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.29	0.13	0.22

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1923	904	0	54	46
Future Volume (vph)	0	1923	904	0	54	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1923	904	0	54	46
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	0	1923	904	0	54	2
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		140.0	140.0		7.0	7.0
Effective Green, g (s)		140.0	140.0		7.0	7.0
Actuated g/C Ratio		0.88	0.88		0.04	0.04
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3162	3071		137	57
v/s Ratio Prot		c0.53	0.26		c0.02	
v/s Ratio Perm						0.00
v/c Ratio		0.61	0.29		0.39	0.04
Uniform Delay, d1		2.7	1.7		74.4	73.3
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.9	0.2		1.9	0.3
Delay (s)		3.6	1.9		76.3	73.5
Level of Service		A	A		E	E
Approach Delay (s)		3.6	1.9		75.0	
Approach LOS		A	A		E	

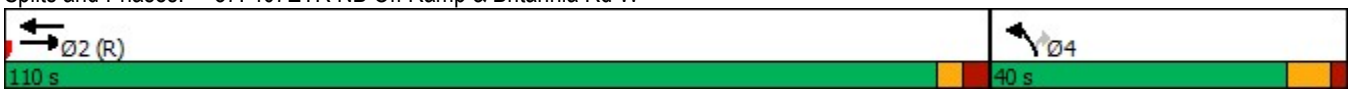
Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1648	1032	69	191
Future Volume (vph)	1648	1032	69	191
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	110.0	110.0	40.0	40.0
Total Split (%)	73.3%	73.3%	26.7%	26.7%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	117.3	117.3	19.7	19.7
Actuated g/C Ratio	0.78	0.78	0.13	0.13
v/c Ratio	0.58	0.37	0.33	0.78
Control Delay	8.2	5.9	61.3	68.7
Queue Delay	0.3	0.3	0.0	0.0
Total Delay	8.5	6.2	61.3	68.7
LOS	A	A	E	E
Approach Delay	8.5	6.2	66.7	
Approach LOS	A	A	E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 57.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1648	1032	69	191
v/c Ratio	0.58	0.37	0.33	0.78
Control Delay	8.2	5.9	61.3	68.7
Queue Delay	0.3	0.3	0.0	0.0
Total Delay	8.5	6.2	61.3	68.7
Queue Length 50th (m)	82.8	39.6	17.4	39.6
Queue Length 95th (m)	125.8	61.8	29.8	61.3
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2826	2799	353	379
Starvation Cap Reductn	514	1030	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.58	0.20	0.50

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1648	0	0	1032	69	191
Future Volume (vph)	1648	0	0	1032	69	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1648	0	0	1032	69	191
RTOR Reduction (vph)	0	0	0	0	0	39
Lane Group Flow (vph)	1648	0	0	1032	69	152
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	117.3			117.3	19.7	19.7
Effective Green, g (s)	117.3			117.3	19.7	19.7
Actuated g/C Ratio	0.78			0.78	0.13	0.13
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2826			2798	211	205
v/s Ratio Prot	c0.46			0.29	0.04	
v/s Ratio Perm						c0.10
v/c Ratio	0.58			0.37	0.33	0.74
Uniform Delay, d1	6.6			5.0	59.1	62.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.4	0.9	13.4
Delay (s)	7.4			5.4	60.0	76.1
Level of Service	A			A	E	E
Approach Delay (s)	7.4			5.4	71.9	
Approach LOS	A			A	E	

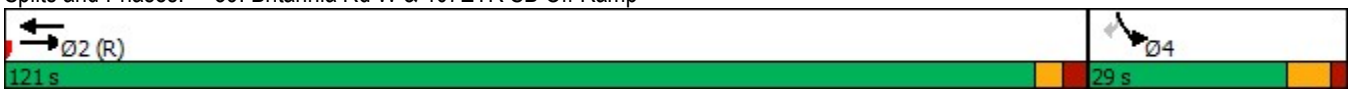
Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1763	965	70	63
Future Volume (vph)	1763	965	70	63
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	121.0	121.0	29.0	29.0
Total Split (%)	80.7%	80.7%	19.3%	19.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	125.4	125.4	11.6	11.6
Actuated g/C Ratio	0.84	0.84	0.08	0.08
v/c Ratio	0.58	0.32	0.54	0.42
Control Delay	5.1	3.3	81.0	22.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.1	3.3	81.0	22.2
LOS	A	A	F	C
Approach Delay	5.1	3.3	53.1	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1763	965	70	63
v/c Ratio	0.58	0.32	0.54	0.42
Control Delay	5.1	3.3	81.0	22.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.1	3.3	81.0	22.2
Queue Length 50th (m)	65.7	25.1	18.8	0.0
Queue Length 95th (m)	94.3	37.4	33.0	13.2
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	3021	2992	246	231
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.32	0.28	0.27

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1763	965	0	70	63
Future Volume (vph)	0	1763	965	0	70	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1763	965	0	70	63
RTOR Reduction (vph)	0	0	0	0	0	58
Lane Group Flow (vph)	0	1763	965	0	70	5
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		125.4	125.4		11.6	11.6
Effective Green, g (s)		125.4	125.4		11.6	11.6
Actuated g/C Ratio		0.84	0.84		0.08	0.08
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3021	2992		130	93
v/s Ratio Prot		c0.49	0.27		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.58	0.32		0.54	0.05
Uniform Delay, d1		3.9	2.8		66.6	64.1
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8	0.3		4.2	0.2
Delay (s)		4.8	3.0		70.9	64.3
Level of Service		A	A		E	E
Approach Delay (s)		4.8	3.0		67.8	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	116	5	5	5	100	957	2	1617
Future Volume (vph)	116	5	5	5	100	957	2	1617
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.0	24.0	24.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	40.0	40.0	40.0	40.0
Total Split (%)	38.5%	38.5%	38.5%	38.5%	61.5%	61.5%	61.5%	61.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	16.0	16.0	16.0	16.0	40.0	40.0	40.0	40.0
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.62	0.62	0.62	0.62
v/c Ratio	0.34	0.72	0.03	0.04	0.88	0.45	0.01	0.77
Control Delay	21.8	31.3	16.6	10.7	80.6	14.8	10.5	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	31.3	16.6	10.7	80.6	14.8	10.5	14.4
LOS	C	C	B	B	F	B	B	B
Approach Delay		28.6		12.0		21.1		14.4
Approach LOS		C		B		C		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 61: Ninth Line & Skyview Access/Skyview Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	290	5	17	100	959	2	1659
v/c Ratio	0.34	0.72	0.03	0.04	0.88	0.45	0.01	0.77
Control Delay	21.8	31.3	16.6	10.7	80.6	14.8	10.5	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	31.3	16.6	10.7	80.6	14.8	10.5	14.4
Queue Length 50th (m)	10.5	27.2	0.4	0.4	17.5	101.9	0.1	56.4
Queue Length 95th (m)	20.0	44.7	2.3	3.7	m#31.9	m112.1	m0.2	#80.9
Internal Link Dist (m)		156.7		171.6		254.2		164.6
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	433	508	234	527	113	2155	293	2149
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	0.27	0.57	0.02	0.03	0.88	0.45	0.01	0.77

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	5	285	5	5	12	100	957	2	2	1617	42
Future Volume (vph)	116	5	285	5	5	12	100	957	2	2	1617	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1571		1750	1647		1750	3499		1750	3487	
Flt Permitted	0.75	1.00		0.40	1.00		0.10	1.00		0.26	1.00	
Satd. Flow (perm)	1375	1571		743	1647		184	3499		478	3487	
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)	116	5	285	5	5	12	100	957	2	2	1617	42
RTOR Reduction (vph)	0	14	0	0	9	0	0	0	0	0	2	0
Lane Group Flow (vph)	116	276	0	5	8	0	100	959	0	2	1657	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		40.0	40.0		40.0	40.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.62	0.62		0.62	0.62	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	338	386		182	405		113	2153		294	2145	
v/s Ratio Prot		c0.18			0.00			0.27			0.48	
v/s Ratio Perm	0.08			0.01			c0.54			0.00		
v/c Ratio	0.34	0.71		0.03	0.02		0.88	0.45		0.01	0.77	
Uniform Delay, d1	20.2	22.4		18.6	18.6		10.6	6.6		4.8	9.2	
Progression Factor	1.00	1.00		1.00	1.00		3.01	2.00		1.58	1.12	
Incremental Delay, d2	0.6	6.2		0.1	0.0		41.7	0.4		0.0	2.2	
Delay (s)	20.8	28.6		18.7	18.6		73.5	13.7		7.7	12.5	
Level of Service	C	C		B	B		E	B		A	B	
Approach Delay (s)		26.3			18.6			19.3			12.5	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	0	42	46	0	68	10	1147	36	30	1012	39
Future Volume (Veh/h)	29	0	42	46	0	68	10	1147	36	30	1012	39
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)	29	0	42	46	0	68	10	1147	36	30	1012	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.79	0.79		0.79	0.79	0.79				0.79		
vC, conflicting volume	1753	2294	526	1793	2296	592	1051			1183		
vC1, stage 1 conf vol	1092	1092		1185	1185							
vC2, stage 2 conf vol	662	1203		608	1111							
vCu, unblocked vol	1422	2107	526	1472	2109	0	1051			700		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	92	81	100	92	98			96		
cM capacity (veh/h)	207	200	497	243	203	862	658			700		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	42	114	10	765	418	30	675	376
Volume Left	29	0	46	10	0	0	30	0	0
Volume Right	0	42	68	0	0	36	0	0	39
cSH	207	497	425	658	1700	1700	700	1700	1700
Volume to Capacity	0.14	0.08	0.27	0.02	0.45	0.25	0.04	0.40	0.22
Queue Length 95th (m)	3.4	1.9	7.5	0.3	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	25.2	12.9	16.5	10.6	0.0	0.0	10.4	0.0	0.0
Lane LOS	D	B	C	B			B		
Approach Delay (s)	17.9		16.5	0.1			0.3		
Approach LOS	C		C						

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	46	1368	69	34	1494
Future Volume (Veh/h)	52	46	1368	69	34	1494
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)	52	46	1368	69	34	1494
Pedestrians			1			
Lane Width (m)			3.7			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						365
pX, platoon unblocked	0.73					
vC, conflicting volume	2218	718			1437	
vC1, stage 1 conf vol	1402					
vC2, stage 2 conf vol	816					
vCu, unblocked vol	1933	718			1437	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	88			93	
cM capacity (veh/h)	185	369			479	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	98	912	525	34	747	747
Volume Left	52	0	0	34	0	0
Volume Right	46	0	69	0	0	0
cSH	242	1700	1700	479	1700	1700
Volume to Capacity	0.41	0.54	0.31	0.07	0.44	0.44
Queue Length 95th (m)	13.0	0.0	0.0	1.6	0.0	0.0
Control Delay (s)	29.7	0.0	0.0	13.1	0.0	0.0
Lane LOS	D			B		
Approach Delay (s)	29.7	0.0		0.3		
Approach LOS	D					

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	38	11	1083	1784	6
Future Volume (Veh/h)	21	38	11	1083	1784	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)	21	38	11	1083	1784	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				189	295	
pX, platoon unblocked	0.72	0.65	0.65			
vC, conflicting volume	2350	895	1790			
vC1, stage 1 conf vol	1787					
vC2, stage 2 conf vol	564					
vCu, unblocked vol	1222	0	1141			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	95	97			
cM capacity (veh/h)	170	706	396			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	21	38	11	542	542	1189	601
Volume Left	21	0	11	0	0	0	0
Volume Right	0	38	0	0	0	0	6
cSH	170	706	396	1700	1700	1700	1700
Volume to Capacity	0.12	0.05	0.03	0.32	0.32	0.70	0.35
Queue Length 95th (m)	2.9	1.2	0.6	0.0	0.0	0.0	0.0
Control Delay (s)	29.2	10.4	14.4	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	17.1		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	8	2	1430	946	18
Future Volume (Veh/h)	20	8	2	1430	946	18
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)	20	8	2	1430	946	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				398	201	
pX, platoon unblocked	0.85	0.91	0.91			
vC, conflicting volume	1674	482	964			
vC1, stage 1 conf vol	955					
vC2, stage 2 conf vol	719					
vCu, unblocked vol	958	236	765			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	363	698	769			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	20	8	479	953	631	333
Volume Left	20	0	2	0	0	0
Volume Right	0	8	0	0	0	18
cSH	363	698	769	1700	1700	1700
Volume to Capacity	0.06	0.01	0.00	0.56	0.37	0.20
Queue Length 95th (m)	1.2	0.2	0.1	0.0	0.0	0.0
Control Delay (s)	15.5	10.2	0.1	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	14.0		0.0		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	15	9	1303	981	16
Future Volume (Veh/h)	42	15	9	1303	981	16
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)	42	15	9	1303	981	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					397	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1658	498	997			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1560	315	850			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	56	98	99			
cM capacity (veh/h)	95	635	730			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	15	9	652	652	654	343
Volume Left	42	0	9	0	0	0	0
Volume Right	0	15	0	0	0	0	16
cSH	95	635	730	1700	1700	1700	1700
Volume to Capacity	0.44	0.02	0.01	0.38	0.38	0.38	0.20
Queue Length 95th (m)	13.0	0.5	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	70.3	10.8	10.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	A				
Approach Delay (s)	54.7		0.1			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	199	813	230	1737	260	658	200	56	560
Future Volume (vph)	199	813	230	1737	260	658	200	56	560
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA
Protected Phases	5	2	1	6	7	4			8
Permitted Phases	2		6		4		4	8	
Detector Phase	5	2	1	6	7	4	4	8	8
Switch Phase									
Minimum Initial (s)	7.0	8.0	7.0	8.0	7.0	8.0	8.0	8.0	8.0
Minimum Split (s)	11.0	30.1	11.0	30.1	11.0	29.4	29.4	29.4	29.4
Total Split (s)	12.0	56.0	19.0	63.0	16.0	55.0	55.0	39.0	39.0
Total Split (%)	9.2%	43.1%	14.6%	48.5%	12.3%	42.3%	42.3%	30.0%	30.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.1	1.0	2.1	1.0	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	4.0	6.1	4.0	6.4	6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	60.6	50.5	71.0	56.9	51.0	48.6	48.6	32.6	32.6
Actuated g/C Ratio	0.47	0.39	0.55	0.44	0.39	0.37	0.37	0.25	0.25
v/c Ratio	1.18	0.89	0.90	1.13	1.16	0.93	0.30	0.98	0.95
Control Delay	158.2	44.4	69.1	102.1	146.2	53.3	9.4	164.6	64.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.2	44.4	69.1	102.1	146.2	53.3	9.4	164.6	64.1
LOS	F	D	E	F	F	D	A	F	E
Approach Delay		60.5		98.3		67.1			70.2
Approach LOS		E		F		E			E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 77.4	Intersection LOS: E
Intersection Capacity Utilization 120.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	199	1213	230	1782	260	658	200	56	875
v/c Ratio	1.18	0.89	0.90	1.13	1.16	0.93	0.30	0.98	0.95
Control Delay	158.2	44.4	69.1	102.1	146.2	53.3	9.4	164.6	64.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.2	44.4	69.1	102.1	146.2	53.3	9.4	164.6	64.1
Queue Length 50th (m)	~41.9	133.7	39.0	~257.1	~59.0	114.2	10.5	13.2	99.3
Queue Length 95th (m)	#86.7	#166.3	#80.7	#296.3	#109.8	#208.6	27.4	#39.2	#136.7
Internal Link Dist (m)		119.7		244.5		681.0			237.0
Turn Bay Length (m)	80.0		80.0		130.0			95.0	
Base Capacity (vph)	168	1361	262	1576	224	711	675	57	917
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.89	0.88	1.13	1.16	0.93	0.30	0.98	0.95

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	813	400	230	1737	45	260	658	200	56	560	315
Future Volume (vph)	199	813	400	230	1737	45	260	658	200	56	560	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1		4.0	6.1		4.0	6.4	6.4	6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1767	3384		1767	3599		1767	1902	1560	1785	3419	
Flt Permitted	0.08	1.00		0.07	1.00		0.11	1.00	1.00	0.12	1.00	
Satd. Flow (perm)	147	3384		137	3599		203	1902	1560	231	3419	
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)	199	813	400	230	1737	45	260	658	200	56	560	315
RTOR Reduction (vph)	0	46	0	0	1	0	0	0	93	0	60	0
Lane Group Flow (vph)	199	1167	0	230	1781	0	260	658	107	56	815	0
Confl. Peds. (#/hr)			2	2					1	1		
Heavy Vehicles (%)	1%	3%	0%	1%	1%	2%	1%	1%	1%	0%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		
Actuated Green, G (s)	58.5	50.5		68.9	56.9		48.6	48.6	48.6	32.6	32.6	
Effective Green, g (s)	58.5	50.5		68.9	56.9		48.6	48.6	48.6	32.6	32.6	
Actuated g/C Ratio	0.45	0.39		0.53	0.44		0.37	0.37	0.37	0.25	0.25	
Clearance Time (s)	4.0	6.1		4.0	6.1		4.0	6.4	6.4	6.4	6.4	
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)	165	1314		253	1575		220	711	583	57	857	
v/s Ratio Prot	c0.07	0.34		c0.10	0.49		c0.11	0.35			0.24	
v/s Ratio Perm	c0.47			0.38			c0.33		0.07	0.24		
v/c Ratio	1.21	0.89		0.91	1.13		1.18	0.93	0.18	0.98	0.95	
Uniform Delay, d1	34.1	37.1		38.6	36.5		35.5	39.0	27.4	48.4	47.9	
Progression Factor	1.00	1.00		1.00	1.00		1.38	0.88	1.00	1.00	1.00	
Incremental Delay, d2	136.2	9.2		33.1	67.4		116.0	18.5	0.6	114.3	20.9	
Delay (s)	170.3	46.3		71.6	104.0		164.9	52.6	28.0	162.7	68.8	
Level of Service	F	D		E	F		F	D	C	F	E	
Approach Delay (s)		63.8			100.3			74.3			74.5	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	81.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	120.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	111	1028	51	1214
Future Volume (vph)	111	1028	51	1214
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	22.5	22.5	22.5
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	10.2	44.3	44.3	44.3
Actuated g/C Ratio	0.16	0.68	0.68	0.68
v/c Ratio	0.55	0.47	0.18	0.50
Control Delay	25.6	2.5	4.2	4.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	2.5	4.2	4.0
LOS	C	A	A	A
Approach Delay	25.6	2.5		4.0
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 42 (65%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 4.7	Intersection LOS: A
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	165	1115	51	1214
v/c Ratio	0.55	0.47	0.18	0.50
Control Delay	25.6	2.5	4.2	4.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	2.5	4.2	4.0
Queue Length 50th (m)	13.1	9.3	2.0	25.7
Queue Length 95th (m)	25.7	14.2	m2.5	m40.2
Internal Link Dist (m)	168.5	202.8		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	507	2377	287	2417
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.47	0.18	0.50

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	111	54	1028	87	51	1214
Future Volume (vph)	111	54	1028	87	51	1214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.96		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1736		3476		1785	3544
Flt Permitted	0.97		1.00		0.22	1.00
Satd. Flow (perm)	1736		3476		420	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	54	1028	87	51	1214
RTOR Reduction (vph)	31	0	7	0	0	0
Lane Group Flow (vph)	134	0	1108	0	51	1214
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases	8				6	
Actuated Green, G (s)	10.2		44.3		44.3	44.3
Effective Green, g (s)	10.2		44.3		44.3	44.3
Actuated g/C Ratio	0.16		0.68		0.68	0.68
Clearance Time (s)	6.0		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	272		2369		286	2415
v/s Ratio Prot	c0.08		0.32			c0.34
v/s Ratio Perm					0.12	
v/c Ratio	0.49		0.47		0.18	0.50
Uniform Delay, d1	25.0		4.8		3.8	5.0
Progression Factor	1.00		0.34		0.72	0.66
Incremental Delay, d2	1.4		0.6		0.6	0.4
Delay (s)	26.4		2.3		3.3	3.7
Level of Service	C		A		A	A
Approach Delay (s)	26.4		2.3			3.7
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	79	8	147	13	52	982	157	1223
Future Volume (vph)	79	8	147	13	52	982	157	1223
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	5.0	5.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	25.0	25.0
Total Split (s)	22.5	22.5	22.5	22.5	42.5	42.5	42.5	42.5
Total Split (%)	34.6%	34.6%	34.6%	34.6%	65.4%	65.4%	65.4%	65.4%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	1.0	1.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	4.5	4.5	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	10.8	10.8	12.8	12.8	40.7	40.7	40.7	40.7
Actuated g/C Ratio	0.17	0.17	0.20	0.20	0.63	0.63	0.63	0.63
v/c Ratio	0.38	0.14	0.54	0.30	0.25	0.48	0.57	0.57
Control Delay	28.5	11.2	30.7	8.5	10.6	7.7	12.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	11.2	30.7	8.5	10.6	7.7	12.0	3.7
LOS	C	B	C	A	B	A	B	A
Approach Delay		22.7		20.8		7.8		4.6
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 9 (14%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 72.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: Street F/Doug Leavens Blvd & Ninth Line

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	79	40	147	119	52	1092	157	1276
v/c Ratio	0.38	0.14	0.54	0.30	0.25	0.48	0.57	0.57
Control Delay	28.5	11.2	30.7	8.5	10.6	7.7	12.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	11.2	30.7	8.5	10.6	7.7	12.0	3.7
Queue Length 50th (m)	8.0	0.8	15.0	1.7	2.1	27.4	3.2	13.2
Queue Length 95th (m)	16.6	6.5	26.7	11.2	9.1	49.1	23.4	16.5
Internal Link Dist (m)		122.6		392.7		51.3		348.4
Turn Bay Length (m)			25.0		15.0		80.0	
Base Capacity (vph)	308	423	380	522	205	2262	274	2253
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	0.26	0.09	0.39	0.23	0.25	0.48	0.57	0.57

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	8	32	147	13	106	52	982	110	157	1223	53
Future Volume (vph)	79	8	32	147	13	106	52	982	110	157	1223	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		4.5	4.5		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	0.95	
Frt	1.00	0.88		1.00	0.87		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1621		1785	1624		1750	3595		1785	3590	
Flt Permitted	0.68	1.00		0.73	1.00		0.18	1.00		0.23	1.00	
Satd. Flow (perm)	1254	1621		1373	1624		327	3595		438	3590	
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)	79	8	32	147	13	106	52	982	110	157	1223	53
RTOR Reduction (vph)	0	27	0	0	81	0	0	11	0	0	4	0
Lane Group Flow (vph)	79	13	0	147	38	0	52	1081	0	157	1272	0
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	10.8	10.8		12.8	12.8		40.7	40.7		40.7	40.7	
Effective Green, g (s)	10.8	10.8		12.8	12.8		40.7	40.7		40.7	40.7	
Actuated g/C Ratio	0.17	0.17		0.20	0.20		0.63	0.63		0.63	0.63	
Clearance Time (s)	6.5	6.5		4.5	4.5		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)	208	269		270	319		204	2251		274	2247	
v/s Ratio Prot		0.01			0.02			0.30			0.35	
v/s Ratio Perm	0.06			c0.11			0.16			c0.36		
v/c Ratio	0.38	0.05		0.54	0.12		0.25	0.48		0.57	0.57	
Uniform Delay, d1	24.1	22.8		23.5	21.5		5.4	6.5		7.1	7.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.47	0.36	
Incremental Delay, d2	1.2	0.1		2.2	0.2		3.0	0.7		7.8	1.0	
Delay (s)	25.3	22.9		25.7	21.6		8.4	7.2		11.1	3.5	
Level of Service	C	C		C	C		A	A		B	A	
Approach Delay (s)		24.5			23.9			7.3			4.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	0	270	0	92	1246	40	1220
Future Volume (vph)	55	0	270	0	92	1246	40	1220
Turn Type	Perm	NA	D.Pm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		4		2		6	
Detector Phase	4	4	4	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.0	8.0
Minimum Split (s)	23.0	23.0	23.0	22.5	23.0	23.0	11.0	23.0
Total Split (s)	26.0	26.0	26.0	26.0	41.0	41.0	11.0	49.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	52.6%	52.6%	14.1%	62.8%
Yellow Time (s)	4.0	4.0	4.0	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.5	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	19.0	19.0	19.0	20.5	39.4	39.4	49.0	46.0
Actuated g/C Ratio	0.24	0.24	0.24	0.26	0.51	0.51	0.63	0.59
v/c Ratio	0.17	0.12	0.88	0.06	0.48	0.79	0.16	0.59
Control Delay	24.1	1.1	59.2	0.2	27.3	21.7	7.3	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	1.1	59.2	0.2	27.3	21.7	7.3	11.7
LOS	C	A	E	A	C	C	A	B
Approach Delay		12.6		53.0		22.0		11.5
Approach LOS		B		D		C		B

Intersection Summary	
Cycle Length: 78	
Actuated Cycle Length: 78	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 20.4	Intersection LOS: C
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	55	270	32	92	1429	40	1244
v/c Ratio	0.17	0.12	0.88	0.06	0.48	0.79	0.16	0.59
Control Delay	24.1	1.1	59.2	0.2	27.3	21.7	7.3	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	1.1	59.2	0.2	27.3	21.7	7.3	11.7
Queue Length 50th (m)	5.8	0.0	34.9	0.0	9.0	90.7	1.9	52.3
Queue Length 95th (m)	13.8	1.2	#71.5	0.0	#27.8	#132.7	5.0	68.7
Internal Link Dist (m)		132.1		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	347	484	321	588	191	1812	256	2123
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.11	0.84	0.05	0.48	0.79	0.16	0.59

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	55	270	0	32	92	1246	183	40	1220	24
Future Volume (vph)	55	0	55	270	0	32	92	1246	183	40	1220	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	4.5		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1653	1597		1750	3566		1785	3603	
Flt Permitted	0.74	1.00		0.72	1.00		0.21	1.00		0.10	1.00	
Satd. Flow (perm)	1356	1566		1255	1597		380	3566		180	3603	
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	0	55	270	0	32	92	1246	183	40	1220	24
RTOR Reduction (vph)	0	42	0	0	24	0	0	13	0	0	2	0
Lane Group Flow (vph)	55	13	0	270	8	0	92	1416	0	40	1242	0
Heavy Vehicles (%)	2%	2%	2%	8%	2%	0%	2%	0%	3%	0%	1%	2%
Turn Type	Perm	NA		D.Pm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	19.0	19.0		19.0	20.5		37.8	37.8		46.0	46.0	
Effective Green, g (s)	19.0	19.0		19.0	20.5		37.8	37.8		46.0	46.0	
Actuated g/C Ratio	0.24	0.24		0.24	0.26		0.48	0.48		0.59	0.59	
Clearance Time (s)	6.0	6.0		6.0	4.5		7.0	7.0		4.0	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)	330	381		305	419		184	1728		192	2124	
v/s Ratio Prot		0.01			0.01			c0.40		0.01	c0.34	
v/s Ratio Perm	0.04			c0.22			0.24			0.11		
v/c Ratio	0.17	0.04		0.89	0.02		0.50	0.82		0.21	0.58	
Uniform Delay, d1	23.3	22.5		28.4	21.3		13.7	17.2		11.4	10.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.0		24.8	0.0		9.4	4.5		0.5	1.2	
Delay (s)	23.5	22.5		53.3	21.3		23.1	21.7		11.9	11.2	
Level of Service	C	C		D	C		C	C		B	B	
Approach Delay (s)		23.0			49.9			21.7			11.2	
Approach LOS		C			D			C			B	

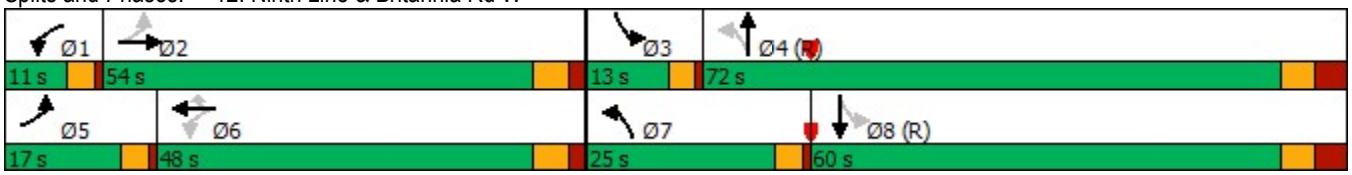
Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	277	695	92	1236	101	400	1077	83	1029
Future Volume (vph)	277	695	92	1236	101	400	1077	83	1029
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0
Minimum Split (s)	11.0	26.1	11.0	26.1	26.1	11.0	47.7	11.0	47.7
Total Split (s)	17.0	54.0	11.0	48.0	48.0	25.0	72.0	13.0	60.0
Total Split (%)	11.3%	36.0%	7.3%	32.0%	32.0%	16.7%	48.0%	8.7%	40.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.1	1.0	2.1	2.1	1.0	3.7	1.0	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	4.0	6.1	6.1	4.0	7.7	4.0	7.7
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	61.0	47.9	51.0	41.9	41.9	81.0	64.9	64.4	52.3
Actuated g/C Ratio	0.41	0.32	0.34	0.28	0.28	0.54	0.43	0.43	0.35
v/c Ratio	1.36	1.00	0.68	1.22	0.19	1.33	0.74	0.44	1.11
Control Delay	221.6	71.2	54.8	155.2	1.8	207.6	39.0	25.9	104.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	221.6	71.2	54.8	155.2	1.8	207.6	39.0	25.9	104.9
LOS	F	E	D	F	A	F	D	C	F
Approach Delay		100.1		137.9			82.2		100.4
Approach LOS		F		F			F		F

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.36	
Intersection Signal Delay: 104.6	Intersection LOS: F
Intersection Capacity Utilization 129.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	277	1164	92	1236	101	400	1160	83	1369
v/c Ratio	1.36	1.00	0.68	1.22	0.19	1.33	0.74	0.44	1.11
Control Delay	221.6	71.2	54.8	155.2	1.8	207.6	39.0	25.9	104.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	221.6	71.2	54.8	155.2	1.8	207.6	39.0	25.9	104.9
Queue Length 50th (m)	~84.6	155.5	15.7	~218.5	0.0	~127.3	138.5	10.7	~221.8
Queue Length 95th (m)	#138.1	#201.1	#32.5	#257.7	2.6	#187.8	163.1	18.7	#261.6
Internal Link Dist (m)		80.1		420.4			341.1		608.8
Turn Bay Length (m)	80.0		70.0		70.0	75.0		60.0	
Base Capacity (vph)	204	1167	135	1009	542	300	1563	194	1234
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.36	1.00	0.68	1.22	0.19	1.33	0.74	0.43	1.11

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.

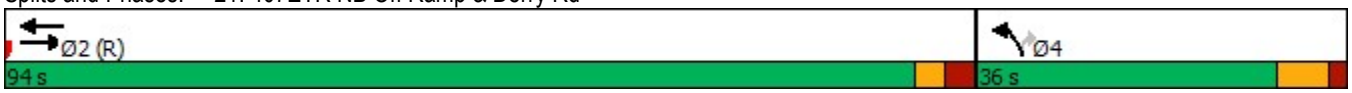
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	695	469	92	1236	101	400	1077	83	83	1029	340
Future Volume (vph)	277	695	469	92	1236	101	400	1077	83	83	1029	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1		4.0	6.1	6.1	4.0	7.7		4.0	7.7	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1767	3409		1785	3614	1551	1767	3607		1716	3479	
Flt Permitted	0.09	1.00		0.10	1.00	1.00	0.07	1.00		0.14	1.00	
Satd. Flow (perm)	162	3409		179	3614	1551	132	3607		244	3479	
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)	277	695	469	92	1236	101	400	1077	83	83	1029	340
RTOR Reduction (vph)	0	78	0	0	0	73	0	4	0	0	21	0
Lane Group Flow (vph)	277	1086	0	92	1236	28	400	1156	0	83	1348	0
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	3%	1%	0%	0%	4%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	58.9	47.9		48.9	41.9	41.9	77.3	64.9		60.7	52.3	
Effective Green, g (s)	58.9	47.9		48.9	41.9	41.9	77.3	64.9		60.7	52.3	
Actuated g/C Ratio	0.39	0.32		0.33	0.28	0.28	0.52	0.43		0.40	0.35	
Clearance Time (s)	4.0	6.1		4.0	6.1	6.1	4.0	7.7		4.0	7.7	
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)	202	1088		133	1009	433	296	1560		181	1213	
v/s Ratio Prot	c0.12	0.32		0.03	0.34		c0.19	0.32		0.03	0.39	
v/s Ratio Perm	c0.42			0.19		0.02	c0.50			0.16		
v/c Ratio	1.37	1.00		0.69	1.22	0.07	1.35	0.74		0.46	1.11	
Uniform Delay, d1	44.0	51.0		41.0	54.0	39.7	50.2	35.5		30.2	48.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	195.2	26.8		14.4	110.2	0.3	178.8	3.2		1.8	61.9	
Delay (s)	239.3	77.8		55.4	164.2	40.0	229.0	38.7		32.0	110.7	
Level of Service	F	E		E	F	D	F	D		C	F	
Approach Delay (s)		108.8			148.4			87.5			106.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	112.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.8
Intersection Capacity Utilization	129.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1157	2247	67	392
Future Volume (vph)	1157	2247	67	392
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	94.0	94.0	36.0	36.0
Total Split (%)	72.3%	72.3%	27.7%	27.7%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	88.0	88.0	29.0	29.0
Actuated g/C Ratio	0.68	0.68	0.22	0.22
v/c Ratio	0.48	0.92	0.09	0.88
Control Delay	10.8	25.6	40.5	56.5
Queue Delay	0.0	18.5	0.0	0.0
Total Delay	10.8	44.1	40.5	56.5
LOS	B	D	D	E
Approach Delay	10.8	44.1	54.2	
Approach LOS	B	D	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 35.3	Intersection LOS: D
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1157	2247	67	392
v/c Ratio	0.48	0.92	0.09	0.88
Control Delay	10.8	25.6	40.5	56.5
Queue Delay	0.0	18.5	0.0	0.0
Total Delay	10.8	44.1	40.5	56.5
Queue Length 50th (m)	63.0	219.2	6.4	66.4
Queue Length 95th (m)	75.8	260.7	12.2	#117.6
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2422	2446	749	444
Starvation Cap Reductn	0	273	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.48	1.03	0.09	0.88

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1157	0	0	2247	67	392
Future Volume (vph)	1157	0	0	2247	67	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3614	3362	1597
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3614	3362	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1157	0	0	2247	67	392
RTOR Reduction (vph)	0	0	0	0	0	89
Lane Group Flow (vph)	1157	0	0	2247	67	303
Heavy Vehicles (%)	2%	0%	0%	1%	3%	0%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	88.0			88.0	29.0	29.0
Effective Green, g (s)	88.0			88.0	29.0	29.0
Actuated g/C Ratio	0.68			0.68	0.22	0.22
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2422			2446	749	356
v/s Ratio Prot	0.32			c0.62	0.02	
v/s Ratio Perm						c0.19
v/c Ratio	0.48			0.92	0.09	0.85
Uniform Delay, d1	10.0			17.9	40.0	48.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			7.0	0.2	21.9
Delay (s)	10.7			24.9	40.3	70.4
Level of Service	B			C	D	E
Approach Delay (s)	10.7			24.9	66.0	
Approach LOS	B			C	E	

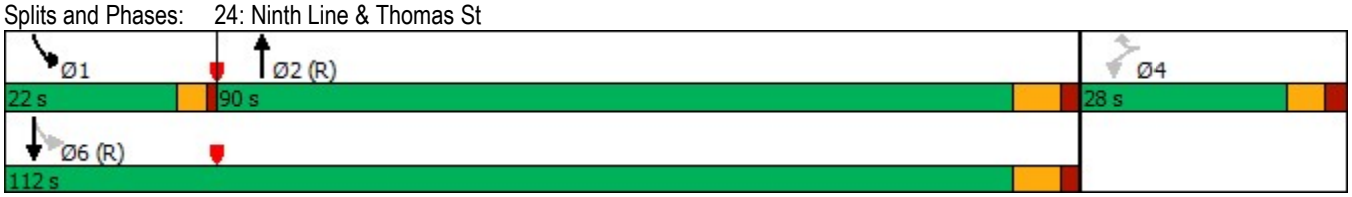
Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	167	277	1680	213	1281
Future Volume (vph)	167	277	1680	213	1281
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	28.0	28.0	90.0	22.0	112.0
Total Split (%)	20.0%	20.0%	64.3%	15.7%	80.0%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	17.9	17.9	89.0	111.6	108.6
Actuated g/C Ratio	0.13	0.13	0.64	0.80	0.78
v/c Ratio	0.75	0.73	0.81	0.83	0.46
Control Delay	79.3	26.2	13.8	61.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	26.2	13.8	61.5	6.4
LOS	E	C	B	E	A
Approach Delay	46.2		13.8		14.2
Approach LOS	D		B		B

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 96 (69%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 87.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	167	277	1842	213	1281
v/c Ratio	0.75	0.73	0.81	0.83	0.46
Control Delay	79.3	26.2	13.8	61.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	26.2	13.8	61.5	6.4
Queue Length 50th (m)	41.5	14.8	134.8	36.4	53.3
Queue Length 95th (m)	63.2	43.2	157.3	#69.1	70.0
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	267	414	2272	287	2777
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.63	0.67	0.81	0.74	0.46

Intersection Summary

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

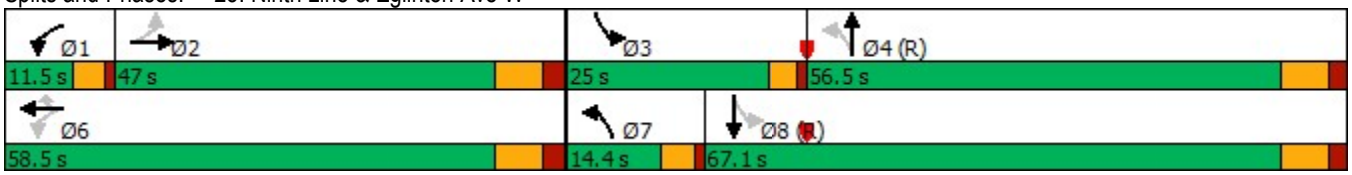
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	167	277	1680	162	213	1281
Future Volume (vph)	167	277	1680	162	213	1281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1744	1521	3569		1767	3579
Flt Permitted	0.95	1.00	1.00		0.05	1.00
Satd. Flow (perm)	1744	1521	3569		89	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	277	1680	162	213	1281
RTOR Reduction (vph)	0	187	5	0	0	0
Lane Group Flow (vph)	167	90	1837	0	213	1281
Confl. Peds. (#/hr)	6					
Heavy Vehicles (%)	1%	5%	1%	0%	1%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	17.9	17.9	88.9		108.6	108.6
Effective Green, g (s)	17.9	17.9	88.9		108.6	108.6
Actuated g/C Ratio	0.13	0.13	0.64		0.78	0.78
Clearance Time (s)	6.5	6.5	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	222	194	2266		257	2776
v/s Ratio Prot			0.51		c0.09	0.36
v/s Ratio Perm	c0.10	0.06			c0.55	
v/c Ratio	0.75	0.47	0.81		0.83	0.46
Uniform Delay, d1	58.9	56.6	19.2		45.1	5.5
Progression Factor	1.00	1.00	0.56		1.00	1.00
Incremental Delay, d2	13.4	1.8	2.1		19.3	0.6
Delay (s)	72.3	58.4	12.9		64.4	6.0
Level of Service	E	E	B		E	A
Approach Delay (s)	63.6		12.9			14.4
Approach LOS	E		B			B

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	54	554	133	694	537	103	1218	374	975
Future Volume (vph)	54	554	133	694	537	103	1218	374	975
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases		2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	11.0	40.0
Total Split (s)	47.0	47.0	11.5	58.5	58.5	14.4	56.5	25.0	67.1
Total Split (%)	33.6%	33.6%	8.2%	41.8%	41.8%	10.3%	40.4%	17.9%	47.9%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	39.5	39.5	54.0	51.0	51.0	60.9	49.5	77.5	61.1
Actuated g/C Ratio	0.28	0.28	0.39	0.36	0.36	0.44	0.35	0.55	0.44
v/c Ratio	1.02	1.16	0.93	1.00	0.72	0.42	1.12	1.17	0.65
Control Delay	179.7	135.0	91.5	79.1	23.6	21.6	105.7	138.3	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	179.7	135.0	91.5	79.1	23.6	21.6	105.7	138.3	37.5
LOS	F	F	F	E	C	C	F	F	D
Approach Delay		138.6		58.5			100.0		64.5
Approach LOS		F		E			F		E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 91 (65%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 83.6	Intersection LOS: F
Intersection Capacity Utilization 125.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	608	133	694	537	103	1410	374	1024
v/c Ratio	1.02	1.16	0.93	1.00	0.72	0.42	1.12	1.17	0.65
Control Delay	179.7	135.0	91.5	79.1	23.6	21.6	105.7	138.3	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	179.7	135.0	91.5	79.1	23.6	21.6	105.7	138.3	37.5
Queue Length 50th (m)	~14.0	~182.6	22.4	~177.0	58.2	12.1	~216.3	~94.4	139.4
Queue Length 95th (m)	#40.9	#249.7	#56.1	#252.2	99.3	20.7	#256.1 m	#146.4	159.2
Internal Link Dist (m)		373.3		388.7			291.0		249.3
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	53	525	143	692	748	261	1261	321	1569
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.16	0.93	1.00	0.72	0.39	1.12	1.17	0.65

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	554	54	133	694	537	103	1218	192	374	975	49
Future Volume (vph)	54	554	54	133	694	537	103	1218	192	374	975	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	1855		1750	1902	1566	1785	3540		1767	3590	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.19	1.00		0.07	1.00	
Satd. Flow (perm)	190	1855		167	1902	1566	365	3540		139	3590	
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)	54	554	54	133	694	537	103	1218	192	374	975	49
RTOR Reduction (vph)	0	2	0	0	0	178	0	9	0	0	3	0
Lane Group Flow (vph)	54	606	0	133	694	359	103	1401	0	374	1021	0
Heavy Vehicles (%)	0%	2%	4%	2%	1%	2%	0%	1%	1%	1%	1%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	39.5	39.5		51.0	51.0	51.0	58.4	49.5		74.5	61.1	
Effective Green, g (s)	39.5	39.5		51.0	51.0	51.0	58.4	49.5		74.5	61.1	
Actuated g/C Ratio	0.28	0.28		0.36	0.36	0.36	0.42	0.35		0.53	0.44	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	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)	53	523		139	692	570	242	1251		318	1566	
v/s Ratio Prot		c0.33		0.05	c0.36		0.03	0.40		c0.18	0.28	
v/s Ratio Perm	0.28			0.30		0.23	0.15			c0.45		
v/c Ratio	1.02	1.16		0.96	1.00	0.63	0.43	1.12		1.18	0.65	
Uniform Delay, d1	50.2	50.2		38.0	44.5	36.7	26.3	45.2		46.5	31.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.22	1.15	
Incremental Delay, d2	129.1	91.0		62.6	34.9	5.2	1.2	65.1		98.7	1.4	
Delay (s)	179.4	141.2		100.5	79.4	41.9	27.5	110.3		155.5	37.1	
Level of Service	F	F		F	E	D	C	F		F	D	
Approach Delay (s)		144.4			66.7			104.7			68.8	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	89.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	125.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	97	1751	56	1425
Future Volume (vph)	97	1751	56	1425
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	25.0	24.0	24.0	24.0
Total Split (s)	25.0	45.0	45.0	45.0
Total Split (%)	35.7%	64.3%	64.3%	64.3%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.2	45.8	45.8	45.8
Actuated g/C Ratio	0.17	0.65	0.65	0.65
v/c Ratio	0.59	0.78	0.53	0.61
Control Delay	31.6	4.1	25.6	6.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.6	4.1	25.6	6.3
LOS	C	A	C	A
Approach Delay	31.6	4.1		7.0
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 33 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	189	1822	56	1425
v/c Ratio	0.59	0.78	0.53	0.61
Control Delay	31.6	4.1	25.6	6.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.6	4.1	25.6	6.3
Queue Length 50th (m)	19.4	3.1	2.6	36.8
Queue Length 95th (m)	33.3	20.8	m#16.6	53.8
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	485	2330	106	2339
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.78	0.53	0.61

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.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	97	92	1751	71	56	1425
Future Volume (vph)	97	92	1751	71	56	1425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.93		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1750		3560		1785	3579
Flt Permitted	0.97		1.00		0.09	1.00
Satd. Flow (perm)	1750		3560		164	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	92	1751	71	56	1425
RTOR Reduction (vph)	12	0	3	0	0	0
Lane Group Flow (vph)	177	0	1819	0	56	1425
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.2		45.8		45.8	45.8
Effective Green, g (s)	12.2		45.8		45.8	45.8
Actuated g/C Ratio	0.17		0.65		0.65	0.65
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	305		2329		107	2341
v/s Ratio Prot			c0.51			0.40
v/s Ratio Perm	c0.10				0.34	
v/c Ratio	0.58		0.78		0.52	0.61
Uniform Delay, d1	26.5		8.6		6.4	7.0
Progression Factor	1.00		0.29		0.84	0.69
Incremental Delay, d2	2.7		1.2		15.5	1.1
Delay (s)	29.2		3.8		20.8	5.8
Level of Service	C		A		C	A
Approach Delay (s)	29.2		3.8			6.4
Approach LOS	C		A			A

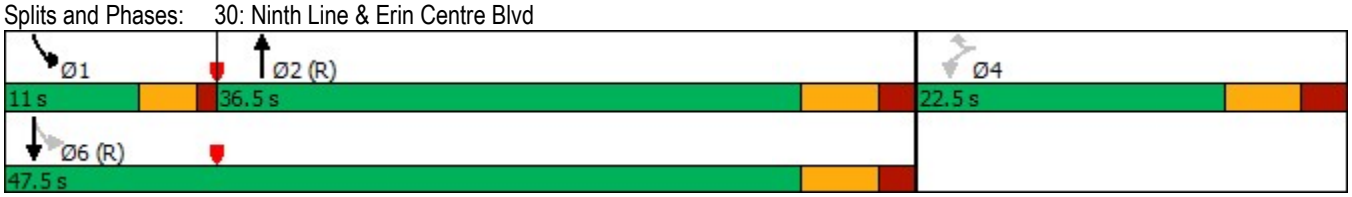
Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	114	158	1680	143	1322
Future Volume (vph)	114	158	1680	143	1322
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	22.5	22.5	36.5	11.0	47.5
Total Split (%)	32.1%	32.1%	52.1%	15.7%	67.9%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.2	10.2	37.8	49.3	47.3
Actuated g/C Ratio	0.15	0.15	0.54	0.70	0.68
v/c Ratio	0.44	0.43	0.93	0.47	0.54
Control Delay	32.3	8.8	28.3	17.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	8.8	28.3	17.7	4.8
LOS	C	A	C	B	A
Approach Delay	18.7		28.3		6.1
Approach LOS	B		C		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 69 (99%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 18.3	Intersection LOS: B
Intersection Capacity Utilization 78.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	114	158	1786	143	1322
v/c Ratio	0.44	0.43	0.93	0.47	0.54
Control Delay	32.3	8.8	28.3	17.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	8.8	28.3	17.7	4.8
Queue Length 50th (m)	12.9	0.0	142.4	8.1	16.1
Queue Length 95th (m)	24.2	12.4	#256.8	21.6	40.3
Internal Link Dist (m)	358.4		283.8		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	405	486	1924	303	2443
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.33	0.93	0.47	0.54

Intersection Summary

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

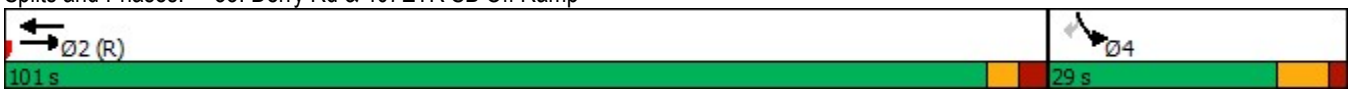
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	114	158	1680	106	143	1322
Future Volume (vph)	114	158	1680	106	143	1322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1776	1597	3556		1767	3614
Flt Permitted	0.95	1.00	1.00		0.10	1.00
Satd. Flow (perm)	1776	1597	3556		181	3614
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	114	158	1680	106	143	1322
RTOR Reduction (vph)	0	135	6	0	0	0
Lane Group Flow (vph)	114	23	1780	0	143	1322
Confl. Peds. (#/hr)	4			1	1	
Heavy Vehicles (%)	0%	0%	1%	11%	1%	1%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	10.2	10.2	37.0		47.3	47.3
Effective Green, g (s)	10.2	10.2	37.0		47.3	47.3
Actuated g/C Ratio	0.15	0.15	0.53		0.68	0.68
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	258	232	1879		265	2442
v/s Ratio Prot			c0.50		0.05	c0.37
v/s Ratio Perm	c0.06	0.01			0.32	
v/c Ratio	0.44	0.10	0.95		0.54	0.54
Uniform Delay, d1	27.3	25.9	15.6		13.6	5.8
Progression Factor	1.00	1.00	1.18		2.72	0.67
Incremental Delay, d2	1.2	0.2	10.1		1.7	0.7
Delay (s)	28.5	26.1	28.4		38.6	4.6
Level of Service	C	C	C		D	A
Approach Delay (s)	27.1		28.4			7.9
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1265	2214	361	180
Future Volume (vph)	1265	2214	361	180
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	101.0	101.0	29.0	29.0
Total Split (%)	77.7%	77.7%	22.3%	22.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	98.3	98.3	18.7	18.7
Actuated g/C Ratio	0.76	0.76	0.14	0.14
v/c Ratio	0.48	0.81	0.73	0.74
Control Delay	7.0	13.6	62.3	66.1
Queue Delay	0.0	0.6	0.0	0.0
Total Delay	7.0	14.2	62.3	66.1
LOS	A	B	E	E
Approach Delay	7.0	14.2	63.6	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1265	2214	361	180
v/c Ratio	0.48	0.81	0.73	0.74
Control Delay	7.0	13.6	62.3	66.1
Queue Delay	0.0	0.6	0.0	0.0
Total Delay	7.0	14.2	62.3	66.1
Queue Length 50th (m)	52.3	151.9	42.4	37.3
Queue Length 95th (m)	70.5	201.7	56.0	59.0
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	2654	2733	580	284
Starvation Cap Reductn	0	194	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.48	0.87	0.62	0.63

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1265	2214	0	361	180
Future Volume (vph)	0	1265	2214	0	361	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3510	3614		3429	1597
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3510	3614		3429	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1265	2214	0	361	180
RTOR Reduction (vph)	0	0	0	0	0	15
Lane Group Flow (vph)	0	1265	2214	0	361	165
Heavy Vehicles (%)	0%	4%	1%	0%	1%	0%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		98.3	98.3		18.7	18.7
Effective Green, g (s)		98.3	98.3		18.7	18.7
Actuated g/C Ratio		0.76	0.76		0.14	0.14
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2654	2732		493	229
v/s Ratio Prot		0.36	c0.61		c0.11	
v/s Ratio Perm						0.10
v/c Ratio		0.48	0.81		0.73	0.72
Uniform Delay, d1		6.0	10.0		53.3	53.2
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6	2.7		5.6	10.7
Delay (s)		6.7	12.7		58.8	63.9
Level of Service		A	B		E	E
Approach Delay (s)		6.7	12.7		60.5	
Approach LOS		A	B		E	

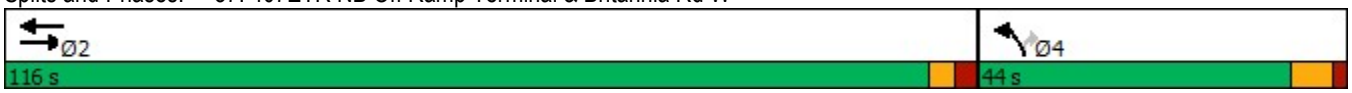
Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1419	1882	123	118
Future Volume (vph)	1419	1882	123	118
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	116.0	116.0	44.0	44.0
Total Split (%)	72.5%	72.5%	27.5%	27.5%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	None	None
Act Effct Green (s)	110.1	110.1	14.9	14.9
Actuated g/C Ratio	0.80	0.80	0.11	0.11
v/c Ratio	0.49	0.65	0.65	0.51
Control Delay	5.6	7.6	75.1	33.5
Queue Delay	0.2	1.1	0.0	0.0
Total Delay	5.8	8.7	75.1	33.5
LOS	A	A	E	C
Approach Delay	5.8	8.7	54.7	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 138	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 10.7	Intersection LOS: B
Intersection Capacity Utilization 69.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp Terminal & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1419	1882	123	118
v/c Ratio	0.49	0.65	0.65	0.51
Control Delay	5.6	7.6	75.1	33.5
Queue Delay	0.2	1.1	0.0	0.0
Total Delay	5.8	8.7	75.1	33.5
Queue Length 50th (m)	52.5	88.1	30.1	11.5
Queue Length 95th (m)	77.4	129.2	49.4	29.3
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2882	2882	469	474
Starvation Cap Reductn	549	683	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.86	0.26	0.25

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1419	0	0	1882	123	118
Future Volume (vph)	1419	0	0	1882	123	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3614	1750	1581
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3614	1750	1581
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1419	0	0	1882	123	118
RTOR Reduction (vph)	0	0	0	0	0	62
Lane Group Flow (vph)	1419	0	0	1882	123	56
Heavy Vehicles (%)	1%	0%	0%	1%	2%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	110.1			110.1	14.9	14.9
Effective Green, g (s)	110.1			110.1	14.9	14.9
Actuated g/C Ratio	0.80			0.80	0.11	0.11
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2883			2883	188	170
v/s Ratio Prot	0.39			c0.52	c0.07	
v/s Ratio Perm						0.04
v/c Ratio	0.49			0.65	0.65	0.33
Uniform Delay, d1	4.6			5.9	59.1	56.9
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.6			1.2	7.9	1.2
Delay (s)	5.2			7.1	67.0	58.1
Level of Service	A			A	E	E
Approach Delay (s)	5.2			7.1	62.6	
Approach LOS	A			A	E	

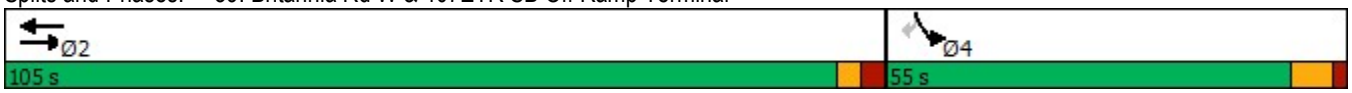
Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	138.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1412	1888	164	173
Future Volume (vph)	1412	1888	164	173
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	105.0	105.0	55.0	55.0
Total Split (%)	65.6%	65.6%	34.4%	34.4%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Max	Max
Act Effct Green (s)	88.5	88.5	48.3	48.3
Actuated g/C Ratio	0.59	0.59	0.32	0.32
v/c Ratio	0.66	0.88	0.29	0.34
Control Delay	22.1	32.1	41.9	39.1
Queue Delay	0.0	0.8	0.0	0.0
Total Delay	22.1	32.8	41.9	39.1
LOS	C	C	D	D
Approach Delay	22.1	32.8	40.5	
Approach LOS	C	C	D	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 149.9	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 29.4	Intersection LOS: C
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp Terminal



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1412	1888	164	173
v/c Ratio	0.66	0.88	0.29	0.34
Control Delay	22.1	32.1	41.9	39.1
Queue Delay	0.0	0.8	0.0	0.0
Total Delay	22.1	32.8	41.9	39.1
Queue Length 50th (m)	130.5	222.6	35.5	34.3
Queue Length 95th (m)	150.2	253.3	56.7	56.6
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2402	2402	569	506
Starvation Cap Reductn	0	227	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.87	0.29	0.34

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1412	1888	0	164	173
Future Volume (vph)	0	1412	1888	0	164	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3614		1767	1536
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3614		1767	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1412	1888	0	164	173
RTOR Reduction (vph)	0	0	0	0	0	12
Lane Group Flow (vph)	0	1412	1888	0	164	161
Heavy Vehicles (%)	0%	1%	1%	0%	1%	4%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		88.5	88.5		48.3	48.3
Effective Green, g (s)		88.5	88.5		48.3	48.3
Actuated g/C Ratio		0.59	0.59		0.32	0.32
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2135	2135		569	495
v/s Ratio Prot		0.39	c0.52		0.09	
v/s Ratio Perm						c0.11
v/c Ratio		0.66	0.88		0.29	0.33
Uniform Delay, d1		20.6	26.3		37.9	38.4
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8	4.8		1.3	1.8
Delay (s)		21.4	31.0		39.2	40.2
Level of Service		C	C		D	D
Approach Delay (s)		21.4	31.0		39.7	
Approach LOS		C	C		D	

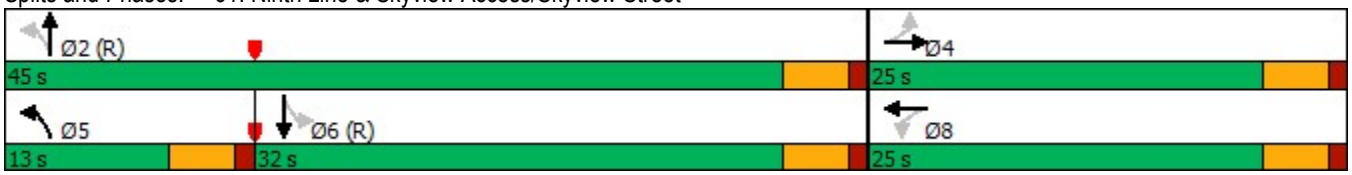
Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	149.8	Sum of lost time (s)	13.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	78	5	4	5	293	1630	14	1255
Future Volume (vph)	78	5	4	5	293	1630	14	1255
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	9.5	24.0	24.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	13.0	45.0	32.0	32.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	18.6%	64.3%	45.7%	45.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.3	9.3	9.3	9.3	51.7	51.7	34.0	34.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.74	0.74	0.49	0.49
v/c Ratio	0.42	0.52	0.04	0.04	0.67	0.63	0.10	0.82
Control Delay	34.0	10.3	25.0	20.1	17.3	9.4	20.0	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	17.3	9.4	20.0	27.2
LOS	C	B	C	C	B	A	B	C
Approach Delay		17.1		21.6		10.6		27.2
Approach LOS		B		C		B		C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 17.5	Intersection LOS: B
Intersection Capacity Utilization 78.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 61: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	78	194	4	9	293	1635	14	1375
v/c Ratio	0.42	0.52	0.04	0.04	0.67	0.63	0.10	0.82
Control Delay	34.0	10.3	25.0	20.1	17.3	9.4	20.0	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	17.3	9.4	20.0	27.2
Queue Length 50th (m)	8.8	0.5	0.4	0.6	30.1	158.7	1.5	102.6
Queue Length 95th (m)	18.4	14.4	2.5	3.6	m26.3	m158.6	m2.6	#168.3
Internal Link Dist (m)		113.0		112.5		249.3		157.0
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	405	594	238	506	436	2584	134	1684
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.33	0.02	0.02	0.67	0.63	0.10	0.82

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	5	189	4	5	4	293	1630	5	14	1255	120
Future Volume (vph)	78	5	189	4	5	4	293	1630	5	14	1255	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1573		1750	1719		1750	3498		1750	3454	
Flt Permitted	0.75	1.00		0.44	1.00		0.10	1.00		0.15	1.00	
Satd. Flow (perm)	1385	1573		814	1719		191	3498		278	3454	
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)	78	5	189	4	5	4	293	1630	5	14	1255	120
RTOR Reduction (vph)	0	164	0	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	78	30	0	4	6	0	293	1635	0	14	1366	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Effective Green, g (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.49	0.49	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	208		108	228		435	2583		135	1677	
v/s Ratio Prot		0.02			0.00		0.13	c0.47			c0.40	
v/s Ratio Perm	c0.06			0.00			0.37			0.05		
v/c Ratio	0.42	0.14		0.04	0.02		0.67	0.63		0.10	0.81	
Uniform Delay, d1	27.9	26.8		26.4	26.4		15.3	4.5		9.7	15.3	
Progression Factor	1.00	1.00		1.00	1.00		1.29	1.82		1.44	1.40	
Incremental Delay, d2	1.6	0.3		0.1	0.0		1.5	0.4		1.3	3.9	
Delay (s)	29.5	27.2		26.6	26.4		21.3	8.6		15.4	25.4	
Level of Service	C	C		C	C		C	A		B	C	
Approach Delay (s)		27.8			26.5			10.5			25.3	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	25	22	0	17	32	1253	60	42	1245	120
Future Volume (Veh/h)	18	0	25	22	0	17	32	1253	60	42	1245	120
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)	18	0	25	22	0	17	32	1253	60	42	1245	120
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.67	0.67		0.67	0.67	0.67				0.67		
vC, conflicting volume	2096	2766	682	2078	2796	656	1365			1313		
vC1, stage 1 conf vol	1389	1389		1347	1347							
vC2, stage 2 conf vol	708	1377		732	1449							
vCu, unblocked vol	1654	2651	682	1627	2696	0	1365			487		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	94	90	100	98	94			94		
cM capacity (veh/h)	135	151	392	215	131	732	499			720		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	18	25	39	32	835	478	42	830	535
Volume Left	18	0	22	32	0	0	42	0	0
Volume Right	0	25	17	0	0	60	0	0	120
cSH	135	392	310	499	1700	1700	720	1700	1700
Volume to Capacity	0.13	0.06	0.13	0.06	0.49	0.28	0.06	0.49	0.31
Queue Length 95th (m)	3.1	1.4	3.0	1.4	0.0	0.0	1.3	0.0	0.0
Control Delay (s)	35.7	14.8	18.3	12.7	0.0	0.0	10.3	0.0	0.0
Lane LOS	E	B	C	B			B		
Approach Delay (s)	23.6		18.3	0.3			0.3		
Approach LOS	C		C						

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	94	43	1652	205	25	1411
Future Volume (Veh/h)	94	43	1652	205	25	1411
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)	94	43	1652	205	25	1411
Pedestrians			1			
Lane Width (m)			3.7			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						365
pX, platoon unblocked	0.70					
vC, conflicting volume	2511	928			1857	
vC1, stage 1 conf vol	1754					
vC2, stage 2 conf vol	756					
vCu, unblocked vol	2301	928			1857	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	23	84			92	
cM capacity (veh/h)	122	273			330	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	137	1101	756	25	706	706
Volume Left	94	0	0	25	0	0
Volume Right	43	0	205	0	0	0
cSH	147	1700	1700	330	1700	1700
Volume to Capacity	0.93	0.65	0.44	0.08	0.41	0.41
Queue Length 95th (m)	45.9	0.0	0.0	1.7	0.0	0.0
Control Delay (s)	116.2	0.0	0.0	16.8	0.0	0.0
Lane LOS	F			C		
Approach Delay (s)	116.2	0.0		0.3		
Approach LOS	F					

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	22	38	1792	1417	20
Future Volume (Veh/h)	12	22	38	1792	1417	20
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	22	38	1792	1417	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				181	308	
pX, platoon unblocked	0.85	0.79	0.79			
vC, conflicting volume	2399	718	1437			
vC1, stage 1 conf vol	1427					
vC2, stage 2 conf vol	972					
vCu, unblocked vol	1186	121	1028			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	93			
cM capacity (veh/h)	235	719	532			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	22	38	896	896	945	492
Volume Left	12	0	38	0	0	0	0
Volume Right	0	22	0	0	0	0	20
cSH	235	719	532	1700	1700	1700	1700
Volume to Capacity	0.05	0.03	0.07	0.53	0.53	0.56	0.29
Queue Length 95th (m)	1.1	0.7	1.6	0.0	0.0	0.0	0.0
Control Delay (s)	21.2	10.2	12.3	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	14.0		0.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	5	8	1101	1352	57
Future Volume (Veh/h)	12	5	8	1101	1352	57
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	5	8	1101	1352	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				372	227	
pX, platoon unblocked	0.87	0.83	0.83			
vC, conflicting volume	1947	704	1409			
vC1, stage 1 conf vol	1380					
vC2, stage 2 conf vol	566					
vCu, unblocked vol	1297	218	1072			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	98			
cM capacity (veh/h)	239	649	533			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	5	8	550	550	901	508
Volume Left	12	0	8	0	0	0	0
Volume Right	0	5	0	0	0	0	57
cSH	239	649	533	1700	1700	1700	1700
Volume to Capacity	0.05	0.01	0.02	0.32	0.32	0.53	0.30
Queue Length 95th (m)	1.1	0.2	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	20.9	10.6	11.9	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	17.8		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	15	28	1180	1360	48
Future Volume (Veh/h)	25	15	28	1180	1360	48
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)	25	15	28	1180	1360	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					386	
pX, platoon unblocked	0.80	0.80	0.80			
vC, conflicting volume	2030	704	1408			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1785	123	1005			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	55	98	95			
cM capacity (veh/h)	55	722	547			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	25	15	28	590	590	907	501
Volume Left	25	0	28	0	0	0	0
Volume Right	0	15	0	0	0	0	48
cSH	55	722	547	1700	1700	1700	1700
Volume to Capacity	0.45	0.02	0.05	0.35	0.35	0.53	0.29
Queue Length 95th (m)	12.0	0.4	1.1	0.0	0.0	0.0	0.0
Control Delay (s)	115.9	10.1	11.9	0.0	0.0	0.0	0.0
Lane LOS	F	B	B				
Approach Delay (s)	76.2		0.3			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

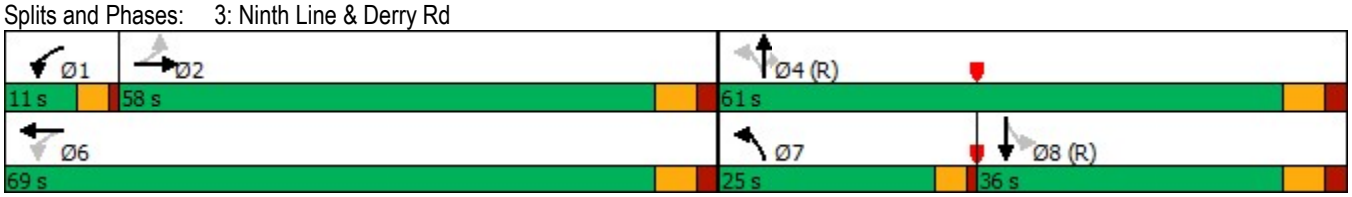
Appendix F

2031 Synchro Results – Scenario 2

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	209	1389	151	624	400	535	323	23	556
Future Volume (vph)	209	1389	151	624	400	535	323	23	556
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA
Protected Phases		2	1	6	7	4			8
Permitted Phases	2		6		4		4	8	
Detector Phase	2	2	1	6	7	4	4	8	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	7.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.1	30.1	11.0	30.1	11.0	29.4	29.4	29.4	29.4
Total Split (s)	58.0	58.0	11.0	69.0	25.0	61.0	61.0	36.0	36.0
Total Split (%)	44.6%	44.6%	8.5%	53.1%	19.2%	46.9%	46.9%	27.7%	27.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.1	2.1	1.0	2.1	1.0	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	4.0	6.1	4.0	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag	Lead		Lead			Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes
Recall Mode	Max	Max	None	Max	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	51.9	51.9	65.0	62.9	57.0	54.6	54.6	29.6	29.6
Actuated g/C Ratio	0.40	0.40	0.50	0.48	0.44	0.42	0.42	0.23	0.23
v/c Ratio	0.74	1.10	1.00	0.40	1.17	0.67	0.44	0.12	1.00
Control Delay	51.5	92.3	101.0	22.0	131.4	31.7	15.8	42.0	78.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	92.3	101.0	22.0	131.4	31.7	15.8	42.0	78.6
LOS	D	F	F	C	F	C	B	D	E
Approach Delay		87.5		36.6		59.4			77.6
Approach LOS		F		D		E			E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 18 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 69.3	Intersection LOS: E
Intersection Capacity Utilization 115.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	209	1567	151	668	400	535	323	23	833
v/c Ratio	0.74	1.10	1.00	0.40	1.17	0.67	0.44	0.12	1.00
Control Delay	51.5	92.3	101.0	22.0	131.4	31.7	15.8	42.0	78.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	92.3	101.0	22.0	131.4	31.7	15.8	42.0	78.6
Queue Length 50th (m)	41.7	~219.6	21.5	51.0	~94.8	89.8	16.3	4.3	~98.4
Queue Length 95th (m)	#78.6	#259.4	#61.9	64.5	#154.6	145.7	41.9	11.7	#138.7
Internal Link Dist (m)		119.7		244.5		681.0			237.0
Turn Bay Length (m)	75.0		80.0		130.0			95.0	
Base Capacity (vph)	281	1427	151	1687	343	798	737	188	829
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.10	1.00	0.40	1.17	0.67	0.44	0.12	1.00

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	1389	178	151	624	44	400	535	323	23	556	277
Future Volume (vph)	209	1389	178	151	624	44	400	535	323	23	556	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.1	6.1		4.0	6.1		4.0	6.4	6.4	6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1684	3556		1733	3479		1750	1902	1566	1716	3434	
Flt Permitted	0.40	1.00		0.07	1.00		0.12	1.00	1.00	0.46	1.00	
Satd. Flow (perm)	705	3556		131	3479		219	1902	1566	826	3434	
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)	209	1389	178	151	624	44	400	535	323	23	556	277
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	80	0	48	0
Lane Group Flow (vph)	209	1559	0	151	664	0	400	535	243	23	785	0
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		
Actuated Green, G (s)	51.9	51.9		62.9	62.9		54.6	54.6	54.6	29.6	29.6	
Effective Green, g (s)	51.9	51.9		62.9	62.9		54.6	54.6	54.6	29.6	29.6	
Actuated g/C Ratio	0.40	0.40		0.48	0.48		0.42	0.42	0.42	0.23	0.23	
Clearance Time (s)	6.1	6.1		4.0	6.1		4.0	6.4	6.4	6.4	6.4	
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)	281	1419		149	1683		339	798	657	188	781	
v/s Ratio Prot		c0.44		c0.05	0.19		c0.19	0.28			0.23	
v/s Ratio Perm	0.30			0.44			c0.30		0.16	0.03		
v/c Ratio	0.74	1.10		1.01	0.39		1.18	0.67	0.37	0.12	1.01	
Uniform Delay, d1	33.4	39.1		34.1	21.4		39.8	30.4	25.9	39.9	50.2	
Progression Factor	1.00	1.00		1.00	1.00		0.99	0.90	0.96	1.00	1.00	
Incremental Delay, d2	16.3	55.7		77.3	0.7		103.1	3.6	1.3	1.3	33.5	
Delay (s)	49.7	94.8		111.4	22.1		142.4	31.2	26.2	41.2	83.7	
Level of Service	D	F		F	C		F	C	C	D	F	
Approach Delay (s)		89.5			38.6			65.3			82.6	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	72.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	119	1301	88	826
Future Volume (vph)	119	1301	88	826
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	22.5	22.5	22.5
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	11.2	43.3	43.3	43.3
Actuated g/C Ratio	0.17	0.67	0.67	0.67
v/c Ratio	0.60	0.61	0.51	0.35
Control Delay	25.5	3.6	26.2	11.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	3.6	26.2	11.2
LOS	C	A	C	B
Approach Delay	25.5	3.6		12.6
Approach LOS	C	A		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 22 (34%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	206	1429	88	826
v/c Ratio	0.60	0.61	0.51	0.35
Control Delay	25.5	3.6	26.2	11.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	3.6	26.2	11.2
Queue Length 50th (m)	16.1	18.7	15.5	64.1
Queue Length 95th (m)	29.8	23.7	m16.2	m65.2
Internal Link Dist (m)	168.5	178.7		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	519	2359	173	2358
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.61	0.51	0.35

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	119	87	1301	128	88	826
Future Volume (vph)	119	87	1301	128	88	826
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1748		3530		1785	3544
Flt Permitted	0.97		1.00		0.14	1.00
Satd. Flow (perm)	1748		3530		261	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	119	87	1301	128	88	826
RTOR Reduction (vph)	41	0	9	0	0	0
Lane Group Flow (vph)	165	0	1420	0	88	826
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	11.2		43.3		43.3	43.3
Effective Green, g (s)	11.2		43.3		43.3	43.3
Actuated g/C Ratio	0.17		0.67		0.67	0.67
Clearance Time (s)	6.0		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	301		2351		173	2360
v/s Ratio Prot			c0.40			0.23
v/s Ratio Perm	c0.09				0.34	
v/c Ratio	0.55		0.60		0.51	0.35
Uniform Delay, d1	24.6		6.1		5.5	4.7
Progression Factor	1.00		0.41		2.85	2.13
Incremental Delay, d2	2.1		0.9		2.6	0.1
Delay (s)	26.6		3.4		18.2	10.2
Level of Service	C		A		B	B
Approach Delay (s)	26.6		3.4			10.9
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	133	13	111	5	17	1256	120	828
Future Volume (vph)	133	13	111	5	17	1256	120	828
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	24.0	24.0	25.0	25.0	25.0	25.0
Total Split (s)	24.0	24.0	24.0	24.0	41.0	41.0	41.0	41.0
Total Split (%)	36.9%	36.9%	36.9%	36.9%	63.1%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.7	12.7	12.7	12.7	39.3	39.3	39.3	39.3
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.60	0.60	0.60	0.60
v/c Ratio	0.58	0.19	0.44	0.52	0.05	0.65	0.76	0.39
Control Delay	32.9	9.3	27.3	22.3	3.2	4.2	48.2	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	9.3	27.3	22.3	3.2	4.2	48.2	3.0
LOS	C	A	C	C	A	A	D	A
Approach Delay		25.0		24.2		4.2		8.6
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 55 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 85.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	67	111	180	17	1392	120	845
v/c Ratio	0.58	0.19	0.44	0.52	0.05	0.65	0.76	0.39
Control Delay	32.9	9.3	27.3	22.3	3.2	4.2	48.2	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	9.3	27.3	22.3	3.2	4.2	48.2	3.0
Queue Length 50th (m)	13.6	1.2	11.0	13.6	0.3	14.5	21.3	9.2
Queue Length 95th (m)	24.9	8.1	20.6	25.9	m0.7	19.0	#44.8	11.5
Internal Link Dist (m)		131.2		392.7		51.3		372.4
Turn Bay Length (m)			25.0		15.0		80.0	
Base Capacity (vph)	328	487	360	470	358	2137	157	2159
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	0.41	0.14	0.31	0.38	0.05	0.65	0.76	0.39

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	13	54	111	5	175	17	1256	136	120	828	17
Future Volume (vph)	133	13	54	111	5	175	17	1256	136	120	828	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		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	0.95	
Frt	1.00	0.88		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1619		1733	1589		1750	3519		1750	3568	
Flt Permitted	0.64	1.00		0.71	1.00		0.32	1.00		0.14	1.00	
Satd. Flow (perm)	1186	1619		1301	1589		593	3519		260	3568	
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)	133	13	54	111	5	175	17	1256	136	120	828	17
RTOR Reduction (vph)	0	43	0	0	35	0	0	10	0	0	2	0
Lane Group Flow (vph)	133	24	0	111	145	0	17	1382	0	120	843	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.7	12.7		12.7	12.7		39.3	39.3		39.3	39.3	
Effective Green, g (s)	12.7	12.7		12.7	12.7		39.3	39.3		39.3	39.3	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.60	0.60		0.60	0.60	
Clearance Time (s)	6.0	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	3.0	
Lane Grp Cap (vph)	231	316		254	310		358	2127		157	2157	
v/s Ratio Prot		0.01			0.09			0.39			0.24	
v/s Ratio Perm	c0.11			0.09			0.03			c0.46		
v/c Ratio	0.58	0.07		0.44	0.47		0.05	0.65		0.76	0.39	
Uniform Delay, d1	23.7	21.4		23.0	23.2		5.2	8.4		9.4	6.7	
Progression Factor	1.00	1.00		1.00	1.00		0.43	0.31		1.40	0.34	
Incremental Delay, d2	3.4	0.1		1.2	1.1		0.2	1.4		28.1	0.5	
Delay (s)	27.2	21.5		24.2	24.3		2.5	4.0		41.3	2.8	
Level of Service	C	C		C	C		A	A		D	A	
Approach Delay (s)		25.2			24.3			4.0			7.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	0	228	0	30	1011	30	954
Future Volume (vph)	93	0	228	0	30	1011	30	954
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	5.0	5.0	8.0	8.0	7.0	8.0
Minimum Split (s)	23.5	23.5	24.0	24.0	23.0	23.0	11.0	23.0
Total Split (s)	24.0	24.0	24.0	24.0	30.0	30.0	11.0	41.0
Total Split (%)	36.9%	36.9%	36.9%	36.9%	46.2%	46.2%	16.9%	63.1%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	6.0	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	15.2	15.2	15.7	15.7	31.9	31.9	39.3	36.3
Actuated g/C Ratio	0.23	0.23	0.24	0.24	0.49	0.49	0.60	0.56
v/c Ratio	0.32	0.20	0.78	0.20	0.11	0.66	0.09	0.48
Control Delay	22.7	2.9	41.7	0.8	8.6	19.0	3.7	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	2.9	41.7	0.8	8.6	19.0	3.7	5.2
LOS	C	A	D	A	A	B	A	A
Approach Delay		12.8		27.8		18.7		5.2
Approach LOS		B		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 62 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 61.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	93	228	117	30	1123	30	962
v/c Ratio	0.32	0.20	0.78	0.20	0.11	0.66	0.09	0.48
Control Delay	22.7	2.9	41.7	0.8	8.6	19.0	3.7	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	2.9	41.7	0.8	8.6	19.0	3.7	5.2
Queue Length 50th (m)	8.2	0.0	22.6	0.0	0.8	60.7	0.7	15.5
Queue Length 95th (m)	18.1	4.7	#48.1	0.0	m3.4	#146.5	2.0	26.2
Internal Link Dist (m)		114.7		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	338	519	338	630	269	1699	327	1999
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	0.28	0.18	0.67	0.19	0.11	0.66	0.09	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	93	228	0	117	30	1011	112	30	954	8
Future Volume (vph)	93	0	93	228	0	117	30	1011	112	30	954	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.0	6.0		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3437		1785	3574	
Flt Permitted	0.68	1.00		0.70	1.00		0.30	1.00		0.14	1.00	
Satd. Flow (perm)	1256	1566		1223	1566		548	3437		272	3574	
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)	93	0	93	228	0	117	30	1011	112	30	954	8
RTOR Reduction (vph)	0	71	0	0	89	0	0	11	0	0	1	0
Lane Group Flow (vph)	93	22	0	228	28	0	30	1112	0	30	961	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.2	15.2		15.7	15.7		29.5	29.5		36.3	36.3	
Effective Green, g (s)	15.2	15.2		15.7	15.7		29.5	29.5		36.3	36.3	
Actuated g/C Ratio	0.23	0.23		0.24	0.24		0.45	0.45		0.56	0.56	
Clearance Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		4.0	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)	293	366		295	378		248	1559		217	1995	
v/s Ratio Prot		0.01			0.02			c0.32		0.01	c0.27	
v/s Ratio Perm	0.07			c0.19			0.05			0.07		
v/c Ratio	0.32	0.06		0.77	0.07		0.12	0.71		0.14	0.48	
Uniform Delay, d1	20.6	19.3		23.0	19.0		10.3	14.3		8.1	8.7	
Progression Factor	1.00	1.00		1.00	1.00		0.62	1.21		0.53	0.48	
Incremental Delay, d2	0.6	0.1		11.9	0.1		0.7	2.1		0.3	0.8	
Delay (s)	21.2	19.4		34.9	19.1		7.1	19.4		4.6	5.0	
Level of Service	C	B		C	B		A	B		A	A	
Approach Delay (s)		20.3			29.5			19.1			5.0	
Approach LOS		C			C			B			A	

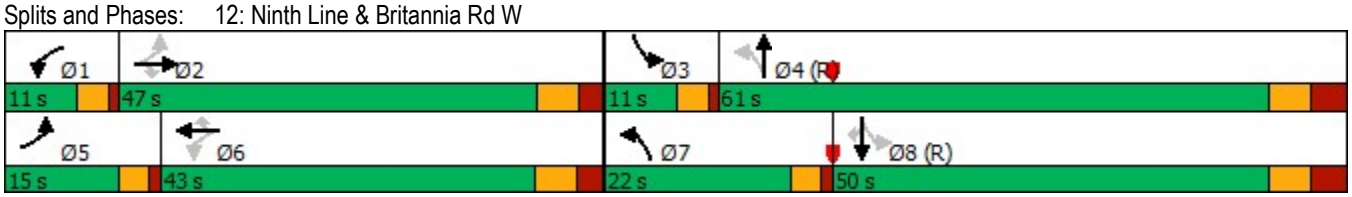
Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	151	1294	400	100	675	95	400	906	82	944	143
Future Volume (vph)	151	1294	400	100	675	95	400	906	82	944	143
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	3	8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	5	2	2	1	6	6	7	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0	12.0
Minimum Split (s)	11.0	26.5	26.5	11.0	26.7	26.7	11.0	47.7	11.0	47.7	47.7
Total Split (s)	15.0	47.0	47.0	11.0	43.0	43.0	22.0	61.0	11.0	50.0	50.0
Total Split (%)	11.5%	36.2%	36.2%	8.5%	33.1%	33.1%	16.9%	46.9%	8.5%	38.5%	38.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.7	2.7	1.0	3.7	1.0	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7	4.0	7.7	7.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	53.5	40.5	40.5	46.5	36.8	36.8	68.0	53.3	53.0	42.3	42.3
Actuated g/C Ratio	0.41	0.31	0.31	0.36	0.28	0.28	0.52	0.41	0.41	0.33	0.33
v/c Ratio	0.56	1.14	0.58	0.64	0.66	0.18	1.25	0.74	0.42	0.81	0.24
Control Delay	32.8	114.1	14.4	43.9	44.9	2.3	161.9	28.9	21.1	37.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	114.1	14.4	43.9	44.9	2.3	161.9	28.9	21.1	37.3	6.2
LOS	C	F	B	D	D	A	F	C	C	D	A
Approach Delay		85.8			40.1			65.4		32.4	
Approach LOS		F			D			E		C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 81 (62%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.25	
Intersection Signal Delay: 61.1	Intersection LOS: E
Intersection Capacity Utilization 108.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	151	1294	400	100	675	95	400	1060	82	944	143
v/c Ratio	0.56	1.14	0.58	0.64	0.66	0.18	1.25	0.74	0.42	0.81	0.24
Control Delay	32.8	114.1	14.4	43.9	44.9	2.3	161.9	28.9	21.1	37.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	114.1	14.4	43.9	44.9	2.3	161.9	28.9	21.1	37.3	6.2
Queue Length 50th (m)	22.5	~187.1	21.0	14.4	74.5	0.0	~100.6	79.5	8.1	98.5	2.6
Queue Length 95th (m)	36.2	#226.1	51.2	#28.7	93.7	3.6	m#121.1	m79.7	m15.3	113.3	m10.0
Internal Link Dist (m)		80.1			420.4			341.1		608.8	
Turn Bay Length (m)	80.0		80.0	70.0		70.0	75.0		60.0		60.0
Base Capacity (vph)	277	1137	687	157	1024	531	321	1433	194	1164	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	1.14	0.58	0.64	0.66	0.18	1.25	0.74	0.42	0.81	0.24

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	1294	400	100	675	95	400	906	154	82	944	143
Future Volume (vph)	151	1294	400	100	675	95	400	906	154	82	944	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7		4.0	7.7	7.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1785	3650	1581	1767	3614	1521	1767	3471		1668	3579	1581
Flt Permitted	0.20	1.00	1.00	0.11	1.00	1.00	0.11	1.00		0.17	1.00	1.00
Satd. Flow (perm)	381	3650	1581	202	3614	1521	202	3471		298	3579	1581
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)	151	1294	400	100	675	95	400	906	154	82	944	143
RTOR Reduction (vph)	0	0	195	0	0	68	0	11	0	0	0	89
Lane Group Flow (vph)	151	1294	205	100	675	27	400	1049	0	82	944	54
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	51.0	40.5	40.5	43.8	36.8	36.8	64.3	53.3		49.3	42.3	42.3
Effective Green, g (s)	51.0	40.5	40.5	43.8	36.8	36.8	64.3	53.3		49.3	42.3	42.3
Actuated g/C Ratio	0.39	0.31	0.31	0.34	0.28	0.28	0.49	0.41		0.38	0.33	0.33
Clearance Time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7		4.0	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	262	1137	492	152	1023	430	316	1423		186	1164	514
v/s Ratio Prot	c0.05	c0.35		0.04	0.19		c0.17	0.30		0.02	0.26	
v/s Ratio Perm	0.18		0.13	0.19		0.02	c0.45			0.14		0.03
v/c Ratio	0.58	1.14	0.42	0.66	0.66	0.06	1.27	0.74		0.44	0.81	0.10
Uniform Delay, d1	28.1	44.8	35.4	34.7	41.1	34.0	37.1	32.4		27.5	40.2	30.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.34	0.84		0.89	0.78	0.84
Incremental Delay, d2	3.1	73.2	2.6	9.8	3.3	0.3	133.1	1.9		1.5	5.5	0.4
Delay (s)	31.2	118.0	38.0	44.5	44.4	34.3	182.7	29.1		26.0	37.0	26.1
Level of Service	C	F	D	D	D	C	F	C		C	D	C
Approach Delay (s)		93.5			43.3			71.2			34.9	
Approach LOS		F			D			E			C	

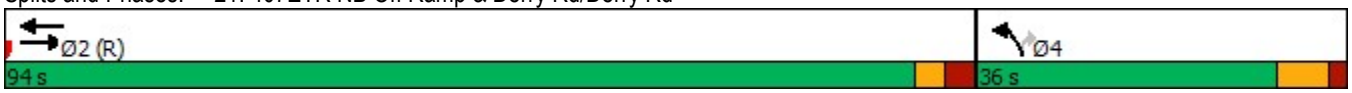
Intersection Summary			
HCM 2000 Control Delay	66.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1567	1102	19	185
Future Volume (vph)	1567	1102	19	185
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	94.0	94.0	36.0	36.0
Total Split (%)	72.3%	72.3%	27.7%	27.7%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	88.0	88.0	29.0	29.0
Actuated g/C Ratio	0.68	0.68	0.22	0.22
v/c Ratio	0.65	0.46	0.03	0.49
Control Delay	13.6	10.7	39.7	37.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.6	10.7	39.7	37.2
LOS	B	B	D	D
Approach Delay	13.6	10.7	37.4	
Approach LOS	B	B	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1567	1102	19	185
v/c Ratio	0.65	0.46	0.03	0.49
Control Delay	13.6	10.7	39.7	37.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.6	10.7	39.7	37.2
Queue Length 50th (m)	102.8	59.2	1.8	28.0
Queue Length 95th (m)	122.0	71.5	4.9	49.9
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2422	2376	654	374
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.46	0.03	0.49

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1567	0	0	1102	19	185
Future Volume (vph)	1567	0	0	1102	19	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1567	0	0	1102	19	185
RTOR Reduction (vph)	0	0	0	0	0	38
Lane Group Flow (vph)	1567	0	0	1102	19	147
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	88.0			88.0	29.0	29.0
Effective Green, g (s)	88.0			88.0	29.0	29.0
Actuated g/C Ratio	0.68			0.68	0.22	0.22
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2422			2376	654	336
v/s Ratio Prot	c0.44			0.31	0.01	
v/s Ratio Perm						c0.10
v/c Ratio	0.65			0.46	0.03	0.44
Uniform Delay, d1	12.1			9.9	39.5	43.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.4			0.7	0.1	4.1
Delay (s)	13.4			10.5	39.6	47.6
Level of Service	B			B	D	D
Approach Delay (s)	13.4			10.5	46.8	
Approach LOS	B			B	D	

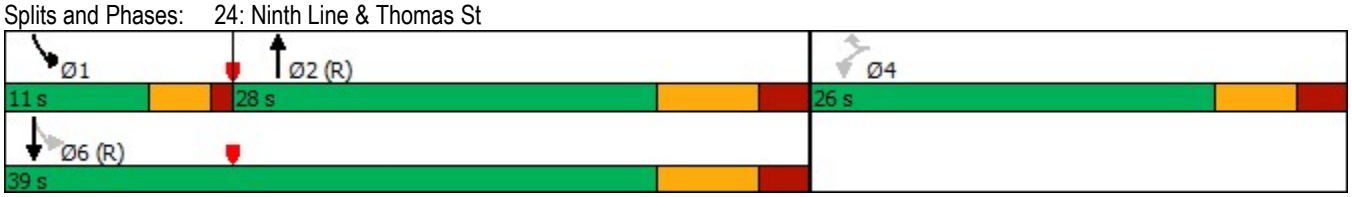
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	208	183	1267	142	1396
Future Volume (vph)	208	183	1267	142	1396
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	26.0	26.0	28.0	11.0	39.0
Total Split (%)	40.0%	40.0%	43.1%	16.9%	60.0%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.5	4.0	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	12.9	12.9	28.4	41.6	38.1
Actuated g/C Ratio	0.20	0.20	0.44	0.64	0.59
v/c Ratio	0.60	0.41	0.95	0.46	0.67
Control Delay	30.3	6.7	30.5	12.3	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	6.7	30.5	12.3	10.5
LOS	C	A	C	B	B
Approach Delay	19.3		30.5		10.7
Approach LOS	B		C		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 31 (48%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 20.2	Intersection LOS: C
Intersection Capacity Utilization 75.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	208	183	1457	142	1396
v/c Ratio	0.60	0.41	0.95	0.46	0.67
Control Delay	30.3	6.7	30.5	12.3	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	6.7	30.5	12.3	10.5
Queue Length 50th (m)	21.1	0.0	~117.3	6.2	30.5
Queue Length 95th (m)	34.7	11.5	#198.3	m14.8	145.8
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	524	576	1534	312	2095
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.32	0.95	0.46	0.67

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.

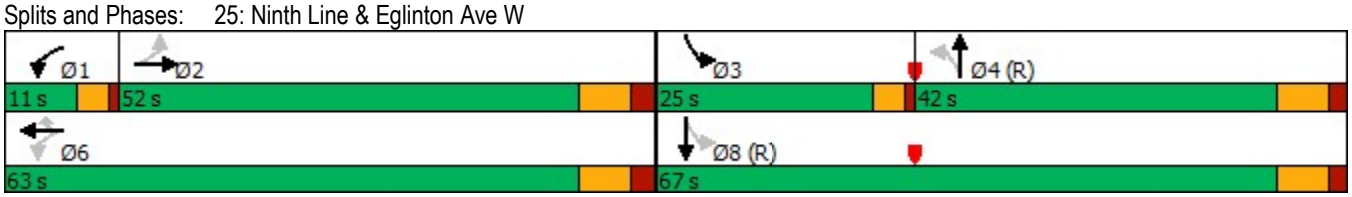
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	208	183	1267	190	142	1396
Future Volume (vph)	208	183	1267	190	142	1396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.5		4.0	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1748	1493	3474		1653	3579
Flt Permitted	0.95	1.00	1.00		0.13	1.00
Satd. Flow (perm)	1748	1493	3474		220	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	208	183	1267	190	142	1396
RTOR Reduction (vph)	0	147	15	0	0	0
Lane Group Flow (vph)	208	36	1442	0	142	1396
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	12.9	12.9	27.7		38.1	38.1
Effective Green, g (s)	12.9	12.9	27.7		38.1	38.1
Actuated g/C Ratio	0.20	0.20	0.43		0.59	0.59
Clearance Time (s)	6.5	6.5	7.5		4.0	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	346	296	1480		270	2097
v/s Ratio Prot			c0.41		0.05	c0.39
v/s Ratio Perm	c0.12	0.02			0.26	
v/c Ratio	0.60	0.12	0.97		0.53	0.67
Uniform Delay, d1	23.7	21.4	18.3		11.4	9.1
Progression Factor	1.00	1.00	0.70		1.62	0.93
Incremental Delay, d2	2.9	0.2	16.8		1.4	1.2
Delay (s)	26.6	21.6	29.6		19.8	9.8
Level of Service	C	C	C		B	A
Approach Delay (s)	24.3		29.6			10.7
Approach LOS	C		C			B

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	37	612	99	264	256	23	757	400	1280
Future Volume (vph)	37	612	99	264	256	23	757	400	1280
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2	1	6			4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	4	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.0	32.5	32.5	40.0	40.0	11.0	40.0
Total Split (s)	52.0	52.0	11.0	63.0	63.0	42.0	42.0	25.0	67.0
Total Split (%)	40.0%	40.0%	8.5%	48.5%	48.5%	32.3%	32.3%	19.2%	51.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	44.5	44.5	59.0	55.5	55.5	35.0	35.0	63.0	60.0
Actuated g/C Ratio	0.34	0.34	0.45	0.43	0.43	0.27	0.27	0.48	0.46
v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.62	0.96	1.19	0.82
Control Delay	30.3	124.0	41.3	26.4	3.9	106.3	67.6	135.8	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	124.0	41.3	26.4	3.9	106.3	67.6	135.8	38.2
LOS	C	F	D	C	A	F	E	F	D
Approach Delay		119.5		19.4			68.5		60.6
Approach LOS		F		B			E		E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 37 (28%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 67.3	Intersection LOS: E
Intersection Capacity Utilization 113.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	37	730	99	264	256	23	894	400	1347
v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.62	0.96	1.19	0.82
Control Delay	30.3	124.0	41.3	26.4	3.9	106.3	67.6	135.8	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	124.0	41.3	26.4	3.9	106.3	67.6	135.8	38.2
Queue Length 50th (m)	5.9	~201.8	13.3	40.9	0.0	4.8	108.2	~96.3	165.6
Queue Length 95th (m)	13.6	#270.6	#29.2	60.5	14.3	#19.7	#146.5	#154.0	187.4
Internal Link Dist (m)		373.3		388.7			291.0		247.1
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	358	634	153	796	778	37	930	337	1644
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.62	0.96	1.19	0.82

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	612	118	99	264	256	23	757	137	400	1280	67
Future Volume (vph)	37	612	118	99	264	256	23	757	137	400	1280	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1837		1733	1865	1479	1069	3414		1716	3555	
Flt Permitted	0.60	1.00		0.08	1.00	1.00	0.12	1.00		0.10	1.00	
Satd. Flow (perm)	1047	1837		150	1865	1479	140	3414		185	3555	
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)	37	612	118	99	264	256	23	757	137	400	1280	67
RTOR Reduction (vph)	0	5	0	0	0	147	0	12	0	0	3	0
Lane Group Flow (vph)	37	725	0	99	264	109	23	882	0	400	1344	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Effective Green, g (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Actuated g/C Ratio	0.34	0.34		0.43	0.43	0.43	0.27	0.27		0.46	0.46	
Clearance Time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	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)	358	628		149	796	631	37	919		332	1640	
v/s Ratio Prot		c0.39		c0.04	0.14			0.26		c0.19	0.38	
v/s Ratio Perm	0.04			0.25		0.07	0.16			c0.36		
v/c Ratio	0.10	1.15		0.66	0.33	0.17	0.62	0.96		1.20	0.82	
Uniform Delay, d1	29.1	42.8		30.7	24.9	23.1	41.7	46.8		40.3	30.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.97	1.15	
Incremental Delay, d2	0.6	86.5		10.6	1.1	0.6	59.3	21.5		109.7	3.1	
Delay (s)	29.7	129.3		41.3	26.0	23.6	101.0	68.3		149.0	37.9	
Level of Service	C	F		D	C	C	F	E		F	D	
Approach Delay (s)		124.5			27.5			69.1			63.3	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	70.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	48	1267	48	1572
Future Volume (vph)	48	1267	48	1572
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	24.5	24.0	24.0
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.2	47.3	47.3	47.3
Actuated g/C Ratio	0.14	0.73	0.73	0.73
v/c Ratio	0.50	0.53	0.22	0.60
Control Delay	23.4	1.5	3.5	2.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.4	1.5	3.5	2.4
LOS	C	A	A	A
Approach Delay	23.4	1.5		2.5
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 55 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 3.0	Intersection LOS: A
Intersection Capacity Utilization 61.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	1342	48	1572
v/c Ratio	0.50	0.53	0.22	0.60
Control Delay	23.4	1.5	3.5	2.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.4	1.5	3.5	2.4
Queue Length 50th (m)	9.8	5.1	0.8	14.4
Queue Length 95th (m)	21.4	6.7	m1.5	18.7
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	506	2554	222	2605
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.53	0.22	0.60

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	93	1267	75	48	1572
Future Volume (vph)	48	93	1267	75	48	1572
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1709		3503		1684	3579
Flt Permitted	0.98		1.00		0.17	1.00
Satd. Flow (perm)	1709		3503		305	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	93	1267	75	48	1572
RTOR Reduction (vph)	40	0	4	0	0	0
Lane Group Flow (vph)	101	0	1338	0	48	1572
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	8.1		44.9		44.9	44.9
Effective Green, g (s)	8.1		44.9		44.9	44.9
Actuated g/C Ratio	0.12		0.69		0.69	0.69
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	212		2419		210	2472
v/s Ratio Prot			0.38			c0.44
v/s Ratio Perm	c0.06				0.16	
v/c Ratio	0.48		0.55		0.23	0.64
Uniform Delay, d1	26.5		5.0		3.7	5.5
Progression Factor	1.00		0.15		0.32	0.27
Incremental Delay, d2	1.7		0.8		2.0	1.0
Delay (s)	28.2		1.6		3.2	2.5
Level of Service	C		A		A	A
Approach Delay (s)	28.2		1.6			2.5
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	142	75	1039	108	1646
Future Volume (vph)	142	75	1039	108	1646
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	23.0	23.0	31.0	11.0	42.0
Total Split (%)	35.4%	35.4%	47.7%	16.9%	64.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.8	10.8	36.6	46.6	45.8
Actuated g/C Ratio	0.17	0.17	0.56	0.72	0.70
v/c Ratio	0.48	0.23	0.58	0.28	0.65
Control Delay	29.7	8.1	19.7	7.8	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	8.1	19.7	7.8	12.1
LOS	C	A	B	A	B
Approach Delay	22.2		19.7		11.8
Approach LOS	C		B		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 14 (22%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	142	75	1116	108	1646
v/c Ratio	0.48	0.23	0.58	0.28	0.65
Control Delay	29.7	8.1	19.7	7.8	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	8.1	19.7	7.8	12.1
Queue Length 50th (m)	14.6	0.0	68.5	7.5	96.5
Queue Length 95th (m)	26.3	8.1	120.4	13.3	86.7
Internal Link Dist (m)	358.4		284.9		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	448	461	1924	389	2521
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.16	0.58	0.28	0.65

Intersection Summary

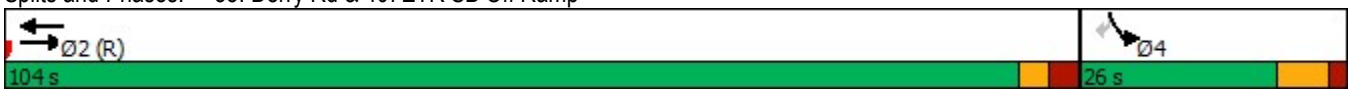
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	142	75	1039	77	108	1646
Future Volume (vph)	142	75	1039	77	108	1646
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3409		1785	3579
Flt Permitted	0.95	1.00	1.00		0.16	1.00
Satd. Flow (perm)	1765	1597	3409		308	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	75	1039	77	108	1646
RTOR Reduction (vph)	0	64	7	0	0	0
Lane Group Flow (vph)	142	11	1109	0	108	1646
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	9.2	9.2	33.3		43.3	43.3
Effective Green, g (s)	9.2	9.2	33.3		43.3	43.3
Actuated g/C Ratio	0.14	0.14	0.51		0.67	0.67
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	249	226	1746		341	2384
v/s Ratio Prot			0.33		0.03	c0.46
v/s Ratio Perm	c0.08	0.01			0.18	
v/c Ratio	0.57	0.05	0.64		0.32	0.69
Uniform Delay, d1	26.1	24.1	11.5		5.6	6.7
Progression Factor	1.00	1.00	1.45		1.58	1.47
Incremental Delay, d2	3.1	0.1	1.7		0.5	1.4
Delay (s)	29.2	24.2	18.3		9.4	11.3
Level of Service	C	C	B		A	B
Approach Delay (s)	27.5		18.3			11.2
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1923	904	54	46
Future Volume (vph)	1923	904	54	46
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	104.0	104.0	26.0	26.0
Total Split (%)	80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	113.0	113.0	8.0	8.0
Actuated g/C Ratio	0.87	0.87	0.06	0.06
v/c Ratio	0.61	0.30	0.28	0.37
Control Delay	4.3	2.3	61.5	24.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.3	2.3	61.5	24.6
LOS	A	A	E	C
Approach Delay	4.3	2.3	44.5	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 5.0	Intersection LOS: A
Intersection Capacity Utilization 69.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1923	904	54	46
v/c Ratio	0.61	0.30	0.28	0.37
Control Delay	4.3	2.3	61.5	24.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.3	2.3	61.5	24.6
Queue Length 50th (m)	61.6	18.2	6.3	0.0
Queue Length 95th (m)	85.2	26.2	12.5	11.3
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	3141	3050	460	230
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.30	0.12	0.20

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1923	904	0	54	46
Future Volume (vph)	0	1923	904	0	54	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1923	904	0	54	46
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	0	1923	904	0	54	2
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		110.4	110.4		6.6	6.6
Effective Green, g (s)		110.4	110.4		6.6	6.6
Actuated g/C Ratio		0.85	0.85		0.05	0.05
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3069	2980		159	66
v/s Ratio Prot		c0.53	0.26		c0.02	
v/s Ratio Perm						0.00
v/c Ratio		0.63	0.30		0.34	0.04
Uniform Delay, d1		3.2	2.0		59.6	58.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.0	0.3		1.3	0.2
Delay (s)		4.1	2.3		60.9	58.9
Level of Service		A	A		E	E
Approach Delay (s)		4.1	2.3		60.0	
Approach LOS		A	A		E	

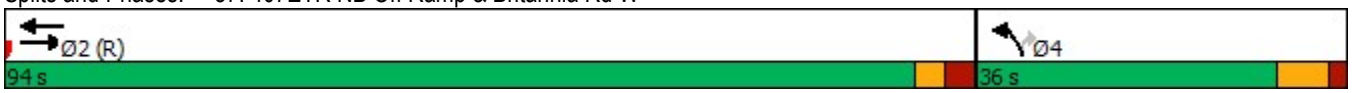
Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1648	1032	69	191
Future Volume (vph)	1648	1032	69	191
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	94.0	94.0	36.0	36.0
Total Split (%)	72.3%	72.3%	27.7%	27.7%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	98.9	98.9	18.1	18.1
Actuated g/C Ratio	0.76	0.76	0.14	0.14
v/c Ratio	0.60	0.38	0.31	0.76
Control Delay	8.6	6.2	52.0	60.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.6	6.2	52.0	60.1
LOS	A	A	D	E
Approach Delay	8.6	6.2	57.9	
Approach LOS	A	A	E	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 57.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1648	1032	69	191
v/c Ratio	0.60	0.38	0.31	0.76
Control Delay	8.6	6.2	52.0	60.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.6	6.2	52.0	60.1
Queue Length 50th (m)	77.8	37.3	14.8	34.7
Queue Length 95th (m)	120.3	59.0	26.4	55.0
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2750	2723	358	381
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.38	0.19	0.50

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1648	0	0	1032	69	191
Future Volume (vph)	1648	0	0	1032	69	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1648	0	0	1032	69	191
RTOR Reduction (vph)	0	0	0	0	0	35
Lane Group Flow (vph)	1648	0	0	1032	69	156
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	98.9			98.9	18.1	18.1
Effective Green, g (s)	98.9			98.9	18.1	18.1
Actuated g/C Ratio	0.76			0.76	0.14	0.14
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2749			2722	223	218
v/s Ratio Prot	c0.46			0.29	0.04	
v/s Ratio Perm						c0.10
v/c Ratio	0.60			0.38	0.31	0.71
Uniform Delay, d1	6.8			5.2	50.3	53.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.0			0.4	0.8	10.6
Delay (s)	7.8			5.6	51.1	64.0
Level of Service	A			A	D	E
Approach Delay (s)	7.8			5.6	60.6	
Approach LOS	A			A	E	

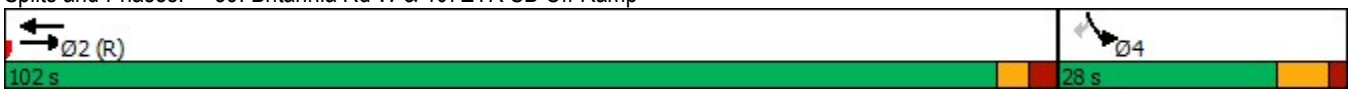
Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1763	965	70	63
Future Volume (vph)	1763	965	70	63
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	102.0	102.0	28.0	28.0
Total Split (%)	78.5%	78.5%	21.5%	21.5%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	106.2	106.2	10.8	10.8
Actuated g/C Ratio	0.82	0.82	0.08	0.08
v/c Ratio	0.60	0.33	0.50	0.40
Control Delay	5.5	3.5	68.5	20.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	3.5	68.5	20.3
LOS	A	A	E	C
Approach Delay	5.5	3.5	45.6	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1763	965	70	63
v/c Ratio	0.60	0.33	0.50	0.40
Control Delay	5.5	3.5	68.5	20.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	3.5	68.5	20.3
Queue Length 50th (m)	62.5	23.9	16.1	0.0
Queue Length 95th (m)	91.7	36.3	29.4	12.5
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2951	2922	272	248
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.33	0.26	0.25

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1763	965	0	70	63
Future Volume (vph)	0	1763	965	0	70	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1763	965	0	70	63
RTOR Reduction (vph)	0	0	0	0	0	58
Lane Group Flow (vph)	0	1763	965	0	70	5
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		106.2	106.2		10.8	10.8
Effective Green, g (s)		106.2	106.2		10.8	10.8
Actuated g/C Ratio		0.82	0.82		0.08	0.08
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2952	2923		139	100
v/s Ratio Prot		c0.49	0.27		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.60	0.33		0.50	0.05
Uniform Delay, d1		4.3	3.0		57.0	54.9
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.9	0.3		2.9	0.2
Delay (s)		5.2	3.3		59.9	55.1
Level of Service		A	A		E	E
Approach Delay (s)		5.2	3.3		57.6	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	116	5	5	5	100	957	2	1617
Future Volume (vph)	116	5	5	5	100	957	2	1617
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	24.0	24.0	24.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	40.0	40.0	40.0	40.0
Total Split (%)	38.5%	38.5%	38.5%	38.5%	61.5%	61.5%	61.5%	61.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	16.0	16.0	16.0	16.0	40.0	40.0	40.0	40.0
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.62	0.62	0.62	0.62
v/c Ratio	0.34	0.72	0.03	0.04	0.88	0.45	0.01	0.77
Control Delay	21.8	31.3	16.6	10.7	74.1	7.5	11.5	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	31.3	16.6	10.7	74.1	7.5	11.5	17.6
LOS	C	C	B	B	E	A	B	B
Approach Delay		28.6		12.0		13.8		17.6
Approach LOS		C		B		B		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 64: Ninth Line & Skyview Access/Skyview Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	290	5	17	100	959	2	1659
v/c Ratio	0.34	0.72	0.03	0.04	0.88	0.45	0.01	0.77
Control Delay	21.8	31.3	16.6	10.7	74.1	7.5	11.5	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	31.3	16.6	10.7	74.1	7.5	11.5	17.6
Queue Length 50th (m)	10.5	27.2	0.4	0.4	13.6	53.6	0.2	112.8
Queue Length 95th (m)	20.0	44.7	2.3	3.7	m#28.1	m107.0	m0.2	108.4
Internal Link Dist (m)		76.6		97.1		247.1		158.7
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	433	508	234	527	113	2155	293	2149
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	0.27	0.57	0.02	0.03	0.88	0.45	0.01	0.77

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	5	285	5	5	12	100	957	2	2	1617	42
Future Volume (vph)	116	5	285	5	5	12	100	957	2	2	1617	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1571		1750	1647		1750	3499		1750	3487	
Flt Permitted	0.75	1.00		0.40	1.00		0.10	1.00		0.26	1.00	
Satd. Flow (perm)	1375	1571		743	1647		184	3499		478	3487	
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)	116	5	285	5	5	12	100	957	2	2	1617	42
RTOR Reduction (vph)	0	14	0	0	9	0	0	0	0	0	2	0
Lane Group Flow (vph)	116	276	0	5	8	0	100	959	0	2	1657	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		40.0	40.0		40.0	40.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.62	0.62		0.62	0.62	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	338	386		182	405		113	2153		294	2145	
v/s Ratio Prot		c0.18			0.00			0.27			0.48	
v/s Ratio Perm	0.08			0.01			c0.54			0.00		
v/c Ratio	0.34	0.71		0.03	0.02		0.88	0.45		0.01	0.77	
Uniform Delay, d1	20.2	22.4		18.6	18.6		10.6	6.6		4.8	9.2	
Progression Factor	1.00	1.00		1.00	1.00		2.30	0.98		1.77	1.52	
Incremental Delay, d2	0.6	6.2		0.1	0.0		41.7	0.4		0.0	2.2	
Delay (s)	20.8	28.6		18.7	18.6		66.0	6.9		8.6	16.1	
Level of Service	C	C		B	B		E	A		A	B	
Approach Delay (s)		26.3			18.6			12.5			16.1	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	0	42	46	0	68	10	1147	36	30	1012	39
Future Volume (Veh/h)	29	0	42	46	0	68	10	1147	36	30	1012	39
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)	29	0	42	46	0	68	10	1147	36	30	1012	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.77	0.77		0.77	0.77	0.77				0.77		
vC, conflicting volume	1753	2294	526	1793	2296	592	1051			1183		
vC1, stage 1 conf vol	1092	1092		1185	1185							
vC2, stage 2 conf vol	662	1203		608	1111							
vCu, unblocked vol	1384	2086	526	1436	2088	0	1051			646		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	92	82	100	92	98			96		
cM capacity (veh/h)	208	204	497	251	205	842	658			717		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	42	114	10	765	418	30	675	376
Volume Left	29	0	46	10	0	0	30	0	0
Volume Right	0	42	68	0	0	36	0	0	39
cSH	208	497	432	658	1700	1700	717	1700	1700
Volume to Capacity	0.14	0.08	0.26	0.02	0.45	0.25	0.04	0.40	0.22
Queue Length 95th (m)	3.3	1.9	7.3	0.3	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	25.1	12.9	16.3	10.6	0.0	0.0	10.2	0.0	0.0
Lane LOS	D	B	C	B			B		
Approach Delay (s)	17.9		16.3	0.1			0.3		
Approach LOS	C		C						

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	46	1368	69	34	1494
Future Volume (Veh/h)	52	46	1368	69	34	1494
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)	52	46	1368	69	34	1494
Pedestrians			1			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						365
pX, platoon unblocked	0.76					
vC, conflicting volume	2184	684			1437	
vC1, stage 1 conf vol	1368					
vC2, stage 2 conf vol	816					
vCu, unblocked vol	1923	684			1437	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	88			93	
cM capacity (veh/h)	191	389			479	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	98	684	684	69	34	747	747
Volume Left	52	0	0	0	34	0	0
Volume Right	46	0	0	69	0	0	0
cSH	251	1700	1700	1700	479	1700	1700
Volume to Capacity	0.39	0.40	0.40	0.04	0.07	0.44	0.44
Queue Length 95th (m)	12.3	0.0	0.0	0.0	1.6	0.0	0.0
Control Delay (s)	28.2	0.0	0.0	0.0	13.1	0.0	0.0
Lane LOS	D				B		
Approach Delay (s)	28.2	0.0			0.3		
Approach LOS	D						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	38	11	1083	1784	6
Future Volume (Veh/h)	21	38	11	1083	1784	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)	21	38	11	1083	1784	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				183	309	
pX, platoon unblocked	0.72	0.65	0.65			
vC, conflicting volume	2350	895	1790			
vC1, stage 1 conf vol	1787					
vC2, stage 2 conf vol	564					
vCu, unblocked vol	1215	0	1136			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	95	97			
cM capacity (veh/h)	171	704	397			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	21	38	11	542	542	1189	601
Volume Left	21	0	11	0	0	0	0
Volume Right	0	38	0	0	0	0	6
cSH	171	704	397	1700	1700	1700	1700
Volume to Capacity	0.12	0.05	0.03	0.32	0.32	0.70	0.35
Queue Length 95th (m)	2.9	1.2	0.6	0.0	0.0	0.0	0.0
Control Delay (s)	29.0	10.4	14.3	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	17.0		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	8	2	1430	946	18
Future Volume (Veh/h)	20	8	2	1430	946	18
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)	20	8	2	1430	946	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				397	203	
pX, platoon unblocked	0.85	0.91	0.91			
vC, conflicting volume	1674	482	964			
vC1, stage 1 conf vol	955					
vC2, stage 2 conf vol	719					
vCu, unblocked vol	961	237	766			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	363	696	768			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	20	8	2	715	715	631	333
Volume Left	20	0	2	0	0	0	0
Volume Right	0	8	0	0	0	0	18
cSH	363	696	768	1700	1700	1700	1700
Volume to Capacity	0.06	0.01	0.00	0.42	0.42	0.37	0.20
Queue Length 95th (m)	1.2	0.2	0.1	0.0	0.0	0.0	0.0
Control Delay (s)	15.5	10.2	9.7	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	14.0		0.0			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	15	9	1303	981	16
Future Volume (Veh/h)	42	15	9	1303	981	16
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)	42	15	9	1303	981	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					384	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1658	498	997			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1553	303	840			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	56	98	99			
cM capacity (veh/h)	95	643	733			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	15	9	652	652	654	343
Volume Left	42	0	9	0	0	0	0
Volume Right	0	15	0	0	0	0	16
cSH	95	643	733	1700	1700	1700	1700
Volume to Capacity	0.44	0.02	0.01	0.38	0.38	0.38	0.20
Queue Length 95th (m)	13.0	0.5	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	69.8	10.7	10.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	A				
Approach Delay (s)	54.2		0.1			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	199	813	230	1737	260	658	200	56	560
Future Volume (vph)	199	813	230	1737	260	658	200	56	560
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA
Protected Phases	5	2	1	6	7	4			8
Permitted Phases	2		6		4		4	8	
Detector Phase	5	2	1	6	7	4	4	8	8
Switch Phase									
Minimum Initial (s)	7.0	8.0	7.0	8.0	7.0	8.0	8.0	8.0	8.0
Minimum Split (s)	11.0	30.1	11.0	30.1	11.0	29.4	29.4	29.4	29.4
Total Split (s)	12.0	56.0	19.0	63.0	16.0	55.0	55.0	39.0	39.0
Total Split (%)	9.2%	43.1%	14.6%	48.5%	12.3%	42.3%	42.3%	30.0%	30.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.1	1.0	2.1	1.0	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	4.0	6.1	4.0	6.4	6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	60.6	50.5	71.0	56.9	51.0	48.6	48.6	32.6	32.6
Actuated g/C Ratio	0.47	0.39	0.55	0.44	0.39	0.37	0.37	0.25	0.25
v/c Ratio	1.18	0.89	0.90	1.13	1.16	0.93	0.30	0.98	0.95
Control Delay	158.2	44.4	69.1	102.1	146.1	53.8	9.7	164.6	64.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.2	44.4	69.1	102.1	146.1	53.8	9.7	164.6	64.1
LOS	F	D	E	F	F	D	A	F	E
Approach Delay		60.5		98.3		67.3			70.2
Approach LOS		E		F		E			E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 64 (49%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 77.4	Intersection LOS: E
Intersection Capacity Utilization 120.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	199	1213	230	1782	260	658	200	56	875
v/c Ratio	1.18	0.89	0.90	1.13	1.16	0.93	0.30	0.98	0.95
Control Delay	158.2	44.4	69.1	102.1	146.1	53.8	9.7	164.6	64.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.2	44.4	69.1	102.1	146.1	53.8	9.7	164.6	64.1
Queue Length 50th (m)	~41.9	133.7	39.0	~257.1	~59.3	114.9	10.5	13.2	99.3
Queue Length 95th (m)	#86.7	#166.3	#80.7	#296.3	#110.0	#208.7	29.0	#39.2	#136.7
Internal Link Dist (m)		119.7		244.5		681.0			237.0
Turn Bay Length (m)	75.0		80.0		130.0			95.0	
Base Capacity (vph)	168	1361	262	1576	224	711	675	57	917
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.89	0.88	1.13	1.16	0.93	0.30	0.98	0.95

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	813	400	230	1737	45	260	658	200	56	560	315
Future Volume (vph)	199	813	400	230	1737	45	260	658	200	56	560	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1		4.0	6.1		4.0	6.4	6.4	6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1767	3384		1767	3599		1767	1902	1560	1785	3419	
Flt Permitted	0.08	1.00		0.07	1.00		0.11	1.00	1.00	0.12	1.00	
Satd. Flow (perm)	147	3384		137	3599		203	1902	1560	231	3419	
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)	199	813	400	230	1737	45	260	658	200	56	560	315
RTOR Reduction (vph)	0	46	0	0	1	0	0	0	93	0	60	0
Lane Group Flow (vph)	199	1167	0	230	1781	0	260	658	107	56	815	0
Confl. Peds. (#/hr)			2	2					1	1		
Heavy Vehicles (%)	1%	3%	0%	1%	1%	2%	1%	1%	1%	0%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		
Actuated Green, G (s)	58.5	50.5		68.9	56.9		48.6	48.6	48.6	32.6	32.6	
Effective Green, g (s)	58.5	50.5		68.9	56.9		48.6	48.6	48.6	32.6	32.6	
Actuated g/C Ratio	0.45	0.39		0.53	0.44		0.37	0.37	0.37	0.25	0.25	
Clearance Time (s)	4.0	6.1		4.0	6.1		4.0	6.4	6.4	6.4	6.4	
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)	165	1314		253	1575		220	711	583	57	857	
v/s Ratio Prot	c0.07	0.34		c0.10	0.49		c0.11	0.35			0.24	
v/s Ratio Perm	c0.47			0.38			c0.33		0.07	0.24		
v/c Ratio	1.21	0.89		0.91	1.13		1.18	0.93	0.18	0.98	0.95	
Uniform Delay, d1	34.1	37.1		38.6	36.5		35.5	39.0	27.4	48.4	47.9	
Progression Factor	1.00	1.00		1.00	1.00		1.37	0.89	1.03	1.00	1.00	
Incremental Delay, d2	136.2	9.2		33.1	67.4		116.0	18.5	0.6	114.3	20.9	
Delay (s)	170.3	46.3		71.6	104.0		164.6	53.0	28.9	162.7	68.8	
Level of Service	F	D		E	F		F	D	C	F	E	
Approach Delay (s)		63.8			100.3			74.6			74.5	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	81.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	120.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	111	1028	51	1214
Future Volume (vph)	111	1028	51	1214
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	22.5	22.5	22.5
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	10.2	44.3	44.3	44.3
Actuated g/C Ratio	0.16	0.68	0.68	0.68
v/c Ratio	0.55	0.47	0.18	0.50
Control Delay	25.6	2.2	4.3	4.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	2.2	4.3	4.1
LOS	C	A	A	A
Approach Delay	25.6	2.2		4.1
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 42 (65%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 4.7	Intersection LOS: A
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	165	1115	51	1214
v/c Ratio	0.55	0.47	0.18	0.50
Control Delay	25.6	2.2	4.3	4.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	2.2	4.3	4.1
Queue Length 50th (m)	13.1	8.4	2.0	27.6
Queue Length 95th (m)	25.7	12.8	m2.6	m42.0
Internal Link Dist (m)	168.5	192.2		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	507	2377	287	2417
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.47	0.18	0.50

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	111	54	1028	87	51	1214
Future Volume (vph)	111	54	1028	87	51	1214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.96		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1736		3476		1785	3544
Flt Permitted	0.97		1.00		0.22	1.00
Satd. Flow (perm)	1736		3476		420	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	54	1028	87	51	1214
RTOR Reduction (vph)	31	0	7	0	0	0
Lane Group Flow (vph)	134	0	1108	0	51	1214
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	10.2		44.3		44.3	44.3
Effective Green, g (s)	10.2		44.3		44.3	44.3
Actuated g/C Ratio	0.16		0.68		0.68	0.68
Clearance Time (s)	6.0		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	272		2369		286	2415
v/s Ratio Prot			0.32			c0.34
v/s Ratio Perm	c0.08				0.12	
v/c Ratio	0.49		0.47		0.18	0.50
Uniform Delay, d1	25.0		4.8		3.8	5.0
Progression Factor	1.00		0.29		0.73	0.69
Incremental Delay, d2	1.4		0.6		0.6	0.4
Delay (s)	26.4		2.0		3.4	3.8
Level of Service	C		A		A	A
Approach Delay (s)	26.4		2.0			3.8
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	79	8	147	13	52	982	157	1223
Future Volume (vph)	79	8	147	13	52	982	157	1223
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	5.0	5.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	24.0	24.0	25.0	25.0	25.0	25.0
Total Split (s)	24.0	24.0	24.0	24.0	41.0	41.0	41.0	41.0
Total Split (%)	36.9%	36.9%	36.9%	36.9%	63.1%	63.1%	63.1%	63.1%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.0	12.0	12.5	12.5	39.5	39.5	39.5	39.5
Actuated g/C Ratio	0.18	0.18	0.19	0.19	0.61	0.61	0.61	0.61
v/c Ratio	0.34	0.12	0.56	0.31	0.27	0.50	0.60	0.58
Control Delay	26.0	10.4	31.4	9.9	12.1	8.5	14.8	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	10.4	31.4	9.9	12.1	8.5	14.8	4.2
LOS	C	B	C	A	B	A	B	A
Approach Delay		20.7		21.8		8.7		5.4
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 9 (14%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: Street F/Doug Leavens Blvd & Ninth Line

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	79	40	147	119	52	1092	157	1276
v/c Ratio	0.34	0.12	0.56	0.31	0.27	0.50	0.60	0.58
Control Delay	26.0	10.4	31.4	9.9	12.1	8.5	14.8	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	10.4	31.4	9.9	12.1	8.5	14.8	4.2
Queue Length 50th (m)	7.8	0.7	15.0	2.7	2.3	29.8	3.5	14.7
Queue Length 95th (m)	16.0	6.3	26.7	12.2	9.9	52.4	#31.1	18.7
Internal Link Dist (m)		160.3		392.7		51.3		359.0
Turn Bay Length (m)			25.0		15.0		80.0	
Base Capacity (vph)	337	459	380	514	192	2196	261	2187
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.09	0.39	0.23	0.27	0.50	0.60	0.58

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	8	32	147	13	106	52	982	110	157	1223	53
Future Volume (vph)	79	8	32	147	13	106	52	982	110	157	1223	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.0	6.0		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	0.95	
Frt	1.00	0.88		1.00	0.87		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1621		1785	1624		1750	3595		1785	3590	
Flt Permitted	0.68	1.00		0.73	1.00		0.17	1.00		0.23	1.00	
Satd. Flow (perm)	1254	1621		1373	1624		318	3595		430	3590	
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)	79	8	32	147	13	106	52	982	110	157	1223	53
RTOR Reduction (vph)	0	26	0	0	73	0	0	11	0	0	4	0
Lane Group Flow (vph)	79	14	0	147	46	0	52	1081	0	157	1272	0
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.0	12.0		12.5	12.5		39.5	39.5		39.5	39.5	
Effective Green, g (s)	12.0	12.0		12.5	12.5		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.18	0.18		0.19	0.19		0.61	0.61		0.61	0.61	
Clearance Time (s)	6.5	6.5		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	3.0	
Lane Grp Cap (vph)	231	299		264	312		193	2184		261	2181	
v/s Ratio Prot		0.01			0.03			0.30			0.35	
v/s Ratio Perm	0.06			c0.11			0.16			c0.37		
v/c Ratio	0.34	0.05		0.56	0.15		0.27	0.50		0.60	0.58	
Uniform Delay, d1	23.1	21.8		23.7	21.8		6.0	7.2		7.9	7.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.48	0.39	
Incremental Delay, d2	0.9	0.1		2.5	0.2		3.4	0.8		9.1	1.1	
Delay (s)	24.0	21.9		26.3	22.0		9.4	8.0		12.9	4.0	
Level of Service	C	C		C	C		A	A		B	A	
Approach Delay (s)		23.2			24.4			8.0			5.0	
Approach LOS		C			C			A			A	

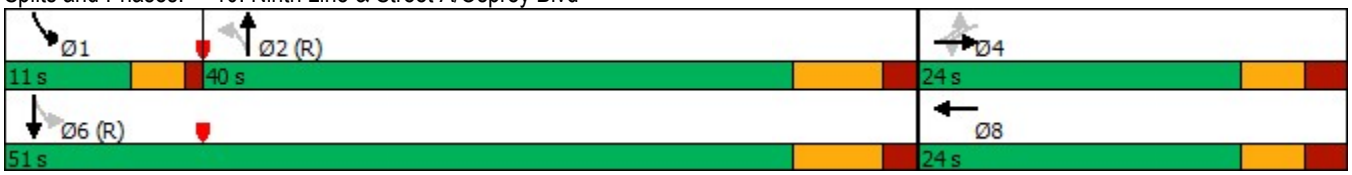
Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	0	270	0	92	1246	40	1220
Future Volume (vph)	55	0	270	0	92	1246	40	1220
Turn Type	Perm	NA	D.Pm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		4		2		6	
Detector Phase	4	4	4	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.0	8.0
Minimum Split (s)	23.5	23.5	23.5	24.0	23.0	23.0	11.0	23.0
Total Split (s)	24.0	24.0	24.0	24.0	40.0	40.0	11.0	51.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	53.3%	53.3%	14.7%	68.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	17.6	17.6	17.6	17.6	37.8	37.8	47.4	44.4
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.50	0.50	0.63	0.59
v/c Ratio	0.17	0.12	0.92	0.06	0.47	0.79	0.15	0.58
Control Delay	24.3	0.9	66.4	0.2	17.1	16.1	6.6	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	0.9	66.4	0.2	17.1	16.1	6.6	11.0
LOS	C	A	E	A	B	B	A	B
Approach Delay		12.6		59.4		16.1		10.9
Approach LOS		B		E		B		B

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 24 (32%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 81.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	55	270	32	92	1429	40	1244
v/c Ratio	0.17	0.12	0.92	0.06	0.47	0.79	0.15	0.58
Control Delay	24.3	0.9	66.4	0.2	17.1	16.1	6.6	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	0.9	66.4	0.2	17.1	16.1	6.6	11.0
Queue Length 50th (m)	5.7	0.0	34.2	0.0	9.9	91.9	1.8	48.5
Queue Length 95th (m)	13.8	1.0	#72.0	0.0	m15.1	m107.2	4.6	64.0
Internal Link Dist (m)		160.3		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	325	464	300	542	195	1810	267	2132
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.12	0.90	0.06	0.47	0.79	0.15	0.58

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	55	270	0	32	92	1246	183	40	1220	24
Future Volume (vph)	55	0	55	270	0	32	92	1246	183	40	1220	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1653	1597		1750	3566		1785	3603	
Flt Permitted	0.74	1.00		0.72	1.00		0.21	1.00		0.10	1.00	
Satd. Flow (perm)	1356	1566		1255	1597		387	3566		187	3603	
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	0	55	270	0	32	92	1246	183	40	1220	24
RTOR Reduction (vph)	0	42	0	0	24	0	0	14	0	0	2	0
Lane Group Flow (vph)	55	13	0	270	8	0	92	1415	0	40	1242	0
Heavy Vehicles (%)	2%	2%	2%	8%	2%	0%	2%	0%	3%	0%	1%	2%
Turn Type	Perm	NA		D.Pm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	17.6	17.6		17.6	17.6		36.2	36.2		44.4	44.4	
Effective Green, g (s)	17.6	17.6		17.6	17.6		36.2	36.2		44.4	44.4	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.48	0.48		0.59	0.59	
Clearance Time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	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)	318	367		294	374		186	1721		200	2132	
v/s Ratio Prot		0.01			0.00			c0.40		0.01	c0.34	
v/s Ratio Perm	0.04			c0.22			0.24			0.11		
v/c Ratio	0.17	0.04		0.92	0.02		0.49	0.82		0.20	0.58	
Uniform Delay, d1	22.9	22.1		28.0	22.1		13.2	16.6		10.9	9.5	
Progression Factor	1.00	1.00		1.00	1.00		0.82	0.84		1.00	1.00	
Incremental Delay, d2	0.3	0.0		31.7	0.0		5.2	2.6		0.5	1.2	
Delay (s)	23.2	22.2		59.7	22.1		16.0	16.6		11.4	10.7	
Level of Service	C	C		E	C		B	B		B	B	
Approach Delay (s)		22.7			55.7			16.6			10.7	
Approach LOS		C			E			B			B	

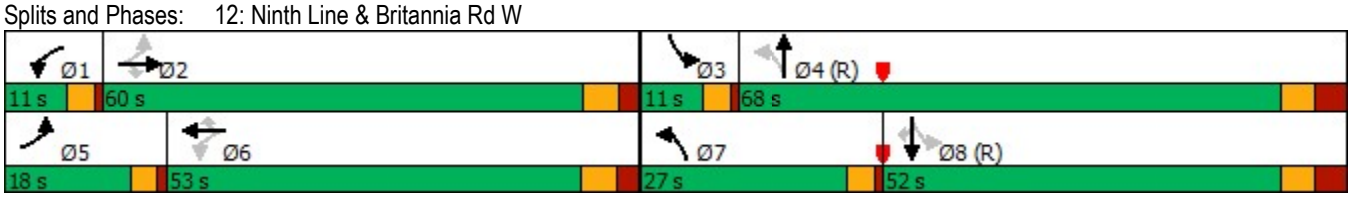
Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	277	695	469	92	1236	101	400	1077	83	1029	340
Future Volume (vph)	277	695	469	92	1236	101	400	1077	83	1029	340
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	3	8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	5	2	2	1	6	6	7	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0	12.0
Minimum Split (s)	11.0	26.5	26.5	11.0	26.7	26.7	11.0	47.7	11.0	47.7	47.7
Total Split (s)	18.0	60.0	60.0	11.0	53.0	53.0	27.0	68.0	11.0	52.0	52.0
Total Split (%)	12.0%	40.0%	40.0%	7.3%	35.3%	35.3%	18.0%	45.3%	7.3%	34.7%	34.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.7	2.7	1.0	3.7	1.0	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7	4.0	7.7	7.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	67.0	53.5	53.5	56.0	46.3	46.3	75.0	60.3	55.0	44.3	44.3
Actuated g/C Ratio	0.45	0.36	0.36	0.37	0.31	0.31	0.50	0.40	0.37	0.30	0.30
v/c Ratio	1.28	0.54	0.59	0.35	1.11	0.17	1.23	0.80	0.56	0.96	0.59
Control Delay	191.9	40.3	12.8	28.9	109.1	1.6	167.9	44.4	42.0	75.6	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	191.9	40.3	12.8	28.9	109.1	1.6	167.9	44.4	42.0	75.6	34.3
LOS	F	D	B	C	F	A	F	D	D	E	C
Approach Delay		60.5			96.4			76.0		64.0	
Approach LOS		E			F			E		E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 74.2	Intersection LOS: E
Intersection Capacity Utilization 118.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	277	695	469	92	1236	101	400	1160	83	1029	340
v/c Ratio	1.28	0.54	0.59	0.35	1.11	0.17	1.23	0.80	0.56	0.96	0.59
Control Delay	191.9	40.3	12.8	28.9	109.1	1.6	167.9	44.4	42.0	75.6	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	191.9	40.3	12.8	28.9	109.1	1.6	167.9	44.4	42.0	75.6	34.3
Queue Length 50th (m)	~81.1	79.6	24.1	14.5	~202.7	0.0	~120.1	145.7	12.1	150.6	54.0
Queue Length 95th (m)	#134.6	97.6	57.5	24.9	#241.8	2.5	#180.5	171.4	m19.3	m#188.0	m82.2
Internal Link Dist (m)		80.1			420.4			341.1		608.8	
Turn Bay Length (m)	80.0		80.0	70.0		70.0	75.0		60.0		60.0
Base Capacity (vph)	216	1288	794	263	1115	583	324	1453	149	1067	581
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.54	0.59	0.35	1.11	0.17	1.23	0.80	0.56	0.96	0.59

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.

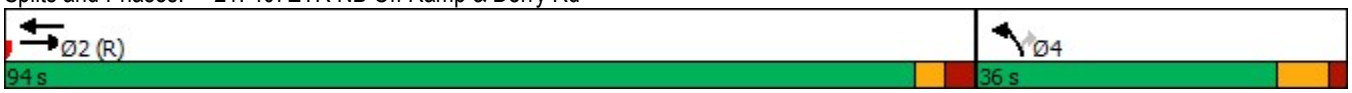
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	695	469	92	1236	101	400	1077	83	83	1029	340
Future Volume (vph)	277	695	469	92	1236	101	400	1077	83	83	1029	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7		4.0	7.7	7.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1767	3614	1597	1785	3614	1551	1767	3607		1716	3614	1581
Flt Permitted	0.08	1.00	1.00	0.29	1.00	1.00	0.08	1.00		0.12	1.00	1.00
Satd. Flow (perm)	147	3614	1597	553	3614	1551	154	3607		219	3614	1581
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)	277	695	469	92	1236	101	400	1077	83	83	1029	340
RTOR Reduction (vph)	0	0	225	0	0	70	0	4	0	0	0	114
Lane Group Flow (vph)	277	695	244	92	1236	31	400	1156	0	83	1029	226
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	3%	1%	0%	0%	4%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	64.5	53.5	53.5	53.3	46.3	46.3	71.3	60.3		51.3	44.3	44.3
Effective Green, g (s)	64.5	53.5	53.5	53.3	46.3	46.3	71.3	60.3		51.3	44.3	44.3
Actuated g/C Ratio	0.43	0.36	0.36	0.36	0.31	0.31	0.48	0.40		0.34	0.30	0.30
Clearance Time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7		4.0	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	214	1288	569	253	1115	478	320	1450		144	1067	466
v/s Ratio Prot	c0.12	0.19		0.02	0.34		c0.19	0.32		0.03	0.28	
v/s Ratio Perm	c0.43		0.15	0.11		0.02	c0.40			0.17		0.14
v/c Ratio	1.29	0.54	0.43	0.36	1.11	0.07	1.25	0.80		0.58	0.96	0.48
Uniform Delay, d1	46.1	38.4	36.7	33.3	51.9	36.6	49.0	39.5		36.2	52.1	43.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.36	1.13	1.35
Incremental Delay, d2	162.6	1.6	2.4	0.9	61.9	0.3	135.8	4.7		4.3	17.2	2.8
Delay (s)	208.7	40.1	39.0	34.2	113.7	36.8	184.8	44.1		53.4	76.2	61.3
Level of Service	F	D	D	C	F	D	F	D		D	E	E
Approach Delay (s)		72.1			103.2			80.2			71.4	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	81.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	118.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1157	2247	67	392
Future Volume (vph)	1157	2247	67	392
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	94.0	94.0	36.0	36.0
Total Split (%)	72.3%	72.3%	27.7%	27.7%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	88.0	88.0	29.0	29.0
Actuated g/C Ratio	0.68	0.68	0.22	0.22
v/c Ratio	0.48	0.92	0.09	0.88
Control Delay	10.8	25.6	40.5	56.5
Queue Delay	0.0	18.5	0.0	0.0
Total Delay	10.8	44.1	40.5	56.5
LOS	B	D	D	E
Approach Delay	10.8	44.1	54.2	
Approach LOS	B	D	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 35.3	Intersection LOS: D
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1157	2247	67	392
v/c Ratio	0.48	0.92	0.09	0.88
Control Delay	10.8	25.6	40.5	56.5
Queue Delay	0.0	18.5	0.0	0.0
Total Delay	10.8	44.1	40.5	56.5
Queue Length 50th (m)	63.0	219.2	6.4	66.4
Queue Length 95th (m)	75.8	260.7	12.2	#117.6
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2422	2446	749	444
Starvation Cap Reductn	0	273	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.48	1.03	0.09	0.88

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1157	0	0	2247	67	392
Future Volume (vph)	1157	0	0	2247	67	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3614	3362	1597
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3614	3362	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1157	0	0	2247	67	392
RTOR Reduction (vph)	0	0	0	0	0	89
Lane Group Flow (vph)	1157	0	0	2247	67	303
Heavy Vehicles (%)	2%	0%	0%	1%	3%	0%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	88.0			88.0	29.0	29.0
Effective Green, g (s)	88.0			88.0	29.0	29.0
Actuated g/C Ratio	0.68			0.68	0.22	0.22
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2422			2446	749	356
v/s Ratio Prot	0.32			c0.62	0.02	
v/s Ratio Perm						c0.19
v/c Ratio	0.48			0.92	0.09	0.85
Uniform Delay, d1	10.0			17.9	40.0	48.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			7.0	0.2	21.9
Delay (s)	10.7			24.9	40.3	70.4
Level of Service	B			C	D	E
Approach Delay (s)	10.7			24.9	66.0	
Approach LOS	B			C	E	

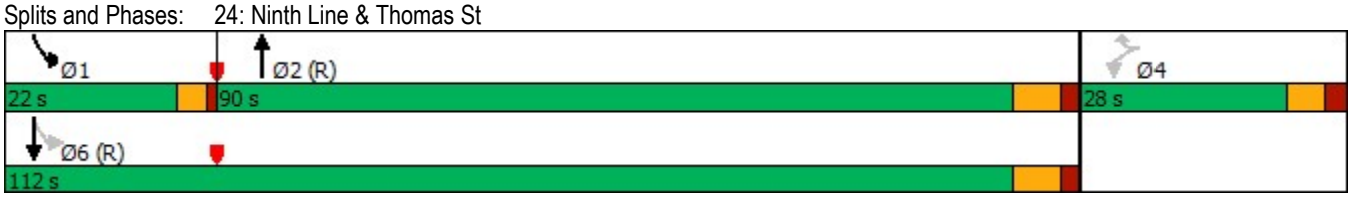
Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	167	277	1680	213	1281
Future Volume (vph)	167	277	1680	213	1281
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	28.0	28.0	90.0	22.0	112.0
Total Split (%)	20.0%	20.0%	64.3%	15.7%	80.0%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	17.9	17.9	89.0	111.6	108.6
Actuated g/C Ratio	0.13	0.13	0.64	0.80	0.78
v/c Ratio	0.75	0.73	0.81	0.83	0.46
Control Delay	79.3	26.2	14.7	61.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	26.2	14.7	61.5	6.4
LOS	E	C	B	E	A
Approach Delay	46.2		14.7		14.2
Approach LOS	D		B		B

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 25 (18%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 87.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	167	277	1842	213	1281
v/c Ratio	0.75	0.73	0.81	0.83	0.46
Control Delay	79.3	26.2	14.7	61.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	26.2	14.7	61.5	6.4
Queue Length 50th (m)	41.5	14.8	134.1	36.4	53.3
Queue Length 95th (m)	63.2	43.2	160.4	#69.1	70.0
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	267	414	2272	287	2777
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.63	0.67	0.81	0.74	0.46

Intersection Summary

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

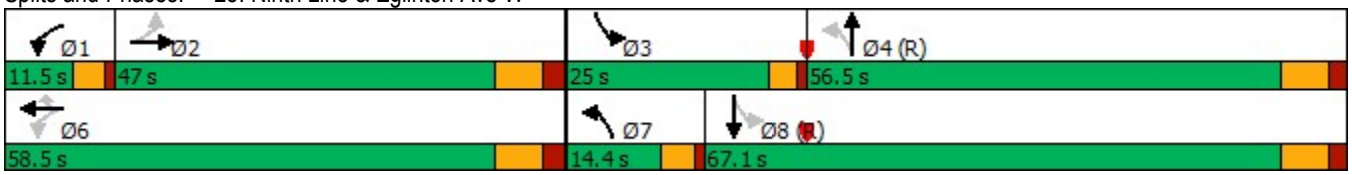
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	167	277	1680	162	213	1281
Future Volume (vph)	167	277	1680	162	213	1281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1744	1521	3569		1767	3579
Flt Permitted	0.95	1.00	1.00		0.05	1.00
Satd. Flow (perm)	1744	1521	3569		89	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	277	1680	162	213	1281
RTOR Reduction (vph)	0	187	5	0	0	0
Lane Group Flow (vph)	167	90	1837	0	213	1281
Confl. Peds. (#/hr)	6					
Heavy Vehicles (%)	1%	5%	1%	0%	1%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	17.9	17.9	88.9		108.6	108.6
Effective Green, g (s)	17.9	17.9	88.9		108.6	108.6
Actuated g/C Ratio	0.13	0.13	0.64		0.78	0.78
Clearance Time (s)	6.5	6.5	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	222	194	2266		257	2776
v/s Ratio Prot			0.51		c0.09	0.36
v/s Ratio Perm	c0.10	0.06			c0.55	
v/c Ratio	0.75	0.47	0.81		0.83	0.46
Uniform Delay, d1	58.9	56.6	19.2		45.1	5.5
Progression Factor	1.00	1.00	0.61		1.00	1.00
Incremental Delay, d2	13.4	1.8	2.1		19.3	0.6
Delay (s)	72.3	58.4	13.7		64.4	6.0
Level of Service	E	E	B		E	A
Approach Delay (s)	63.6		13.7			14.4
Approach LOS	E		B			B

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	54	554	133	694	537	103	1218	374	975
Future Volume (vph)	54	554	133	694	537	103	1218	374	975
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases		2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	11.0	40.0
Total Split (s)	47.0	47.0	11.5	58.5	58.5	14.4	56.5	25.0	67.1
Total Split (%)	33.6%	33.6%	8.2%	41.8%	41.8%	10.3%	40.4%	17.9%	47.9%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	39.5	39.5	54.0	51.0	51.0	60.9	49.5	77.5	61.1
Actuated g/C Ratio	0.28	0.28	0.39	0.36	0.36	0.44	0.35	0.55	0.44
v/c Ratio	1.02	1.16	0.93	1.00	0.72	0.42	1.12	1.17	0.65
Control Delay	179.7	135.0	91.5	79.1	23.6	21.6	105.7	139.5	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Total Delay	179.7	135.0	91.5	79.1	23.6	21.6	105.7	139.5	28.5
LOS	F	F	F	E	C	C	F	F	C
Approach Delay		138.6		58.5			100.0		58.2
Approach LOS		F		E			F		E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 69 (49%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 81.9	Intersection LOS: F
Intersection Capacity Utilization 125.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	608	133	694	537	103	1410	374	1024
v/c Ratio	1.02	1.16	0.93	1.00	0.72	0.42	1.12	1.17	0.65
Control Delay	179.7	135.0	91.5	79.1	23.6	21.6	105.7	139.5	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Total Delay	179.7	135.0	91.5	79.1	23.6	21.6	105.7	139.5	28.5
Queue Length 50th (m)	~14.0	~182.6	22.4	~177.0	58.2	12.1	~216.3	~100.4	82.8
Queue Length 95th (m)	#40.9	#249.7	#56.1	#252.2	99.3	20.7	#256.1 m	#147.6	86.7
Internal Link Dist (m)		373.3		388.7			291.0		162.9
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	53	525	143	692	748	261	1261	321	1569
Starvation Cap Reductn	0	0	0	0	0	0	0	0	249
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	1.02	1.16	0.93	1.00	0.72	0.39	1.12	1.17	0.78

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	554	54	133	694	537	103	1218	192	374	975	49
Future Volume (vph)	54	554	54	133	694	537	103	1218	192	374	975	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	1855		1750	1902	1566	1785	3540		1767	3590	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.19	1.00		0.07	1.00	
Satd. Flow (perm)	190	1855		167	1902	1566	365	3540		139	3590	
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)	54	554	54	133	694	537	103	1218	192	374	975	49
RTOR Reduction (vph)	0	2	0	0	0	178	0	9	0	0	3	0
Lane Group Flow (vph)	54	606	0	133	694	359	103	1401	0	374	1021	0
Heavy Vehicles (%)	0%	2%	4%	2%	1%	2%	0%	1%	1%	1%	1%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	39.5	39.5		51.0	51.0	51.0	58.4	49.5		74.5	61.1	
Effective Green, g (s)	39.5	39.5		51.0	51.0	51.0	58.4	49.5		74.5	61.1	
Actuated g/C Ratio	0.28	0.28		0.36	0.36	0.36	0.42	0.35		0.53	0.44	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	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)	53	523		139	692	570	242	1251		318	1566	
v/s Ratio Prot		c0.33		0.05	c0.36		0.03	0.40		c0.18	0.28	
v/s Ratio Perm	0.28			0.30		0.23	0.15			c0.45		
v/c Ratio	1.02	1.16		0.96	1.00	0.63	0.43	1.12		1.18	0.65	
Uniform Delay, d1	50.2	50.2		38.0	44.5	36.7	26.3	45.2		46.5	31.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.26	0.84	
Incremental Delay, d2	129.1	91.0		62.6	34.9	5.2	1.2	65.1		98.7	1.4	
Delay (s)	179.4	141.2		100.5	79.4	41.9	27.5	110.3		157.3	27.5	
Level of Service	F	F		F	E	D	C	F		F	C	
Approach Delay (s)		144.4			66.7			104.7			62.2	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	87.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	125.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	97	1751	56	1425
Future Volume (vph)	97	1751	56	1425
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	24.0	24.0	24.0
Total Split (s)	24.0	46.0	46.0	46.0
Total Split (%)	34.3%	65.7%	65.7%	65.7%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.1	45.9	45.9	45.9
Actuated g/C Ratio	0.17	0.66	0.66	0.66
v/c Ratio	0.60	0.78	0.53	0.61
Control Delay	31.4	4.0	25.6	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	4.0	25.6	6.2
LOS	C	A	C	A
Approach Delay	31.4	4.0		6.9
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 32 (46%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	189	1822	56	1425
v/c Ratio	0.60	0.78	0.53	0.61
Control Delay	31.4	4.0	25.6	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	4.0	25.6	6.2
Queue Length 50th (m)	19.2	3.1	2.6	36.5
Queue Length 95th (m)	33.1	19.2	m#22.0	53.5
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	462	2335	106	2344
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.78	0.53	0.61

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.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	97	92	1751	71	56	1425
Future Volume (vph)	97	92	1751	71	56	1425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.93		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1750		3560		1785	3579
Flt Permitted	0.97		1.00		0.09	1.00
Satd. Flow (perm)	1750		3560		164	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	92	1751	71	56	1425
RTOR Reduction (vph)	14	0	3	0	0	0
Lane Group Flow (vph)	175	0	1819	0	56	1425
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.1		45.9		45.9	45.9
Effective Green, g (s)	12.1		45.9		45.9	45.9
Actuated g/C Ratio	0.17		0.66		0.66	0.66
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	302		2334		107	2346
v/s Ratio Prot			c0.51			0.40
v/s Ratio Perm	c0.10				0.34	
v/c Ratio	0.58		0.78		0.52	0.61
Uniform Delay, d1	26.6		8.5		6.3	6.9
Progression Factor	1.00		0.29		0.84	0.68
Incremental Delay, d2	2.7		1.2		15.5	1.1
Delay (s)	29.3		3.7		20.8	5.7
Level of Service	C		A		C	A
Approach Delay (s)	29.3		3.7			6.3
Approach LOS	C		A			A

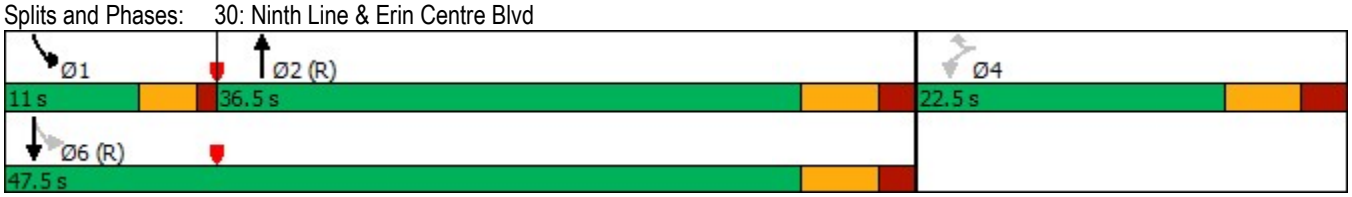
Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	114	158	1680	143	1322
Future Volume (vph)	114	158	1680	143	1322
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	22.5	22.5	36.5	11.0	47.5
Total Split (%)	32.1%	32.1%	52.1%	15.7%	67.9%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.2	10.2	37.8	49.3	47.3
Actuated g/C Ratio	0.15	0.15	0.54	0.70	0.68
v/c Ratio	0.44	0.43	0.93	0.47	0.54
Control Delay	32.3	8.8	28.5	17.7	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	8.8	28.5	17.7	5.0
LOS	C	A	C	B	A
Approach Delay	18.7		28.5		6.2
Approach LOS	B		C		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 68 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 78.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	114	158	1786	143	1322
v/c Ratio	0.44	0.43	0.93	0.47	0.54
Control Delay	32.3	8.8	28.5	17.7	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	8.8	28.5	17.7	5.0
Queue Length 50th (m)	12.9	0.0	117.4	8.4	16.6
Queue Length 95th (m)	24.2	12.4	#275.4	21.8	41.5
Internal Link Dist (m)	358.4		377.1		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	405	486	1924	303	2443
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.33	0.93	0.47	0.54

Intersection Summary

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

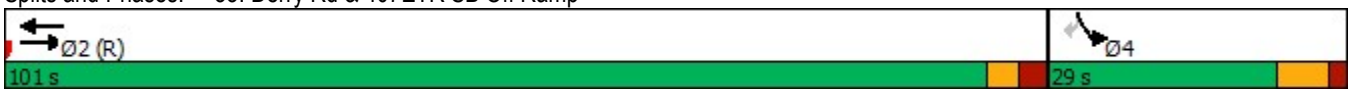
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	114	158	1680	106	143	1322
Future Volume (vph)	114	158	1680	106	143	1322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1776	1597	3556		1767	3614
Flt Permitted	0.95	1.00	1.00		0.10	1.00
Satd. Flow (perm)	1776	1597	3556		181	3614
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	114	158	1680	106	143	1322
RTOR Reduction (vph)	0	135	6	0	0	0
Lane Group Flow (vph)	114	23	1780	0	143	1322
Confl. Peds. (#/hr)	4			1	1	
Heavy Vehicles (%)	0%	0%	1%	11%	1%	1%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	10.2	10.2	37.0		47.3	47.3
Effective Green, g (s)	10.2	10.2	37.0		47.3	47.3
Actuated g/C Ratio	0.15	0.15	0.53		0.68	0.68
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	258	232	1879		265	2442
v/s Ratio Prot			c0.50		0.05	c0.37
v/s Ratio Perm	c0.06	0.01			0.32	
v/c Ratio	0.44	0.10	0.95		0.54	0.54
Uniform Delay, d1	27.3	25.9	15.6		13.6	5.8
Progression Factor	1.00	1.00	1.19		2.72	0.70
Incremental Delay, d2	1.2	0.2	10.1		1.7	0.7
Delay (s)	28.5	26.1	28.7		38.6	4.7
Level of Service	C	C	C		D	A
Approach Delay (s)	27.1		28.7			8.0
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1265	2214	361	180
Future Volume (vph)	1265	2214	361	180
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	101.0	101.0	29.0	29.0
Total Split (%)	77.7%	77.7%	22.3%	22.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	98.3	98.3	18.7	18.7
Actuated g/C Ratio	0.76	0.76	0.14	0.14
v/c Ratio	0.48	0.81	0.73	0.74
Control Delay	7.0	13.6	62.3	66.1
Queue Delay	0.0	0.6	0.0	0.0
Total Delay	7.0	14.2	62.3	66.1
LOS	A	B	E	E
Approach Delay	7.0	14.2	63.6	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1265	2214	361	180
v/c Ratio	0.48	0.81	0.73	0.74
Control Delay	7.0	13.6	62.3	66.1
Queue Delay	0.0	0.6	0.0	0.0
Total Delay	7.0	14.2	62.3	66.1
Queue Length 50th (m)	52.3	151.9	42.4	37.3
Queue Length 95th (m)	70.5	201.7	56.0	59.0
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	2654	2733	580	284
Starvation Cap Reductn	0	194	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.48	0.87	0.62	0.63

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1265	2214	0	361	180
Future Volume (vph)	0	1265	2214	0	361	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3510	3614		3429	1597
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3510	3614		3429	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1265	2214	0	361	180
RTOR Reduction (vph)	0	0	0	0	0	15
Lane Group Flow (vph)	0	1265	2214	0	361	165
Heavy Vehicles (%)	0%	4%	1%	0%	1%	0%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		98.3	98.3		18.7	18.7
Effective Green, g (s)		98.3	98.3		18.7	18.7
Actuated g/C Ratio		0.76	0.76		0.14	0.14
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2654	2732		493	229
v/s Ratio Prot		0.36	c0.61		c0.11	
v/s Ratio Perm						0.10
v/c Ratio		0.48	0.81		0.73	0.72
Uniform Delay, d1		6.0	10.0		53.3	53.2
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6	2.7		5.6	10.7
Delay (s)		6.7	12.7		58.8	63.9
Level of Service		A	B		E	E
Approach Delay (s)		6.7	12.7		60.5	
Approach LOS		A	B		E	

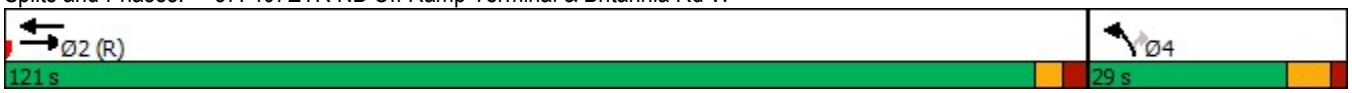
Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1419	1882	123	118
Future Volume (vph)	1419	1882	123	118
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	121.0	121.0	29.0	29.0
Total Split (%)	80.7%	80.7%	19.3%	19.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	121.2	121.2	15.8	15.8
Actuated g/C Ratio	0.81	0.81	0.11	0.11
v/c Ratio	0.49	0.64	0.67	0.47
Control Delay	5.5	7.5	81.3	23.1
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	5.5	8.7	81.3	23.1
LOS	A	A	F	C
Approach Delay	5.5	8.7	52.8	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 69.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp Terminal & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1419	1882	123	118
v/c Ratio	0.49	0.64	0.67	0.47
Control Delay	5.5	7.5	81.3	23.1
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	5.5	8.7	81.3	23.1
Queue Length 50th (m)	54.6	91.5	33.0	6.1
Queue Length 95th (m)	79.7	132.8	51.0	23.3
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2919	2919	256	312
Starvation Cap Reductn	0	740	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.86	0.48	0.38

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1419	0	0	1882	123	118
Future Volume (vph)	1419	0	0	1882	123	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3614	1750	1581
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3614	1750	1581
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1419	0	0	1882	123	118
RTOR Reduction (vph)	0	0	0	0	0	84
Lane Group Flow (vph)	1419	0	0	1882	123	34
Heavy Vehicles (%)	1%	0%	0%	1%	2%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	121.2			121.2	15.8	15.8
Effective Green, g (s)	121.2			121.2	15.8	15.8
Actuated g/C Ratio	0.81			0.81	0.11	0.11
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2920			2920	184	166
v/s Ratio Prot	0.39			c0.52	c0.07	
v/s Ratio Perm						0.02
v/c Ratio	0.49			0.64	0.67	0.20
Uniform Delay, d1	4.6			5.8	64.6	61.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.6			1.1	8.9	0.6
Delay (s)	5.1			6.9	73.4	62.0
Level of Service	A			A	E	E
Approach Delay (s)	5.1			6.9	67.8	
Approach LOS	A			A	E	

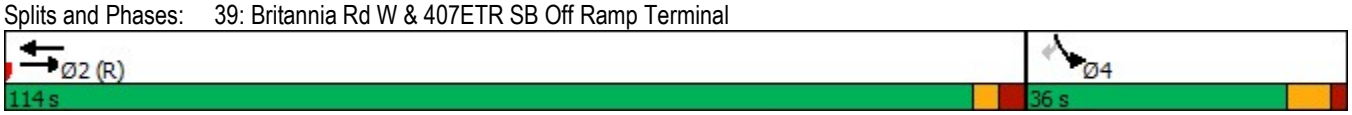
Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1412	1888	164	173
Future Volume (vph)	1412	1888	164	173
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	114.0	114.0	36.0	36.0
Total Split (%)	76.0%	76.0%	24.0%	24.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	108.0	108.0	29.0	29.0
Actuated g/C Ratio	0.72	0.72	0.19	0.19
v/c Ratio	0.54	0.73	0.48	0.54
Control Delay	10.6	14.4	59.2	51.0
Queue Delay	0.0	0.8	0.0	0.0
Total Delay	10.6	15.2	59.2	51.0
LOS	B	B	E	D
Approach Delay	10.6	15.2	55.0	
Approach LOS	B	B	D	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp Terminal



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1412	1888	164	173
v/c Ratio	0.54	0.73	0.48	0.54
Control Delay	10.6	14.4	59.2	51.0
Queue Delay	0.0	0.8	0.0	0.0
Total Delay	10.6	15.2	59.2	51.0
Queue Length 50th (m)	85.4	145.7	40.4	35.1
Queue Length 95th (m)	99.4	167.6	62.1	58.1
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2602	2602	341	322
Starvation Cap Reductn	0	374	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.85	0.48	0.54

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1412	1888	0	164	173
Future Volume (vph)	0	1412	1888	0	164	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3614		1767	1536
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3614		1767	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1412	1888	0	164	173
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	0	1412	1888	0	164	147
Heavy Vehicles (%)	0%	1%	1%	0%	1%	4%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		108.0	108.0		29.0	29.0
Effective Green, g (s)		108.0	108.0		29.0	29.0
Actuated g/C Ratio		0.72	0.72		0.19	0.19
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2602	2602		341	296
v/s Ratio Prot		0.39	c0.52		0.09	
v/s Ratio Perm						c0.10
v/c Ratio		0.54	0.73		0.48	0.50
Uniform Delay, d1		9.7	12.3		53.8	54.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8	1.8		4.8	5.9
Delay (s)		10.5	14.1		58.6	59.9
Level of Service		B	B		E	E
Approach Delay (s)		10.5	14.1		59.2	
Approach LOS		B	B		E	

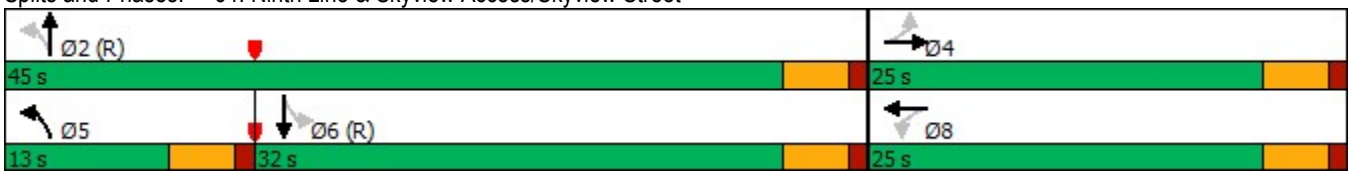
Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	78	5	4	5	293	1630	14	1255
Future Volume (vph)	78	5	4	5	293	1630	14	1255
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	9.5	24.0	24.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	13.0	45.0	32.0	32.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	18.6%	64.3%	45.7%	45.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.3	9.3	9.3	9.3	51.7	51.7	34.0	34.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.74	0.74	0.49	0.49
v/c Ratio	0.42	0.52	0.04	0.04	0.67	0.63	0.10	0.82
Control Delay	34.0	10.3	25.0	20.1	19.7	10.4	18.1	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	19.7	10.4	18.1	26.4
LOS	C	B	C	C	B	B	B	C
Approach Delay		17.1		21.6		11.8		26.4
Approach LOS		B		C		B		C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 78.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 64: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	78	194	4	9	293	1635	14	1375
v/c Ratio	0.42	0.52	0.04	0.04	0.67	0.63	0.10	0.82
Control Delay	34.0	10.3	25.0	20.1	19.7	10.4	18.1	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	19.7	10.4	18.1	26.4
Queue Length 50th (m)	8.8	0.5	0.4	0.6	40.6	118.3	1.4	86.7
Queue Length 95th (m)	18.4	14.4	2.5	3.6	m49.8	m112.8	m2.6	#131.7
Internal Link Dist (m)		135.4		141.5		162.9		150.2
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	405	594	238	506	436	2584	134	1684
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.33	0.02	0.02	0.67	0.63	0.10	0.82

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	5	189	4	5	4	293	1630	5	14	1255	120
Future Volume (vph)	78	5	189	4	5	4	293	1630	5	14	1255	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1573		1750	1719		1750	3498		1750	3454	
Flt Permitted	0.75	1.00		0.44	1.00		0.10	1.00		0.15	1.00	
Satd. Flow (perm)	1385	1573		814	1719		191	3498		278	3454	
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)	78	5	189	4	5	4	293	1630	5	14	1255	120
RTOR Reduction (vph)	0	164	0	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	78	30	0	4	6	0	293	1635	0	14	1366	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Effective Green, g (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.49	0.49	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	208		108	228		435	2583		135	1677	
v/s Ratio Prot		0.02			0.00		0.13	c0.47			c0.40	
v/s Ratio Perm	c0.06			0.00			0.37			0.05		
v/c Ratio	0.42	0.14		0.04	0.02		0.67	0.63		0.10	0.81	
Uniform Delay, d1	27.9	26.8		26.4	26.4		15.3	4.5		9.7	15.3	
Progression Factor	1.00	1.00		1.00	1.00		1.52	2.01		1.30	1.35	
Incremental Delay, d2	1.6	0.3		0.1	0.0		1.5	0.4		1.3	3.9	
Delay (s)	29.5	27.2		26.6	26.4		24.8	9.4		14.0	24.6	
Level of Service	C	C		C	C		C	A		B	C	
Approach Delay (s)		27.8			26.5			11.8			24.5	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Site Access

04/22/2021

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	22	38	1793	1417	20
Future Volume (Veh/h)	12	22	38	1793	1417	20
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	22	38	1793	1417	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				174	401	
pX, platoon unblocked	0.84	0.80	0.80			
vC, conflicting volume	2400	718	1437			
vC1, stage 1 conf vol	1427					
vC2, stage 2 conf vol	972					
vCu, unblocked vol	1211	141	1041			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	93			
cM capacity (veh/h)	232	703	530			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	22	38	896	896	945	492
Volume Left	12	0	38	0	0	0	0
Volume Right	0	22	0	0	0	0	20
cSH	232	703	530	1700	1700	1700	1700
Volume to Capacity	0.05	0.03	0.07	0.53	0.53	0.56	0.29
Queue Length 95th (m)	1.1	0.7	1.6	0.0	0.0	0.0	0.0
Control Delay (s)	21.4	10.3	12.3	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	14.2		0.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	25	22	0	17	32	1253	60	42	1245	120
Future Volume (Veh/h)	18	0	25	22	0	17	32	1253	60	42	1245	120
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)	18	0	25	22	0	17	32	1253	60	42	1245	120
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.67	0.67		0.67	0.67	0.67				0.67		
vC, conflicting volume	2096	2766	682	2078	2796	656	1365			1313		
vC1, stage 1 conf vol	1389	1389		1347	1347							
vC2, stage 2 conf vol	708	1377		732	1449							
vCu, unblocked vol	1653	2651	682	1626	2696	0	1365			485		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	94	90	100	98	94			94		
cM capacity (veh/h)	135	151	392	215	131	732	499			721		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	18	25	39	32	835	478	42	830	535
Volume Left	18	0	22	32	0	0	42	0	0
Volume Right	0	25	17	0	0	60	0	0	120
cSH	135	392	311	499	1700	1700	721	1700	1700
Volume to Capacity	0.13	0.06	0.13	0.06	0.49	0.28	0.06	0.49	0.31
Queue Length 95th (m)	3.1	1.4	3.0	1.4	0.0	0.0	1.3	0.0	0.0
Control Delay (s)	35.7	14.8	18.3	12.7	0.0	0.0	10.3	0.0	0.0
Lane LOS	E	B	C	B			B		
Approach Delay (s)	23.6		18.3	0.3			0.3		
Approach LOS	C		C						

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	94	43	1652	205	25	1411
Future Volume (Veh/h)	94	43	1652	205	25	1411
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)	94	43	1652	205	25	1411
Pedestrians			1			
Lane Width (m)			3.7			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						365
pX, platoon unblocked	0.74					
vC, conflicting volume	2511	928			1857	
vC1, stage 1 conf vol	1754					
vC2, stage 2 conf vol	756					
vCu, unblocked vol	2335	928			1857	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	23	84			92	
cM capacity (veh/h)	122	273			330	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	137	1101	756	25	706	706
Volume Left	94	0	0	25	0	0
Volume Right	43	0	205	0	0	0
cSH	147	1700	1700	330	1700	1700
Volume to Capacity	0.93	0.65	0.44	0.08	0.41	0.41
Queue Length 95th (m)	45.8	0.0	0.0	1.7	0.0	0.0
Control Delay (s)	115.7	0.0	0.0	16.8	0.0	0.0
Lane LOS	F			C		
Approach Delay (s)	115.7	0.0		0.3		
Approach LOS	F					

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	15	28	1181	1360	46
Future Volume (Veh/h)	25	15	28	1181	1360	46
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)	25	15	28	1181	1360	46
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					397	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	2030	703	1406			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1766	80	974			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	55	98	95			
cM capacity (veh/h)	56	758	554			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	25	15	28	590	590	907	499
Volume Left	25	0	28	0	0	0	0
Volume Right	0	15	0	0	0	0	46
cSH	56	758	554	1700	1700	1700	1700
Volume to Capacity	0.45	0.02	0.05	0.35	0.35	0.53	0.29
Queue Length 95th (m)	11.8	0.4	1.1	0.0	0.0	0.0	0.0
Control Delay (s)	113.5	9.8	11.8	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	74.6		0.3			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	5	8	1102	1353	57
Future Volume (Veh/h)	12	5	8	1102	1353	57
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	5	8	1102	1353	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				383	216	
pX, platoon unblocked	0.88	0.82	0.82			
vC, conflicting volume	1948	705	1410			
vC1, stage 1 conf vol	1382					
vC2, stage 2 conf vol	567					
vCu, unblocked vol	1267	217	1072			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	98			
cM capacity (veh/h)	240	649	533			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	5	8	551	551	902	508
Volume Left	12	0	8	0	0	0	0
Volume Right	0	5	0	0	0	0	57
cSH	240	649	533	1700	1700	1700	1700
Volume to Capacity	0.05	0.01	0.02	0.32	0.32	0.53	0.30
Queue Length 95th (m)	1.1	0.2	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	20.8	10.6	11.9	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	17.8		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

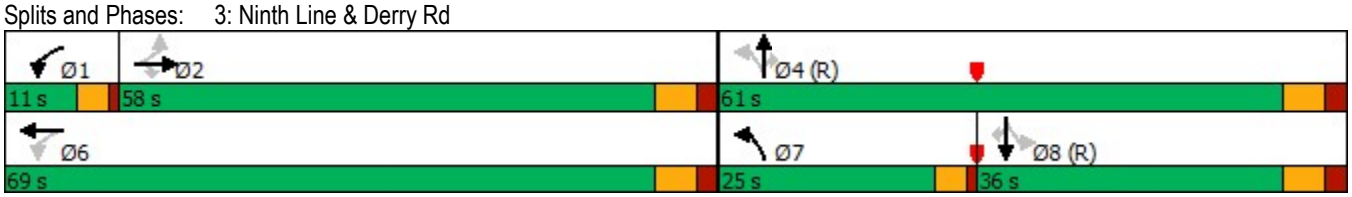
Appendix F

2031 Synchro Results – Scenario 3

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	209	1389	178	151	624	400	535	323	23	556	277
Future Volume (vph)	209	1389	178	151	624	400	535	323	23	556	277
Turn Type	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6	7	4			8	
Permitted Phases	2		2	6		4		4	8		8
Detector Phase	2	2	2	1	6	7	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0	7.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.1	30.1	30.1	11.0	30.1	11.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	58.0	58.0	58.0	11.0	69.0	25.0	61.0	61.0	36.0	36.0	36.0
Total Split (%)	44.6%	44.6%	44.6%	8.5%	53.1%	19.2%	46.9%	46.9%	27.7%	27.7%	27.7%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.1	2.1	2.1	1.0	2.1	1.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	4.0	6.1	4.0	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lag	Lag	Lag	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	Max	Max	Max	None	Max	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	51.9	51.9	51.9	65.0	62.9	57.0	54.6	54.6	29.6	29.6	29.6
Actuated g/C Ratio	0.40	0.40	0.40	0.50	0.48	0.44	0.42	0.42	0.23	0.23	0.23
v/c Ratio	0.74	0.96	0.26	1.00	0.40	1.02	0.67	0.44	0.12	0.68	0.56
Control Delay	51.5	54.7	12.9	101.0	22.0	79.6	32.4	16.3	42.0	50.6	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	54.7	12.9	101.0	22.0	79.6	32.4	16.3	42.0	50.6	20.8
LOS	D	D	B	F	C	E	C	B	D	D	C
Approach Delay		50.2			36.6		43.3			40.7	
Approach LOS		D			D		D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 43 (33%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 44.2	Intersection LOS: D
Intersection Capacity Utilization 101.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	209	1389	178	151	668	400	535	323	23	556	277
v/c Ratio	0.74	0.96	0.26	1.00	0.40	1.02	0.67	0.44	0.12	0.68	0.56
Control Delay	51.5	54.7	12.9	101.0	22.0	79.6	32.4	16.3	42.0	50.6	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	54.7	12.9	101.0	22.0	79.6	32.4	16.3	42.0	50.6	20.8
Queue Length 50th (m)	41.7	166.5	12.1	21.5	51.0	~84.0	94.5	36.3	4.3	63.4	20.0
Queue Length 95th (m)	#78.6	#211.4	26.9	#61.9	64.5	#132.6	135.6	65.1	11.7	81.5	46.3
Internal Link Dist (m)		119.7			244.5		681.0			237.0	
Turn Bay Length (m)	75.0		40.0	80.0		130.0			95.0		65.0
Base Capacity (vph)	281	1442	695	151	1687	394	798	737	188	822	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.96	0.26	1.00	0.40	1.02	0.67	0.44	0.12	0.68	0.56

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	1389	178	151	624	44	400	535	323	23	556	277
Future Volume (vph)	209	1389	178	151	624	44	400	535	323	23	556	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.1	6.1	6.1	4.0	6.1		4.0	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	3614	1597	1733	3479		1750	1902	1566	1716	3614	1581
Flt Permitted	0.40	1.00	1.00	0.07	1.00		0.22	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	705	3614	1597	131	3479		402	1902	1566	826	3614	1581
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)	209	1389	178	151	624	44	400	535	323	23	556	277
RTOR Reduction (vph)	0	0	58	0	4	0	0	0	80	0	0	136
Lane Group Flow (vph)	209	1389	120	151	664	0	400	535	243	23	556	141
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2		2	6			4		4	8		8
Actuated Green, G (s)	51.9	51.9	51.9	62.9	62.9		54.6	54.6	54.6	29.6	29.6	29.6
Effective Green, g (s)	51.9	51.9	51.9	62.9	62.9		54.6	54.6	54.6	29.6	29.6	29.6
Actuated g/C Ratio	0.40	0.40	0.40	0.48	0.48		0.42	0.42	0.42	0.23	0.23	0.23
Clearance Time (s)	6.1	6.1	6.1	4.0	6.1		4.0	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	1442	637	149	1683		386	798	657	188	822	359
v/s Ratio Prot		0.38		c0.05	0.19		c0.17	0.28			0.15	
v/s Ratio Perm	0.30		0.08	c0.44			c0.27		0.16	0.03		0.09
v/c Ratio	0.74	0.96	0.19	1.01	0.39		1.04	0.67	0.37	0.12	0.68	0.39
Uniform Delay, d1	33.4	38.1	25.4	34.0	21.4		30.5	30.4	25.9	39.9	45.8	42.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.25	0.93	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.3	16.4	0.7	77.3	0.7		50.9	3.6	1.3	1.3	4.4	3.2
Delay (s)	49.7	54.5	26.0	111.3	22.1		89.1	31.8	27.1	41.2	50.3	45.8
Level of Service	D	D	C	F	C		F	C	C	D	D	D
Approach Delay (s)		51.1			38.5			48.8			48.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	119	1301	88	826
Future Volume (vph)	119	1301	88	826
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	22.5	22.5	22.5
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	11.2	43.3	43.3	43.3
Actuated g/C Ratio	0.17	0.67	0.67	0.67
v/c Ratio	0.60	0.61	0.51	0.35
Control Delay	25.5	3.6	20.2	4.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	3.6	20.2	4.0
LOS	C	A	C	A
Approach Delay	25.5	3.6		5.6
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 19 (29%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	206	1429	88	826
v/c Ratio	0.60	0.61	0.51	0.35
Control Delay	25.5	3.6	20.2	4.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	3.6	20.2	4.0
Queue Length 50th (m)	16.1	17.1	4.7	22.0
Queue Length 95th (m)	29.8	19.8	m12.1	m30.3
Internal Link Dist (m)	168.5	178.7		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	519	2359	173	2358
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.61	0.51	0.35

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	119	87	1301	128	88	826
Future Volume (vph)	119	87	1301	128	88	826
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1748		3530		1785	3544
Flt Permitted	0.97		1.00		0.14	1.00
Satd. Flow (perm)	1748		3530		261	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	119	87	1301	128	88	826
RTOR Reduction (vph)	41	0	9	0	0	0
Lane Group Flow (vph)	165	0	1420	0	88	826
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	11.2		43.3		43.3	43.3
Effective Green, g (s)	11.2		43.3		43.3	43.3
Actuated g/C Ratio	0.17		0.67		0.67	0.67
Clearance Time (s)	6.0		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	301		2351		173	2360
v/s Ratio Prot			c0.40			0.23
v/s Ratio Perm	c0.09				0.34	
v/c Ratio	0.55		0.60		0.51	0.35
Uniform Delay, d1	24.6		6.1		5.5	4.7
Progression Factor	1.00		0.41		1.46	0.71
Incremental Delay, d2	2.1		0.9		8.1	0.3
Delay (s)	26.6		3.4		16.1	3.7
Level of Service	C		A		B	A
Approach Delay (s)	26.6		3.4			4.9
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	133	13	111	5	17	1256	120	828
Future Volume (vph)	133	13	111	5	17	1256	120	828
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	24.0	24.0	25.0	25.0	25.0	25.0
Total Split (s)	24.0	24.0	24.0	24.0	41.0	41.0	41.0	41.0
Total Split (%)	36.9%	36.9%	36.9%	36.9%	63.1%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.7	12.7	12.7	12.7	39.3	39.3	39.3	39.3
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.60	0.60	0.60	0.60
v/c Ratio	0.58	0.19	0.44	0.52	0.05	0.65	0.76	0.39
Control Delay	32.9	9.3	27.3	22.3	3.2	4.4	44.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	9.3	27.3	22.3	3.2	4.4	44.6	2.7
LOS	C	A	C	C	A	A	D	A
Approach Delay		25.0		24.2		4.4		7.9
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 50 (77%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 85.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	67	111	180	17	1392	120	845
v/c Ratio	0.58	0.19	0.44	0.52	0.05	0.65	0.76	0.39
Control Delay	32.9	9.3	27.3	22.3	3.2	4.4	44.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	9.3	27.3	22.3	3.2	4.4	44.6	2.7
Queue Length 50th (m)	13.6	1.2	11.0	13.6	0.3	14.5	10.9	8.1
Queue Length 95th (m)	24.9	8.1	20.6	25.9	m0.7	19.0	#62.0	10.4
Internal Link Dist (m)		131.2		392.7		51.3		372.4
Turn Bay Length (m)			25.0		15.0		80.0	
Base Capacity (vph)	328	487	360	470	358	2137	157	2159
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	0.41	0.14	0.31	0.38	0.05	0.65	0.76	0.39

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	13	54	111	5	175	17	1256	136	120	828	17
Future Volume (vph)	133	13	54	111	5	175	17	1256	136	120	828	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		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	0.95	
Frt	1.00	0.88		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1619		1733	1589		1750	3519		1750	3568	
Flt Permitted	0.64	1.00		0.71	1.00		0.32	1.00		0.14	1.00	
Satd. Flow (perm)	1186	1619		1301	1589		593	3519		260	3568	
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)	133	13	54	111	5	175	17	1256	136	120	828	17
RTOR Reduction (vph)	0	43	0	0	35	0	0	10	0	0	2	0
Lane Group Flow (vph)	133	24	0	111	145	0	17	1382	0	120	843	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.7	12.7		12.7	12.7		39.3	39.3		39.3	39.3	
Effective Green, g (s)	12.7	12.7		12.7	12.7		39.3	39.3		39.3	39.3	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.60	0.60		0.60	0.60	
Clearance Time (s)	6.0	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	3.0	
Lane Grp Cap (vph)	231	316		254	310		358	2127		157	2157	
v/s Ratio Prot		0.01			0.09			0.39			0.24	
v/s Ratio Perm	c0.11			0.09			0.03			c0.46		
v/c Ratio	0.58	0.07		0.44	0.47		0.05	0.65		0.76	0.39	
Uniform Delay, d1	23.7	21.4		23.0	23.2		5.2	8.4		9.4	6.7	
Progression Factor	1.00	1.00		1.00	1.00		0.44	0.34		1.05	0.31	
Incremental Delay, d2	3.4	0.1		1.2	1.1		0.2	1.4		28.1	0.5	
Delay (s)	27.2	21.5		24.2	24.3		2.5	4.2		38.0	2.6	
Level of Service	C	C		C	C		A	A		D	A	
Approach Delay (s)		25.2			24.3			4.2			7.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	0	228	0	30	1011	30	954
Future Volume (vph)	93	0	228	0	30	1011	30	954
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	5.0	5.0	8.0	8.0	7.0	8.0
Minimum Split (s)	23.5	23.5	24.0	24.0	23.0	23.0	11.0	23.0
Total Split (s)	24.0	24.0	24.0	24.0	30.0	30.0	11.0	41.0
Total Split (%)	36.9%	36.9%	36.9%	36.9%	46.2%	46.2%	16.9%	63.1%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	6.0	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	15.2	15.2	15.7	15.7	31.9	31.9	39.3	36.3
Actuated g/C Ratio	0.23	0.23	0.24	0.24	0.49	0.49	0.60	0.56
v/c Ratio	0.32	0.20	0.78	0.20	0.11	0.66	0.09	0.48
Control Delay	22.7	2.9	41.7	0.8	8.6	18.3	4.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	2.9	41.7	0.8	8.6	18.3	4.0	5.7
LOS	C	A	D	A	A	B	A	A
Approach Delay		12.8		27.8		18.1		5.6
Approach LOS		B		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 56 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 61.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	93	228	117	30	1123	30	962
v/c Ratio	0.32	0.20	0.78	0.20	0.11	0.66	0.09	0.48
Control Delay	22.7	2.9	41.7	0.8	8.6	18.3	4.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	2.9	41.7	0.8	8.6	18.3	4.0	5.7
Queue Length 50th (m)	8.2	0.0	22.6	0.0	0.7	39.6	0.8	16.2
Queue Length 95th (m)	18.1	4.7	#48.1	0.0	m3.1	#146.7	2.2	28.1
Internal Link Dist (m)		114.7		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	338	519	338	630	269	1699	327	1999
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	0.28	0.18	0.67	0.19	0.11	0.66	0.09	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	93	228	0	117	30	1011	112	30	954	8
Future Volume (vph)	93	0	93	228	0	117	30	1011	112	30	954	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.0	6.0		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3437		1785	3574	
Flt Permitted	0.68	1.00		0.70	1.00		0.30	1.00		0.14	1.00	
Satd. Flow (perm)	1256	1566		1223	1566		548	3437		272	3574	
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)	93	0	93	228	0	117	30	1011	112	30	954	8
RTOR Reduction (vph)	0	71	0	0	89	0	0	11	0	0	1	0
Lane Group Flow (vph)	93	22	0	228	28	0	30	1112	0	30	961	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.2	15.2		15.7	15.7		29.5	29.5		36.3	36.3	
Effective Green, g (s)	15.2	15.2		15.7	15.7		29.5	29.5		36.3	36.3	
Actuated g/C Ratio	0.23	0.23		0.24	0.24		0.45	0.45		0.56	0.56	
Clearance Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		4.0	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)	293	366		295	378		248	1559		217	1995	
v/s Ratio Prot		0.01			0.02			c0.32		0.01	c0.27	
v/s Ratio Perm	0.07			c0.19			0.05			0.07		
v/c Ratio	0.32	0.06		0.77	0.07		0.12	0.71		0.14	0.48	
Uniform Delay, d1	20.6	19.3		23.0	19.0		10.3	14.3		8.1	8.7	
Progression Factor	1.00	1.00		1.00	1.00		0.62	1.16		0.58	0.53	
Incremental Delay, d2	0.6	0.1		11.9	0.1		0.7	2.1		0.3	0.8	
Delay (s)	21.2	19.4		34.9	19.1		7.1	18.7		5.0	5.4	
Level of Service	C	B		C	B		A	B		A	A	
Approach Delay (s)		20.3			29.5			18.4			5.4	
Approach LOS		C			C			B			A	

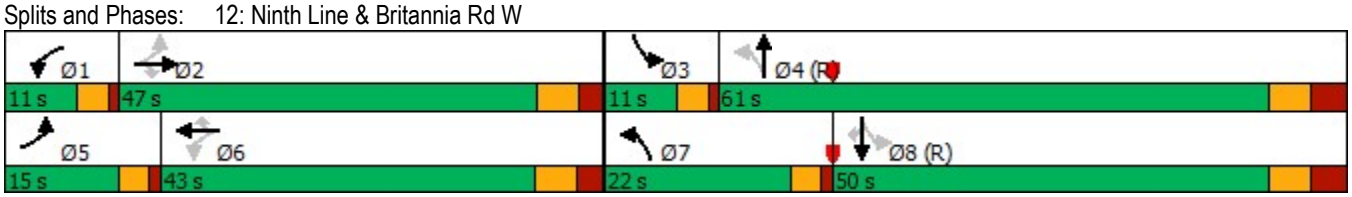
Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	151	1294	400	100	675	95	400	906	82	944	143
Future Volume (vph)	151	1294	400	100	675	95	400	906	82	944	143
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	3	8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	5	2	2	1	6	6	7	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0	12.0
Minimum Split (s)	11.0	26.5	26.5	11.0	26.7	26.7	11.0	47.7	11.0	47.7	47.7
Total Split (s)	15.0	47.0	47.0	11.0	43.0	43.0	22.0	61.0	11.0	50.0	50.0
Total Split (%)	11.5%	36.2%	36.2%	8.5%	33.1%	33.1%	16.9%	46.9%	8.5%	38.5%	38.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.7	2.7	1.0	3.7	1.0	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7	4.0	7.7	7.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	53.5	40.5	40.5	46.5	36.8	36.8	68.0	53.3	53.0	42.3	42.3
Actuated g/C Ratio	0.41	0.31	0.31	0.36	0.28	0.28	0.52	0.41	0.41	0.33	0.33
v/c Ratio	0.56	1.14	0.58	0.64	0.66	0.18	1.25	0.74	0.42	0.81	0.24
Control Delay	32.8	114.1	14.4	43.9	44.9	2.3	161.9	28.9	22.1	38.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	114.1	14.4	43.9	44.9	2.3	161.9	28.9	22.1	38.8	7.4
LOS	C	F	B	D	D	A	F	C	C	D	A
Approach Delay		85.8			40.1			65.3		33.8	
Approach LOS		F			D			E		C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 76 (58%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.25	
Intersection Signal Delay: 61.4	Intersection LOS: E
Intersection Capacity Utilization 108.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	151	1294	400	100	675	95	400	1060	82	944	143
v/c Ratio	0.56	1.14	0.58	0.64	0.66	0.18	1.25	0.74	0.42	0.81	0.24
Control Delay	32.8	114.1	14.4	43.9	44.9	2.3	161.9	28.9	22.1	38.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	114.1	14.4	43.9	44.9	2.3	161.9	28.9	22.1	38.8	7.4
Queue Length 50th (m)	22.5	~187.1	21.0	14.4	74.5	0.0	~100.3	79.2	8.8	87.4	4.5
Queue Length 95th (m)	36.2	#226.1	51.2	#28.7	93.7	3.6	m#121.1	m79.7	m16.8	118.7	m11.8
Internal Link Dist (m)		80.1			420.4			341.1		608.8	
Turn Bay Length (m)	80.0		80.0	70.0		70.0	75.0		60.0		60.0
Base Capacity (vph)	277	1137	687	157	1024	531	321	1433	194	1164	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	1.14	0.58	0.64	0.66	0.18	1.25	0.74	0.42	0.81	0.24

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	1294	400	100	675	95	400	906	154	82	944	143
Future Volume (vph)	151	1294	400	100	675	95	400	906	154	82	944	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7		4.0	7.7	7.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1785	3650	1581	1767	3614	1521	1767	3471		1668	3579	1581
Flt Permitted	0.20	1.00	1.00	0.11	1.00	1.00	0.11	1.00		0.17	1.00	1.00
Satd. Flow (perm)	381	3650	1581	202	3614	1521	202	3471		298	3579	1581
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)	151	1294	400	100	675	95	400	906	154	82	944	143
RTOR Reduction (vph)	0	0	195	0	0	68	0	11	0	0	0	89
Lane Group Flow (vph)	151	1294	205	100	675	27	400	1049	0	82	944	54
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	51.0	40.5	40.5	43.8	36.8	36.8	64.3	53.3		49.3	42.3	42.3
Effective Green, g (s)	51.0	40.5	40.5	43.8	36.8	36.8	64.3	53.3		49.3	42.3	42.3
Actuated g/C Ratio	0.39	0.31	0.31	0.34	0.28	0.28	0.49	0.41		0.38	0.33	0.33
Clearance Time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7		4.0	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	262	1137	492	152	1023	430	316	1423		186	1164	514
v/s Ratio Prot	c0.05	c0.35		0.04	0.19		c0.17	0.30		0.02	0.26	
v/s Ratio Perm	0.18		0.13	0.19		0.02	c0.45			0.14		0.03
v/c Ratio	0.58	1.14	0.42	0.66	0.66	0.06	1.27	0.74		0.44	0.81	0.10
Uniform Delay, d1	28.1	44.8	35.4	34.7	41.1	34.0	37.1	32.4		27.5	40.2	30.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.33	0.84		0.95	0.82	1.04
Incremental Delay, d2	3.1	73.2	2.6	9.8	3.3	0.3	133.1	1.9		1.5	5.5	0.4
Delay (s)	31.2	118.0	38.0	44.5	44.4	34.3	182.6	29.0		27.5	38.5	32.1
Level of Service	C	F	D	D	D	C	F	C		C	D	C
Approach Delay (s)		93.5			43.3			71.1			36.9	
Approach LOS		F			D			E			D	

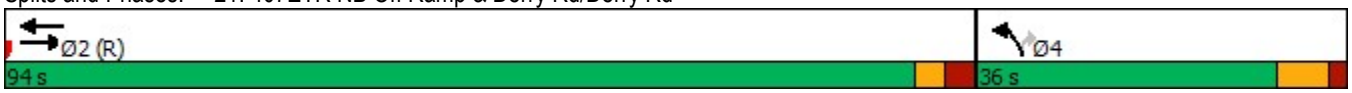
Intersection Summary			
HCM 2000 Control Delay	66.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1567	1102	19	185
Future Volume (vph)	1567	1102	19	185
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	94.0	94.0	36.0	36.0
Total Split (%)	72.3%	72.3%	27.7%	27.7%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	88.0	88.0	29.0	29.0
Actuated g/C Ratio	0.68	0.68	0.22	0.22
v/c Ratio	0.65	0.46	0.03	0.49
Control Delay	13.6	10.7	39.7	37.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.6	10.7	39.7	37.2
LOS	B	B	D	D
Approach Delay	13.6	10.7	37.4	
Approach LOS	B	B	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1567	1102	19	185
v/c Ratio	0.65	0.46	0.03	0.49
Control Delay	13.6	10.7	39.7	37.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.6	10.7	39.7	37.2
Queue Length 50th (m)	102.8	59.2	1.8	28.0
Queue Length 95th (m)	122.0	71.5	4.9	49.9
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2422	2376	654	374
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.46	0.03	0.49

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1567	0	0	1102	19	185
Future Volume (vph)	1567	0	0	1102	19	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1567	0	0	1102	19	185
RTOR Reduction (vph)	0	0	0	0	0	38
Lane Group Flow (vph)	1567	0	0	1102	19	147
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	88.0			88.0	29.0	29.0
Effective Green, g (s)	88.0			88.0	29.0	29.0
Actuated g/C Ratio	0.68			0.68	0.22	0.22
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2422			2376	654	336
v/s Ratio Prot	c0.44			0.31	0.01	
v/s Ratio Perm						c0.10
v/c Ratio	0.65			0.46	0.03	0.44
Uniform Delay, d1	12.1			9.9	39.5	43.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.4			0.7	0.1	4.1
Delay (s)	13.4			10.5	39.6	47.6
Level of Service	B			B	D	D
Approach Delay (s)	13.4			10.5	46.8	
Approach LOS	B			B	D	

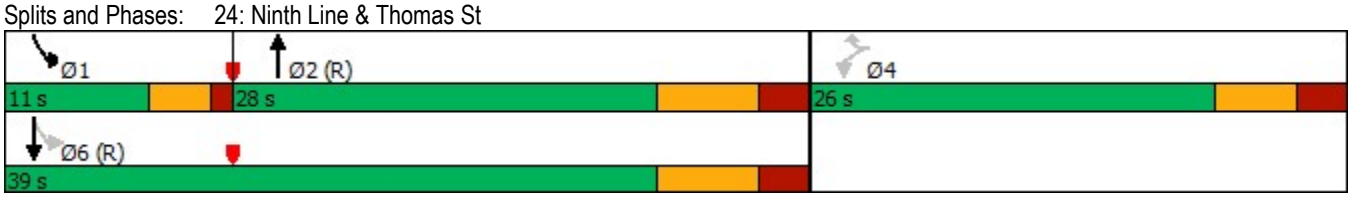
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	208	183	1267	142	1396
Future Volume (vph)	208	183	1267	142	1396
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	26.0	26.0	28.0	11.0	39.0
Total Split (%)	40.0%	40.0%	43.1%	16.9%	60.0%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.5	4.0	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	12.9	12.9	28.4	41.6	38.1
Actuated g/C Ratio	0.20	0.20	0.44	0.64	0.59
v/c Ratio	0.60	0.41	0.95	0.46	0.67
Control Delay	30.3	6.7	32.5	12.3	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	6.7	32.5	12.3	10.5
LOS	C	A	C	B	B
Approach Delay	19.3		32.5		10.6
Approach LOS	B		C		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 26 (40%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 75.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	208	183	1457	142	1396
v/c Ratio	0.60	0.41	0.95	0.46	0.67
Control Delay	30.3	6.7	32.5	12.3	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	6.7	32.5	12.3	10.5
Queue Length 50th (m)	21.1	0.0	~122.7	6.2	30.1
Queue Length 95th (m)	34.7	11.5	#207.1	m14.8	145.7
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	524	576	1534	312	2095
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.32	0.95	0.46	0.67

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.

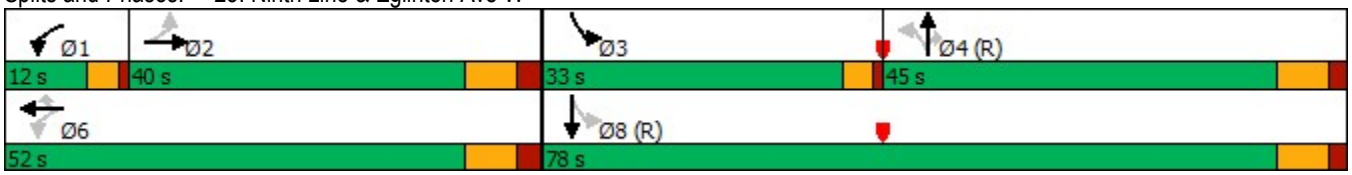
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	208	183	1267	190	142	1396
Future Volume (vph)	208	183	1267	190	142	1396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.5		4.0	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1748	1493	3474		1653	3579
Flt Permitted	0.95	1.00	1.00		0.13	1.00
Satd. Flow (perm)	1748	1493	3474		220	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	208	183	1267	190	142	1396
RTOR Reduction (vph)	0	147	15	0	0	0
Lane Group Flow (vph)	208	36	1442	0	142	1396
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	12.9	12.9	27.7		38.1	38.1
Effective Green, g (s)	12.9	12.9	27.7		38.1	38.1
Actuated g/C Ratio	0.20	0.20	0.43		0.59	0.59
Clearance Time (s)	6.5	6.5	7.5		4.0	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	346	296	1480		270	2097
v/s Ratio Prot			c0.41		0.05	c0.39
v/s Ratio Perm	c0.12	0.02			0.26	
v/c Ratio	0.60	0.12	0.97		0.53	0.67
Uniform Delay, d1	23.7	21.4	18.3		11.4	9.1
Progression Factor	1.00	1.00	0.84		1.62	0.93
Incremental Delay, d2	2.9	0.2	16.8		1.4	1.2
Delay (s)	26.6	21.6	32.1		19.8	9.7
Level of Service	C	C	C		B	A
Approach Delay (s)	24.3		32.1			10.7
Approach LOS	C		C			B

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	37	612	99	264	256	23	757	137	400	1280
Future Volume (vph)	37	612	99	264	256	23	757	137	400	1280
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases		2	1	6			4		3	8
Permitted Phases	2		6		6	4		4	8	
Detector Phase	2	2	1	6	6	4	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.0	32.5	32.5	40.0	40.0	40.0	11.0	40.0
Total Split (s)	40.0	40.0	12.0	52.0	52.0	45.0	45.0	45.0	33.0	78.0
Total Split (%)	30.8%	30.8%	9.2%	40.0%	40.0%	34.6%	34.6%	34.6%	25.4%	60.0%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	7.0	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	32.7	32.7	48.0	44.5	44.5	42.0	42.0	42.0	74.0	71.0
Actuated g/C Ratio	0.25	0.25	0.37	0.34	0.34	0.32	0.32	0.32	0.57	0.55
v/c Ratio	0.14	0.82	0.54	0.41	0.38	0.33	0.67	0.24	0.87	0.69
Control Delay	39.8	53.7	38.9	35.2	5.2	52.2	42.6	11.4	38.4	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	53.7	38.9	35.2	5.2	52.2	42.6	11.4	38.4	28.4
LOS	D	D	D	D	A	D	D	B	D	C
Approach Delay		53.0		23.4			38.2			30.7
Approach LOS		D		C			D			C

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 100 (77%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 35.5	Intersection LOS: D
Intersection Capacity Utilization 95.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	37	730	99	264	256	23	757	137	400	1347
v/c Ratio	0.14	0.82	0.54	0.41	0.38	0.33	0.67	0.24	0.87	0.69
Control Delay	39.8	53.7	38.9	35.2	5.2	52.2	42.6	11.4	38.4	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	53.7	38.9	35.2	5.2	52.2	42.6	11.4	38.4	28.4
Queue Length 50th (m)	6.8	84.4	15.5	47.5	0.0	4.2	83.7	5.4	53.8	149.0
Queue Length 95th (m)	15.6	106.0	27.3	70.2	16.6	13.6	106.2	19.7	m#83.7	176.1
Internal Link Dist (m)		373.3		388.7			291.0			248.0
Turn Bay Length (m)	20.0		35.0			65.0		30.0	65.0	
Base Capacity (vph)	263	889	185	638	674	69	1122	579	501	1945
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.82	0.54	0.41	0.38	0.33	0.67	0.24	0.80	0.69

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	612	118	99	264	256	23	757	137	400	1280	67
Future Volume (vph)	37	612	118	99	264	256	23	757	137	400	1280	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0	7.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1668	3490		1733	1865	1479	1069	3476	1574	1716	3555	
Flt Permitted	0.60	1.00		0.14	1.00	1.00	0.19	1.00	1.00	0.19	1.00	
Satd. Flow (perm)	1047	3490		257	1865	1479	215	3476	1574	343	3555	
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)	37	612	118	99	264	256	23	757	137	400	1280	67
RTOR Reduction (vph)	0	12	0	0	0	168	0	0	71	0	3	0
Lane Group Flow (vph)	37	718	0	99	264	88	23	757	66	400	1344	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4		4	8		
Actuated Green, G (s)	32.7	32.7		44.5	44.5	44.5	42.0	42.0	42.0	71.0	71.0	
Effective Green, g (s)	32.7	32.7		44.5	44.5	44.5	42.0	42.0	42.0	71.0	71.0	
Actuated g/C Ratio	0.25	0.25		0.34	0.34	0.34	0.32	0.32	0.32	0.55	0.55	
Clearance Time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	263	877		176	638	506	69	1123	508	451	1941	
v/s Ratio Prot		c0.21		c0.03	0.14			0.22		c0.17	0.38	
v/s Ratio Perm	0.04			0.16		0.06	0.11		0.04	c0.31		
v/c Ratio	0.14	0.82		0.56	0.41	0.17	0.33	0.67	0.13	0.89	0.69	
Uniform Delay, d1	37.7	45.9		32.2	32.8	29.9	33.4	38.1	31.1	25.9	21.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.09	1.24	
Incremental Delay, d2	1.1	8.4		4.1	2.0	0.7	12.5	3.2	0.5	13.1	1.3	
Delay (s)	38.9	54.3		36.3	34.7	30.6	45.9	41.3	31.6	41.3	28.2	
Level of Service	D	D		D	C	C	D	D	C	D	C	
Approach Delay (s)		53.5			33.3			40.0			31.2	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	48	1267	48	1572
Future Volume (vph)	48	1267	48	1572
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	24.5	24.0	24.0
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.2	47.3	47.3	47.3
Actuated g/C Ratio	0.14	0.73	0.73	0.73
v/c Ratio	0.50	0.53	0.22	0.60
Control Delay	23.4	1.6	3.3	2.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.4	1.6	3.3	2.3
LOS	C	A	A	A
Approach Delay	23.4	1.6		2.4
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 52 (80%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 3.0	Intersection LOS: A
Intersection Capacity Utilization 61.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	1342	48	1572
v/c Ratio	0.50	0.53	0.22	0.60
Control Delay	23.4	1.6	3.3	2.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.4	1.6	3.3	2.3
Queue Length 50th (m)	9.8	5.1	0.7	13.5
Queue Length 95th (m)	21.4	6.8	m1.2	14.8
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	506	2554	222	2605
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.53	0.22	0.60

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	93	1267	75	48	1572
Future Volume (vph)	48	93	1267	75	48	1572
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1709		3503		1684	3579
Flt Permitted	0.98		1.00		0.17	1.00
Satd. Flow (perm)	1709		3503		305	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	93	1267	75	48	1572
RTOR Reduction (vph)	40	0	4	0	0	0
Lane Group Flow (vph)	101	0	1338	0	48	1572
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	8.1		44.9		44.9	44.9
Effective Green, g (s)	8.1		44.9		44.9	44.9
Actuated g/C Ratio	0.12		0.69		0.69	0.69
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	212		2419		210	2472
v/s Ratio Prot			0.38			c0.44
v/s Ratio Perm	c0.06				0.16	
v/c Ratio	0.48		0.55		0.23	0.64
Uniform Delay, d1	26.5		5.0		3.7	5.5
Progression Factor	1.00		0.16		0.29	0.25
Incremental Delay, d2	1.7		0.8		2.0	1.0
Delay (s)	28.2		1.7		3.0	2.4
Level of Service	C		A		A	A
Approach Delay (s)	28.2		1.7			2.4
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	142	75	1039	108	1646
Future Volume (vph)	142	75	1039	108	1646
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	23.0	23.0	31.0	11.0	42.0
Total Split (%)	35.4%	35.4%	47.7%	16.9%	64.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.8	10.8	36.6	46.6	45.8
Actuated g/C Ratio	0.17	0.17	0.56	0.72	0.70
v/c Ratio	0.48	0.23	0.58	0.28	0.65
Control Delay	29.7	8.1	18.6	7.5	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	8.1	18.6	7.5	11.0
LOS	C	A	B	A	B
Approach Delay	22.2		18.6		10.8
Approach LOS	C		B		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 12 (18%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	142	75	1116	108	1646
v/c Ratio	0.48	0.23	0.58	0.28	0.65
Control Delay	29.7	8.1	18.6	7.5	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	8.1	18.6	7.5	11.0
Queue Length 50th (m)	14.6	0.0	63.6	7.5	87.8
Queue Length 95th (m)	26.3	8.1	124.2	13.2	81.3
Internal Link Dist (m)	358.4		271.6		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	448	461	1924	389	2521
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.16	0.58	0.28	0.65

Intersection Summary

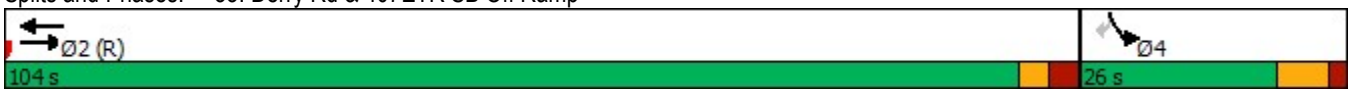
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	142	75	1039	77	108	1646
Future Volume (vph)	142	75	1039	77	108	1646
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3409		1785	3579
Flt Permitted	0.95	1.00	1.00		0.16	1.00
Satd. Flow (perm)	1765	1597	3409		308	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	75	1039	77	108	1646
RTOR Reduction (vph)	0	64	7	0	0	0
Lane Group Flow (vph)	142	11	1109	0	108	1646
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	9.2	9.2	33.3		43.3	43.3
Effective Green, g (s)	9.2	9.2	33.3		43.3	43.3
Actuated g/C Ratio	0.14	0.14	0.51		0.67	0.67
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	249	226	1746		341	2384
v/s Ratio Prot			0.33		0.03	c0.46
v/s Ratio Perm	c0.08	0.01			0.18	
v/c Ratio	0.57	0.05	0.64		0.32	0.69
Uniform Delay, d1	26.1	24.1	11.5		5.6	6.7
Progression Factor	1.00	1.00	1.37		1.50	1.33
Incremental Delay, d2	3.1	0.1	1.7		0.5	1.4
Delay (s)	29.2	24.2	17.3		8.9	10.3
Level of Service	C	C	B		A	B
Approach Delay (s)	27.5		17.3			10.2
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1923	904	54	46
Future Volume (vph)	1923	904	54	46
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	104.0	104.0	26.0	26.0
Total Split (%)	80.0%	80.0%	20.0%	20.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	113.0	113.0	8.0	8.0
Actuated g/C Ratio	0.87	0.87	0.06	0.06
v/c Ratio	0.61	0.30	0.28	0.37
Control Delay	4.3	2.3	61.5	24.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.3	2.3	61.5	24.6
LOS	A	A	E	C
Approach Delay	4.3	2.3	44.5	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 5.0	Intersection LOS: A
Intersection Capacity Utilization 69.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1923	904	54	46
v/c Ratio	0.61	0.30	0.28	0.37
Control Delay	4.3	2.3	61.5	24.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.3	2.3	61.5	24.6
Queue Length 50th (m)	61.6	18.2	6.3	0.0
Queue Length 95th (m)	85.2	26.2	12.5	11.3
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	3141	3050	460	230
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.30	0.12	0.20

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1923	904	0	54	46
Future Volume (vph)	0	1923	904	0	54	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1923	904	0	54	46
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	0	1923	904	0	54	2
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		110.4	110.4		6.6	6.6
Effective Green, g (s)		110.4	110.4		6.6	6.6
Actuated g/C Ratio		0.85	0.85		0.05	0.05
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3069	2980		159	66
v/s Ratio Prot		c0.53	0.26		c0.02	
v/s Ratio Perm						0.00
v/c Ratio		0.63	0.30		0.34	0.04
Uniform Delay, d1		3.2	2.0		59.6	58.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.0	0.3		1.3	0.2
Delay (s)		4.1	2.3		60.9	58.9
Level of Service		A	A		E	E
Approach Delay (s)		4.1	2.3		60.0	
Approach LOS		A	A		E	

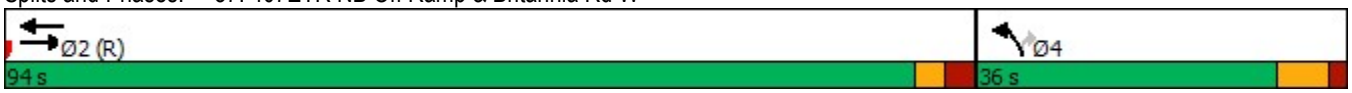
Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1648	1032	69	191
Future Volume (vph)	1648	1032	69	191
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	94.0	94.0	36.0	36.0
Total Split (%)	72.3%	72.3%	27.7%	27.7%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	98.9	98.9	18.1	18.1
Actuated g/C Ratio	0.76	0.76	0.14	0.14
v/c Ratio	0.60	0.38	0.31	0.76
Control Delay	8.6	6.2	52.0	60.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.6	6.2	52.0	60.1
LOS	A	A	D	E
Approach Delay	8.6	6.2	57.9	
Approach LOS	A	A	E	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 57.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1648	1032	69	191
v/c Ratio	0.60	0.38	0.31	0.76
Control Delay	8.6	6.2	52.0	60.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.6	6.2	52.0	60.1
Queue Length 50th (m)	77.8	37.3	14.8	34.7
Queue Length 95th (m)	120.3	59.0	26.4	55.0
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2750	2723	358	381
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.38	0.19	0.50

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1648	0	0	1032	69	191
Future Volume (vph)	1648	0	0	1032	69	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1648	0	0	1032	69	191
RTOR Reduction (vph)	0	0	0	0	0	35
Lane Group Flow (vph)	1648	0	0	1032	69	156
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	98.9			98.9	18.1	18.1
Effective Green, g (s)	98.9			98.9	18.1	18.1
Actuated g/C Ratio	0.76			0.76	0.14	0.14
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2749			2722	223	218
v/s Ratio Prot	c0.46			0.29	0.04	
v/s Ratio Perm						c0.10
v/c Ratio	0.60			0.38	0.31	0.71
Uniform Delay, d1	6.8			5.2	50.3	53.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.0			0.4	0.8	10.6
Delay (s)	7.8			5.6	51.1	64.0
Level of Service	A			A	D	E
Approach Delay (s)	7.8			5.6	60.6	
Approach LOS	A			A	E	

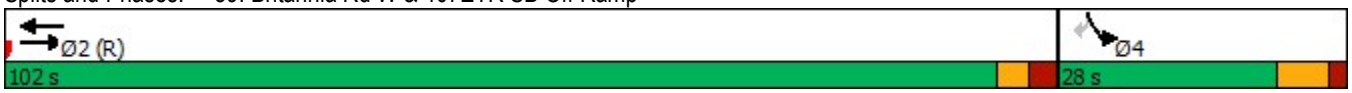
Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1763	965	70	63
Future Volume (vph)	1763	965	70	63
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	102.0	102.0	28.0	28.0
Total Split (%)	78.5%	78.5%	21.5%	21.5%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	106.2	106.2	10.8	10.8
Actuated g/C Ratio	0.82	0.82	0.08	0.08
v/c Ratio	0.60	0.33	0.50	0.40
Control Delay	5.5	3.5	68.5	20.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	3.5	68.5	20.3
LOS	A	A	E	C
Approach Delay	5.5	3.5	45.6	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1763	965	70	63
v/c Ratio	0.60	0.33	0.50	0.40
Control Delay	5.5	3.5	68.5	20.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	3.5	68.5	20.3
Queue Length 50th (m)	62.5	23.9	16.1	0.0
Queue Length 95th (m)	91.7	36.3	29.4	12.5
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2951	2922	272	248
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.33	0.26	0.25

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1763	965	0	70	63
Future Volume (vph)	0	1763	965	0	70	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1763	965	0	70	63
RTOR Reduction (vph)	0	0	0	0	0	58
Lane Group Flow (vph)	0	1763	965	0	70	5
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		106.2	106.2		10.8	10.8
Effective Green, g (s)		106.2	106.2		10.8	10.8
Actuated g/C Ratio		0.82	0.82		0.08	0.08
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2952	2923		139	100
v/s Ratio Prot		c0.49	0.27		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.60	0.33		0.50	0.05
Uniform Delay, d1		4.3	3.0		57.0	54.9
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.9	0.3		2.9	0.2
Delay (s)		5.2	3.3		59.9	55.1
Level of Service		A	A		E	E
Approach Delay (s)		5.2	3.3		57.6	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	116	5	5	5	100	957	2	1617
Future Volume (vph)	116	5	5	5	100	957	2	1617
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	29.0	29.0	24.0	24.0	24.0	24.0
Total Split (s)	29.0	29.0	29.0	29.0	36.0	36.0	36.0	36.0
Total Split (%)	44.6%	44.6%	44.6%	44.6%	55.4%	55.4%	55.4%	55.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	16.8	16.8	16.8	16.8	39.2	39.2	39.2	39.2
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.60	0.60	0.60	0.60
v/c Ratio	0.33	0.70	0.03	0.04	0.88	0.45	0.01	0.79
Control Delay	20.4	29.6	15.2	9.8	84.2	10.8	13.0	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	29.6	15.2	9.8	84.2	10.8	13.0	19.6
LOS	C	C	B	A	F	B	B	B
Approach Delay		27.0		11.0		17.7		19.5
Approach LOS		C		B		B		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 64: Ninth Line & Skyview Access/Skyview Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	290	5	17	100	959	2	1659
v/c Ratio	0.33	0.70	0.03	0.04	0.88	0.45	0.01	0.79
Control Delay	20.4	29.6	15.2	9.8	84.2	10.8	13.0	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	29.6	15.2	9.8	84.2	10.8	13.0	19.6
Queue Length 50th (m)	10.4	27.9	0.4	0.4	16.4	94.6	0.2	110.2
Queue Length 95th (m)	18.5	42.5	2.1	3.5	m#53.3	116.8	m0.3	#121.0
Internal Link Dist (m)		132.8		149.0		248.0		170.5
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	517	599	289	628	113	2111	284	2104
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	0.22	0.48	0.02	0.03	0.88	0.45	0.01	0.79

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	5	285	5	5	12	100	957	2	2	1617	42
Future Volume (vph)	116	5	285	5	5	12	100	957	2	2	1617	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1571		1750	1647		1750	3499		1750	3487	
Flt Permitted	0.75	1.00		0.42	1.00		0.10	1.00		0.26	1.00	
Satd. Flow (perm)	1375	1571		769	1647		188	3499		472	3487	
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)	116	5	285	5	5	12	100	957	2	2	1617	42
RTOR Reduction (vph)	0	8	0	0	9	0	0	0	0	0	2	0
Lane Group Flow (vph)	116	282	0	5	8	0	100	959	0	2	1657	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.8	16.8		16.8	16.8		39.2	39.2		39.2	39.2	
Effective Green, g (s)	16.8	16.8		16.8	16.8		39.2	39.2		39.2	39.2	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.60	0.60		0.60	0.60	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	355	406		198	425		113	2110		284	2102	
v/s Ratio Prot		c0.18			0.00			0.27			0.48	
v/s Ratio Perm	0.08			0.01			c0.53			0.00		
v/c Ratio	0.33	0.69		0.03	0.02		0.88	0.45		0.01	0.79	
Uniform Delay, d1	19.5	21.8		18.0	18.0		11.0	7.1		5.1	9.8	
Progression Factor	1.00	1.00		1.00	1.00		2.35	1.30		1.75	1.55	
Incremental Delay, d2	0.5	5.1		0.1	0.0		50.8	0.6		0.0	2.5	
Delay (s)	20.1	26.9		18.0	18.0		76.6	9.8		9.0	17.6	
Level of Service	C	C		B	B		E	A		A	B	
Approach Delay (s)		24.9			18.0			16.1			17.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	0	42	46	0	68	10	1147	36	30	1012	39
Future Volume (Veh/h)	29	0	42	46	0	68	10	1147	36	30	1012	39
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)	29	0	42	46	0	68	10	1147	36	30	1012	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.77	0.77		0.77	0.77	0.77				0.77		
vC, conflicting volume	1753	2294	526	1793	2296	592	1051			1183		
vC1, stage 1 conf vol	1092	1092		1185	1185							
vC2, stage 2 conf vol	662	1203		608	1111							
vCu, unblocked vol	1384	2086	526	1436	2088	0	1051			646		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	92	82	100	92	98			96		
cM capacity (veh/h)	208	204	497	251	205	842	658			717		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	42	114	10	765	418	30	675	376
Volume Left	29	0	46	10	0	0	30	0	0
Volume Right	0	42	68	0	0	36	0	0	39
cSH	208	497	432	658	1700	1700	717	1700	1700
Volume to Capacity	0.14	0.08	0.26	0.02	0.45	0.25	0.04	0.40	0.22
Queue Length 95th (m)	3.3	1.9	7.3	0.3	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	25.1	12.9	16.3	10.6	0.0	0.0	10.2	0.0	0.0
Lane LOS	D	B	C	B			B		
Approach Delay (s)	17.9		16.3	0.1			0.3		
Approach LOS	C		C						

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	46	1368	69	34	1494
Future Volume (Veh/h)	52	46	1368	69	34	1494
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)	52	46	1368	69	34	1494
Pedestrians			1			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						365
pX, platoon unblocked	0.76					
vC, conflicting volume	2184	684			1437	
vC1, stage 1 conf vol	1368					
vC2, stage 2 conf vol	816					
vCu, unblocked vol	1923	684			1437	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	88			93	
cM capacity (veh/h)	191	389			479	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	98	684	684	69	34	747	747
Volume Left	52	0	0	0	34	0	0
Volume Right	46	0	0	69	0	0	0
cSH	251	1700	1700	1700	479	1700	1700
Volume to Capacity	0.39	0.40	0.40	0.04	0.07	0.44	0.44
Queue Length 95th (m)	12.3	0.0	0.0	0.0	1.6	0.0	0.0
Control Delay (s)	28.2	0.0	0.0	0.0	13.1	0.0	0.0
Lane LOS	D				B		
Approach Delay (s)	28.2	0.0			0.3		
Approach LOS	D						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	38	11	1083	1784	6
Future Volume (Veh/h)	21	38	11	1083	1784	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)	21	38	11	1083	1784	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				194	296	
pX, platoon unblocked	0.72	0.65	0.65			
vC, conflicting volume	2350	895	1790			
vC1, stage 1 conf vol	1787					
vC2, stage 2 conf vol	564					
vCu, unblocked vol	1199	0	1141			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	95	97			
cM capacity (veh/h)	170	706	396			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	21	38	11	542	542	1189	601
Volume Left	21	0	11	0	0	0	0
Volume Right	0	38	0	0	0	0	6
cSH	170	706	396	1700	1700	1700	1700
Volume to Capacity	0.12	0.05	0.03	0.32	0.32	0.70	0.35
Queue Length 95th (m)	2.9	1.2	0.6	0.0	0.0	0.0	0.0
Control Delay (s)	29.1	10.4	14.4	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	17.1		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	8	2	1430	946	18
Future Volume (Veh/h)	20	8	2	1430	946	18
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)	20	8	2	1430	946	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				397	203	
pX, platoon unblocked	0.85	0.91	0.91			
vC, conflicting volume	1674	482	964			
vC1, stage 1 conf vol	955					
vC2, stage 2 conf vol	719					
vCu, unblocked vol	961	237	766			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	363	696	768			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	20	8	2	715	715	631	333
Volume Left	20	0	2	0	0	0	0
Volume Right	0	8	0	0	0	0	18
cSH	363	696	768	1700	1700	1700	1700
Volume to Capacity	0.06	0.01	0.00	0.42	0.42	0.37	0.20
Queue Length 95th (m)	1.2	0.2	0.1	0.0	0.0	0.0	0.0
Control Delay (s)	15.5	10.2	9.7	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	14.0		0.0			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	15	9	1303	981	16
Future Volume (Veh/h)	42	15	9	1303	981	16
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)	42	15	9	1303	981	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					384	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1658	498	997			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1553	303	840			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	56	98	99			
cM capacity (veh/h)	95	643	733			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	15	9	652	652	654	343
Volume Left	42	0	9	0	0	0	0
Volume Right	0	15	0	0	0	0	16
cSH	95	643	733	1700	1700	1700	1700
Volume to Capacity	0.44	0.02	0.01	0.38	0.38	0.38	0.20
Queue Length 95th (m)	13.0	0.5	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	69.8	10.7	10.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	A				
Approach Delay (s)	54.2		0.1			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	199	813	400	230	1737	260	658	200	56	560	315
Future Volume (vph)	199	813	400	230	1737	260	658	200	56	560	315
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6	7	4			8	
Permitted Phases	2		2	6		4		4	8		8
Detector Phase	5	2	2	1	6	7	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	7.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	11.0	30.1	30.1	11.0	30.1	11.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	14.0	56.0	56.0	22.0	64.0	15.0	52.0	52.0	37.0	37.0	37.0
Total Split (%)	10.8%	43.1%	43.1%	16.9%	49.2%	11.5%	40.0%	40.0%	28.5%	28.5%	28.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.1	2.1	1.0	2.1	1.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	6.1	4.0	6.1	4.0	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	66.1	54.0	54.0	72.7	57.9	48.0	45.6	45.6	30.6	30.6	30.6
Actuated g/C Ratio	0.51	0.42	0.42	0.56	0.45	0.37	0.35	0.35	0.24	0.24	0.24
v/c Ratio	1.02	0.55	0.49	0.62	1.11	0.97	0.99	0.31	0.98	0.66	0.63
Control Delay	103.3	31.1	10.4	21.7	93.9	81.5	68.9	11.5	165.4	49.3	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.3	31.1	10.4	21.7	93.9	81.5	68.9	11.5	165.4	49.3	26.8
LOS	F	C	B	C	F	F	E	B	F	D	C
Approach Delay		35.4			85.6		61.6			48.7	
Approach LOS		D			F		E			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 61.5	Intersection LOS: E
Intersection Capacity Utilization 120.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	199	813	400	230	1782	260	658	200	56	560	315
v/c Ratio	1.02	0.55	0.49	0.62	1.11	0.97	0.99	0.31	0.98	0.66	0.63
Control Delay	103.3	31.1	10.4	21.7	93.9	81.5	68.9	11.5	165.4	49.3	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.3	31.1	10.4	21.7	93.9	81.5	68.9	11.5	165.4	49.3	26.8
Queue Length 50th (m)	~34.6	75.4	17.4	25.7	~253.2	47.3	117.3	10.9	13.2	63.3	31.4
Queue Length 95th (m)	#81.6	99.0	45.3	38.8	#292.5	#92.6	#219.8	32.2	#39.2	81.4	60.9
Internal Link Dist (m)		119.7			244.5		681.0			237.0	
Turn Bay Length (m)	75.0		40.0	80.0		130.0			95.0		65.0
Base Capacity (vph)	195	1473	818	418	1604	268	667	640	57	850	499
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.55	0.49	0.55	1.11	0.97	0.99	0.31	0.98	0.66	0.63

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	813	400	230	1737	45	260	658	200	56	560	315
Future Volume (vph)	199	813	400	230	1737	45	260	658	200	56	560	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1	6.1	4.0	6.1		4.0	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1767	3544	1573	1767	3599		1767	1902	1560	1785	3614	1581
Flt Permitted	0.07	1.00	1.00	0.22	1.00		0.22	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	138	3544	1573	403	3599		417	1902	1560	246	3614	1581
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)	199	813	400	230	1737	45	260	658	200	56	560	315
RTOR Reduction (vph)	0	0	165	0	2	0	0	0	93	0	0	127
Lane Group Flow (vph)	199	813	235	230	1780	0	260	658	107	56	560	188
Confl. Peds. (#/hr)			2	2					1	1		
Heavy Vehicles (%)	1%	3%	0%	1%	1%	2%	1%	1%	1%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2		2	6			4		4	8		8
Actuated Green, G (s)	64.0	54.0	54.0	71.8	57.9		45.6	45.6	45.6	30.6	30.6	30.6
Effective Green, g (s)	64.0	54.0	54.0	71.8	57.9		45.6	45.6	45.6	30.6	30.6	30.6
Actuated g/C Ratio	0.49	0.42	0.42	0.55	0.45		0.35	0.35	0.35	0.24	0.24	0.24
Clearance Time (s)	4.0	6.1	6.1	4.0	6.1		4.0	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	193	1472	653	368	1602		260	667	547	57	850	372
v/s Ratio Prot	c0.08	0.23		c0.07	c0.49		0.08	c0.35			0.15	
v/s Ratio Perm	0.43		0.15	0.28			c0.27		0.07	0.23		0.12
v/c Ratio	1.03	0.55	0.36	0.62	1.11		1.00	0.99	0.20	0.98	0.66	0.51
Uniform Delay, d1	38.3	28.8	26.1	17.7	36.0		38.2	41.9	29.4	49.4	45.0	43.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.05	0.91	1.08	1.00	1.00	1.00
Incremental Delay, d2	73.1	1.5	1.5	3.3	59.5		53.3	30.1	0.7	114.3	4.0	4.8
Delay (s)	111.5	30.3	27.7	21.0	95.6		93.5	68.4	32.4	163.7	49.0	48.0
Level of Service	F	C	C	C	F		F	E	C	F	D	D
Approach Delay (s)		41.0			87.1			67.8			55.5	
Approach LOS		D			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	65.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	120.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	111	1028	51	1214
Future Volume (vph)	111	1028	51	1214
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	22.5	22.5	22.5
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	10.2	44.3	44.3	44.3
Actuated g/C Ratio	0.16	0.68	0.68	0.68
v/c Ratio	0.55	0.47	0.18	0.50
Control Delay	25.6	2.2	4.8	5.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	2.2	4.8	5.1
LOS	C	A	A	A
Approach Delay	25.6	2.2		5.1
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 43 (66%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 5.1	Intersection LOS: A
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	165	1115	51	1214
v/c Ratio	0.55	0.47	0.18	0.50
Control Delay	25.6	2.2	4.8	5.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	2.2	4.8	5.1
Queue Length 50th (m)	13.1	8.4	1.7	35.2
Queue Length 95th (m)	25.7	12.8	m3.6	40.4
Internal Link Dist (m)	168.5	192.2		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	507	2377	287	2417
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.47	0.18	0.50

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	111	54	1028	87	51	1214
Future Volume (vph)	111	54	1028	87	51	1214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.96		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1736		3476		1785	3544
Flt Permitted	0.97		1.00		0.22	1.00
Satd. Flow (perm)	1736		3476		420	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	54	1028	87	51	1214
RTOR Reduction (vph)	31	0	7	0	0	0
Lane Group Flow (vph)	134	0	1108	0	51	1214
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	10.2		44.3		44.3	44.3
Effective Green, g (s)	10.2		44.3		44.3	44.3
Actuated g/C Ratio	0.16		0.68		0.68	0.68
Clearance Time (s)	6.0		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	272		2369		286	2415
v/s Ratio Prot			0.32			c0.34
v/s Ratio Perm	c0.08				0.12	
v/c Ratio	0.49		0.47		0.18	0.50
Uniform Delay, d1	25.0		4.8		3.8	5.0
Progression Factor	1.00		0.29		0.74	0.82
Incremental Delay, d2	1.4		0.6		1.2	0.6
Delay (s)	26.4		2.0		3.9	4.7
Level of Service	C		A		A	A
Approach Delay (s)	26.4		2.0			4.7
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	79	8	147	13	52	982	157	1223
Future Volume (vph)	79	8	147	13	52	982	157	1223
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	5.0	5.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	24.0	24.0	25.0	25.0	25.0	25.0
Total Split (s)	24.0	24.0	24.0	24.0	41.0	41.0	41.0	41.0
Total Split (%)	36.9%	36.9%	36.9%	36.9%	63.1%	63.1%	63.1%	63.1%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.0	12.0	12.5	12.5	39.5	39.5	39.5	39.5
Actuated g/C Ratio	0.18	0.18	0.19	0.19	0.61	0.61	0.61	0.61
v/c Ratio	0.34	0.12	0.56	0.31	0.27	0.50	0.60	0.58
Control Delay	26.0	10.4	31.4	9.9	12.1	8.5	15.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	10.4	31.4	9.9	12.1	8.5	15.5	3.7
LOS	C	B	C	A	B	A	B	A
Approach Delay		20.7		21.8		8.7		5.0
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 10 (15%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: Street F/Doug Leavens Blvd & Ninth Line

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	79	40	147	119	52	1092	157	1276
v/c Ratio	0.34	0.12	0.56	0.31	0.27	0.50	0.60	0.58
Control Delay	26.0	10.4	31.4	9.9	12.1	8.5	15.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	10.4	31.4	9.9	12.1	8.5	15.5	3.7
Queue Length 50th (m)	7.8	0.7	15.0	2.7	2.3	29.8	3.0	12.3
Queue Length 95th (m)	16.0	6.3	26.7	12.2	9.9	52.4	#37.9	15.3
Internal Link Dist (m)		160.3		392.7		51.3		359.0
Turn Bay Length (m)			25.0		15.0		80.0	
Base Capacity (vph)	337	459	380	514	192	2196	261	2187
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.09	0.39	0.23	0.27	0.50	0.60	0.58

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	8	32	147	13	106	52	982	110	157	1223	53
Future Volume (vph)	79	8	32	147	13	106	52	982	110	157	1223	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.0	6.0		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	0.95	
Frt	1.00	0.88		1.00	0.87		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1621		1785	1624		1750	3595		1785	3590	
Flt Permitted	0.68	1.00		0.73	1.00		0.17	1.00		0.23	1.00	
Satd. Flow (perm)	1254	1621		1373	1624		318	3595		430	3590	
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)	79	8	32	147	13	106	52	982	110	157	1223	53
RTOR Reduction (vph)	0	26	0	0	73	0	0	11	0	0	4	0
Lane Group Flow (vph)	79	14	0	147	46	0	52	1081	0	157	1272	0
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.0	12.0		12.5	12.5		39.5	39.5		39.5	39.5	
Effective Green, g (s)	12.0	12.0		12.5	12.5		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.18	0.18		0.19	0.19		0.61	0.61		0.61	0.61	
Clearance Time (s)	6.5	6.5		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	3.0	
Lane Grp Cap (vph)	231	299		264	312		193	2184		261	2181	
v/s Ratio Prot		0.01			0.03			0.30			0.35	
v/s Ratio Perm	0.06			c0.11			0.16			c0.37		
v/c Ratio	0.34	0.05		0.56	0.15		0.27	0.50		0.60	0.58	
Uniform Delay, d1	23.1	21.8		23.7	21.8		6.0	7.2		7.9	7.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.55	0.32	
Incremental Delay, d2	0.9	0.1		2.5	0.2		3.4	0.8		9.1	1.1	
Delay (s)	24.0	21.9		26.3	22.0		9.4	8.0		13.4	3.6	
Level of Service	C	C		C	C		A	A		B	A	
Approach Delay (s)		23.2			24.4			8.0			4.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	0	270	0	92	1246	40	1220
Future Volume (vph)	55	0	270	0	92	1246	40	1220
Turn Type	Perm	NA	D.Pm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		4		2		6	
Detector Phase	4	4	4	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.0	8.0
Minimum Split (s)	23.5	23.5	23.5	24.0	23.0	23.0	11.0	23.0
Total Split (s)	24.0	24.0	24.0	24.0	40.0	40.0	11.0	51.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	53.3%	53.3%	14.7%	68.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	17.6	17.6	17.6	17.6	37.8	37.8	47.4	44.4
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.50	0.50	0.63	0.59
v/c Ratio	0.17	0.12	0.92	0.06	0.47	0.79	0.15	0.58
Control Delay	24.3	0.9	66.4	0.2	17.1	16.1	6.6	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	0.9	66.4	0.2	17.1	16.1	6.6	11.0
LOS	C	A	E	A	B	B	A	B
Approach Delay		12.6		59.4		16.1		10.9
Approach LOS		B		E		B		B

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 24 (32%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 81.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	55	270	32	92	1429	40	1244
v/c Ratio	0.17	0.12	0.92	0.06	0.47	0.79	0.15	0.58
Control Delay	24.3	0.9	66.4	0.2	17.1	16.1	6.6	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	0.9	66.4	0.2	17.1	16.1	6.6	11.0
Queue Length 50th (m)	5.7	0.0	34.2	0.0	9.9	91.9	1.8	48.5
Queue Length 95th (m)	13.8	1.0	#72.0	0.0	m15.1	m107.2	4.6	64.0
Internal Link Dist (m)		160.3		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	325	464	300	542	195	1810	267	2132
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.12	0.90	0.06	0.47	0.79	0.15	0.58

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	55	270	0	32	92	1246	183	40	1220	24
Future Volume (vph)	55	0	55	270	0	32	92	1246	183	40	1220	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1653	1597		1750	3566		1785	3603	
Flt Permitted	0.74	1.00		0.72	1.00		0.21	1.00		0.10	1.00	
Satd. Flow (perm)	1356	1566		1255	1597		387	3566		187	3603	
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	0	55	270	0	32	92	1246	183	40	1220	24
RTOR Reduction (vph)	0	42	0	0	24	0	0	14	0	0	2	0
Lane Group Flow (vph)	55	13	0	270	8	0	92	1415	0	40	1242	0
Heavy Vehicles (%)	2%	2%	2%	8%	2%	0%	2%	0%	3%	0%	1%	2%
Turn Type	Perm	NA		D.Pm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	17.6	17.6		17.6	17.6		36.2	36.2		44.4	44.4	
Effective Green, g (s)	17.6	17.6		17.6	17.6		36.2	36.2		44.4	44.4	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.48	0.48		0.59	0.59	
Clearance Time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	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)	318	367		294	374		186	1721		200	2132	
v/s Ratio Prot		0.01			0.00			c0.40		0.01	c0.34	
v/s Ratio Perm	0.04			c0.22			0.24			0.11		
v/c Ratio	0.17	0.04		0.92	0.02		0.49	0.82		0.20	0.58	
Uniform Delay, d1	22.9	22.1		28.0	22.1		13.2	16.6		10.9	9.5	
Progression Factor	1.00	1.00		1.00	1.00		0.82	0.84		1.00	1.00	
Incremental Delay, d2	0.3	0.0		31.7	0.0		5.2	2.6		0.5	1.2	
Delay (s)	23.2	22.2		59.7	22.1		16.0	16.6		11.4	10.7	
Level of Service	C	C		E	C		B	B		B	B	
Approach Delay (s)		22.7			55.7			16.6			10.7	
Approach LOS		C			E			B			B	

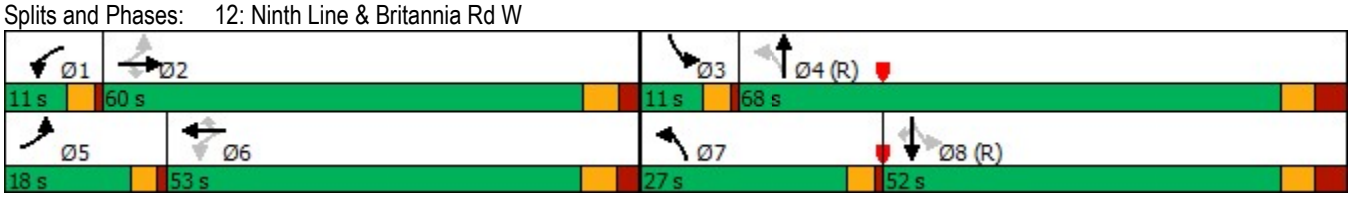
Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	277	695	469	92	1236	101	400	1077	83	1029	340
Future Volume (vph)	277	695	469	92	1236	101	400	1077	83	1029	340
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	3	8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	5	2	2	1	6	6	7	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0	12.0
Minimum Split (s)	11.0	26.5	26.5	11.0	26.7	26.7	11.0	47.7	11.0	47.7	47.7
Total Split (s)	18.0	60.0	60.0	11.0	53.0	53.0	27.0	68.0	11.0	52.0	52.0
Total Split (%)	12.0%	40.0%	40.0%	7.3%	35.3%	35.3%	18.0%	45.3%	7.3%	34.7%	34.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.7	2.7	1.0	3.7	1.0	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7	4.0	7.7	7.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	67.0	53.5	53.5	56.0	46.3	46.3	75.0	60.3	55.0	44.3	44.3
Actuated g/C Ratio	0.45	0.36	0.36	0.37	0.31	0.31	0.50	0.40	0.37	0.30	0.30
v/c Ratio	1.28	0.54	0.59	0.35	1.11	0.17	1.23	0.80	0.56	0.96	0.59
Control Delay	191.9	40.3	12.8	28.9	109.1	1.6	167.9	44.4	42.0	75.6	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	191.9	40.3	12.8	28.9	109.1	1.6	167.9	44.4	42.0	75.6	34.3
LOS	F	D	B	C	F	A	F	D	D	E	C
Approach Delay		60.5			96.4			76.0		64.0	
Approach LOS		E			F			E		E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 74.2	Intersection LOS: E
Intersection Capacity Utilization 118.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	277	695	469	92	1236	101	400	1160	83	1029	340
v/c Ratio	1.28	0.54	0.59	0.35	1.11	0.17	1.23	0.80	0.56	0.96	0.59
Control Delay	191.9	40.3	12.8	28.9	109.1	1.6	167.9	44.4	42.0	75.6	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	191.9	40.3	12.8	28.9	109.1	1.6	167.9	44.4	42.0	75.6	34.3
Queue Length 50th (m)	~81.1	79.6	24.1	14.5	~202.7	0.0	~120.1	145.7	12.1	150.6	54.0
Queue Length 95th (m)	#134.6	97.6	57.5	24.9	#241.8	2.5	#180.5	171.4	m19.3	m#188.0	m82.2
Internal Link Dist (m)		80.1			420.4			341.1		608.8	
Turn Bay Length (m)	80.0		80.0	70.0		70.0	75.0		60.0		60.0
Base Capacity (vph)	216	1288	794	263	1115	583	324	1453	149	1067	581
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.54	0.59	0.35	1.11	0.17	1.23	0.80	0.56	0.96	0.59

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.

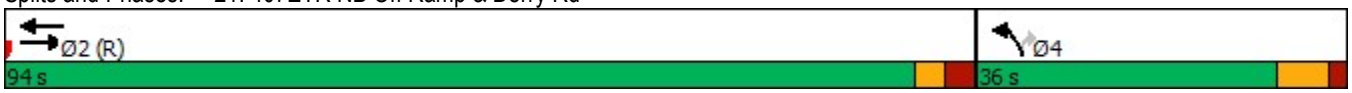
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	695	469	92	1236	101	400	1077	83	83	1029	340
Future Volume (vph)	277	695	469	92	1236	101	400	1077	83	83	1029	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7		4.0	7.7	7.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1767	3614	1597	1785	3614	1551	1767	3607		1716	3614	1581
Flt Permitted	0.08	1.00	1.00	0.29	1.00	1.00	0.08	1.00		0.12	1.00	1.00
Satd. Flow (perm)	147	3614	1597	553	3614	1551	154	3607		219	3614	1581
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)	277	695	469	92	1236	101	400	1077	83	83	1029	340
RTOR Reduction (vph)	0	0	225	0	0	70	0	4	0	0	0	114
Lane Group Flow (vph)	277	695	244	92	1236	31	400	1156	0	83	1029	226
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	3%	1%	0%	0%	4%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	64.5	53.5	53.5	53.3	46.3	46.3	71.3	60.3		51.3	44.3	44.3
Effective Green, g (s)	64.5	53.5	53.5	53.3	46.3	46.3	71.3	60.3		51.3	44.3	44.3
Actuated g/C Ratio	0.43	0.36	0.36	0.36	0.31	0.31	0.48	0.40		0.34	0.30	0.30
Clearance Time (s)	4.0	6.5	6.5	4.0	6.7	6.7	4.0	7.7		4.0	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	214	1288	569	253	1115	478	320	1450		144	1067	466
v/s Ratio Prot	c0.12	0.19		0.02	0.34		c0.19	0.32		0.03	0.28	
v/s Ratio Perm	c0.43		0.15	0.11		0.02	c0.40			0.17		0.14
v/c Ratio	1.29	0.54	0.43	0.36	1.11	0.07	1.25	0.80		0.58	0.96	0.48
Uniform Delay, d1	46.1	38.4	36.7	33.3	51.9	36.6	49.0	39.5		36.2	52.1	43.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.36	1.13	1.35
Incremental Delay, d2	162.6	1.6	2.4	0.9	61.9	0.3	135.8	4.7		4.3	17.2	2.8
Delay (s)	208.7	40.1	39.0	34.2	113.7	36.8	184.8	44.1		53.4	76.2	61.3
Level of Service	F	D	D	C	F	D	F	D		D	E	E
Approach Delay (s)		72.1			103.2			80.2			71.4	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	81.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	118.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1157	2247	67	392
Future Volume (vph)	1157	2247	67	392
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	94.0	94.0	36.0	36.0
Total Split (%)	72.3%	72.3%	27.7%	27.7%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	88.0	88.0	29.0	29.0
Actuated g/C Ratio	0.68	0.68	0.22	0.22
v/c Ratio	0.48	0.92	0.09	0.88
Control Delay	10.8	25.6	40.5	56.5
Queue Delay	0.0	18.5	0.0	0.0
Total Delay	10.8	44.1	40.5	56.5
LOS	B	D	D	E
Approach Delay	10.8	44.1	54.2	
Approach LOS	B	D	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 35.3	Intersection LOS: D
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1157	2247	67	392
v/c Ratio	0.48	0.92	0.09	0.88
Control Delay	10.8	25.6	40.5	56.5
Queue Delay	0.0	18.5	0.0	0.0
Total Delay	10.8	44.1	40.5	56.5
Queue Length 50th (m)	63.0	219.2	6.4	66.4
Queue Length 95th (m)	75.8	260.7	12.2	#117.6
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2422	2446	749	444
Starvation Cap Reductn	0	273	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.48	1.03	0.09	0.88

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1157	0	0	2247	67	392
Future Volume (vph)	1157	0	0	2247	67	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3614	3362	1597
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3614	3362	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1157	0	0	2247	67	392
RTOR Reduction (vph)	0	0	0	0	0	89
Lane Group Flow (vph)	1157	0	0	2247	67	303
Heavy Vehicles (%)	2%	0%	0%	1%	3%	0%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	88.0			88.0	29.0	29.0
Effective Green, g (s)	88.0			88.0	29.0	29.0
Actuated g/C Ratio	0.68			0.68	0.22	0.22
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2422			2446	749	356
v/s Ratio Prot	0.32			c0.62	0.02	
v/s Ratio Perm						c0.19
v/c Ratio	0.48			0.92	0.09	0.85
Uniform Delay, d1	10.0			17.9	40.0	48.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			7.0	0.2	21.9
Delay (s)	10.7			24.9	40.3	70.4
Level of Service	B			C	D	E
Approach Delay (s)	10.7			24.9	66.0	
Approach LOS	B			C	E	

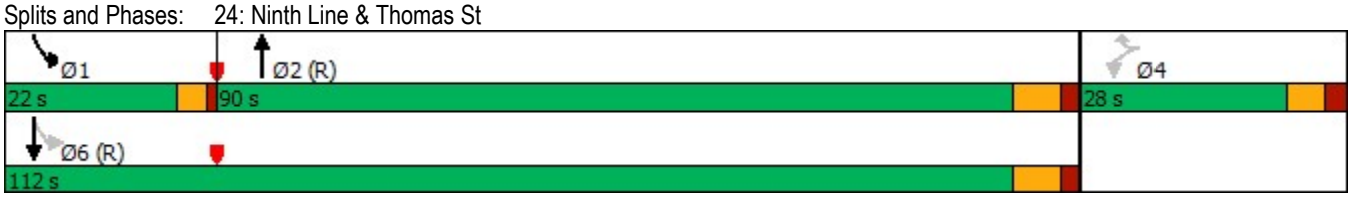
Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	167	277	1680	213	1281
Future Volume (vph)	167	277	1680	213	1281
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	28.0	28.0	90.0	22.0	112.0
Total Split (%)	20.0%	20.0%	64.3%	15.7%	80.0%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	17.9	17.9	89.0	111.6	108.6
Actuated g/C Ratio	0.13	0.13	0.64	0.80	0.78
v/c Ratio	0.75	0.73	0.81	0.83	0.46
Control Delay	79.3	26.2	13.6	61.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	26.2	13.6	61.5	6.4
LOS	E	C	B	E	A
Approach Delay	46.2		13.6		14.2
Approach LOS	D		B		B

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 22 (16%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 87.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	167	277	1842	213	1281
v/c Ratio	0.75	0.73	0.81	0.83	0.46
Control Delay	79.3	26.2	13.6	61.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	26.2	13.6	61.5	6.4
Queue Length 50th (m)	41.5	14.8	134.2	36.4	53.3
Queue Length 95th (m)	63.2	43.2	160.4	#69.1	70.0
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	267	414	2272	287	2777
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.63	0.67	0.81	0.74	0.46

Intersection Summary

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

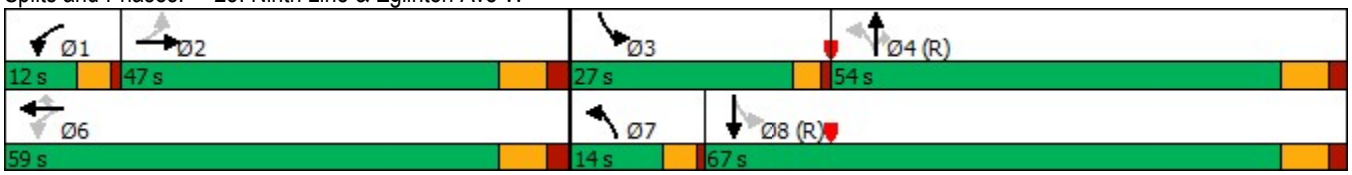
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	167	277	1680	162	213	1281
Future Volume (vph)	167	277	1680	162	213	1281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1744	1521	3569		1767	3579
Flt Permitted	0.95	1.00	1.00		0.05	1.00
Satd. Flow (perm)	1744	1521	3569		89	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	167	277	1680	162	213	1281
RTOR Reduction (vph)	0	187	5	0	0	0
Lane Group Flow (vph)	167	90	1837	0	213	1281
Confl. Peds. (#/hr)	6					
Heavy Vehicles (%)	1%	5%	1%	0%	1%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	17.9	17.9	88.9		108.6	108.6
Effective Green, g (s)	17.9	17.9	88.9		108.6	108.6
Actuated g/C Ratio	0.13	0.13	0.64		0.78	0.78
Clearance Time (s)	6.5	6.5	7.0		4.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	222	194	2266		257	2776
v/s Ratio Prot			0.51		c0.09	0.36
v/s Ratio Perm	c0.10	0.06			c0.55	
v/c Ratio	0.75	0.47	0.81		0.83	0.46
Uniform Delay, d1	58.9	56.6	19.2		45.1	5.5
Progression Factor	1.00	1.00	0.56		1.00	1.00
Incremental Delay, d2	13.4	1.8	2.1		19.3	0.6
Delay (s)	72.3	58.4	12.8		64.4	6.0
Level of Service	E	E	B		E	A
Approach Delay (s)	63.6		12.8			14.4
Approach LOS	E		B			B

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	54	554	133	694	537	103	1218	192	374	975
Future Volume (vph)	54	554	133	694	537	103	1218	192	374	975
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	1	6		7	4		3	8
Permitted Phases	2		6		6	4		4	8	
Detector Phase	2	2	1	6	6	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	40.0	11.0	40.0
Total Split (s)	47.0	47.0	12.0	59.0	59.0	14.0	54.0	54.0	27.0	67.0
Total Split (%)	33.6%	33.6%	8.6%	42.1%	42.1%	10.0%	38.6%	38.6%	19.3%	47.9%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	39.5	39.5	54.5	51.5	51.5	58.2	47.0	47.0	77.0	60.8
Actuated g/C Ratio	0.28	0.28	0.39	0.37	0.37	0.42	0.34	0.34	0.55	0.43
v/c Ratio	1.02	0.61	0.55	0.99	0.69	0.42	1.00	0.31	1.08	0.66
Control Delay	179.7	46.1	38.0	76.3	20.1	22.4	72.9	12.2	110.5	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	179.7	46.1	38.0	76.3	20.1	22.4	72.9	12.2	110.5	33.9
LOS	F	D	D	E	C	C	E	B	F	C
Approach Delay		57.0		50.4			61.8			54.4
Approach LOS		E		D			E			D

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 20 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 55.9	Intersection LOS: E
Intersection Capacity Utilization 119.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	54	608	133	694	537	103	1218	192	374	1024
v/c Ratio	1.02	0.61	0.55	0.99	0.69	0.42	1.00	0.31	1.08	0.66
Control Delay	179.7	46.1	38.0	76.3	20.1	22.4	72.9	12.2	110.5	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	179.7	46.1	38.0	76.3	20.1	22.4	72.9	12.2	110.5	33.9
Queue Length 50th (m)	~14.0	70.2	22.3	175.4	49.2	12.2	~164.6	9.8	~87.8	131.3
Queue Length 95th (m)	#40.9	88.5	36.1	#250.4	88.8	20.9	#209.2	27.0	m#141.0	157.8
Internal Link Dist (m)		373.3		388.7			291.0			258.7
Turn Bay Length (m)	20.0		35.0			65.0		30.0	65.0	
Base Capacity (vph)	53	999	243	699	773	255	1213	621	346	1560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.61	0.55	0.99	0.69	0.40	1.00	0.31	1.08	0.66

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	554	54	133	694	537	103	1218	192	374	975	49
Future Volume (vph)	54	554	54	133	694	537	103	1218	192	374	975	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0	7.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3525		1750	1902	1566	1785	3614	1581	1767	3590	
Flt Permitted	0.10	1.00		0.24	1.00	1.00	0.20	1.00	1.00	0.08	1.00	
Satd. Flow (perm)	190	3525		446	1902	1566	380	3614	1581	146	3590	
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)	54	554	54	133	694	537	103	1218	192	374	975	49
RTOR Reduction (vph)	0	5	0	0	0	198	0	0	90	0	2	0
Lane Group Flow (vph)	54	603	0	133	694	339	103	1218	102	374	1022	0
Heavy Vehicles (%)	0%	2%	4%	2%	1%	2%	0%	1%	1%	1%	1%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4		4	8		
Actuated Green, G (s)	39.5	39.5		51.5	51.5	51.5	55.7	47.0	47.0	74.0	60.8	
Effective Green, g (s)	39.5	39.5		51.5	51.5	51.5	55.7	47.0	47.0	74.0	60.8	
Actuated g/C Ratio	0.28	0.28		0.37	0.37	0.37	0.40	0.34	0.34	0.53	0.43	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	53	994		233	699	576	238	1213	530	343	1559	
v/s Ratio Prot		0.17		0.03	c0.36		0.03	0.34		c0.18	0.28	
v/s Ratio Perm	0.28			0.18		0.22	0.15		0.06	c0.40		
v/c Ratio	1.02	0.61		0.57	0.99	0.59	0.43	1.00	0.19	1.09	0.66	
Uniform Delay, d1	50.2	43.5		31.8	44.1	35.7	27.7	46.5	33.0	46.2	31.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.26	1.03	
Incremental Delay, d2	129.1	2.7		3.4	32.3	4.4	1.3	26.8	0.8	65.7	1.4	
Delay (s)	179.4	46.3		35.1	76.4	40.1	29.0	73.3	33.8	123.9	33.5	
Level of Service	F	D		D	E	D	C	E	C	F	C	
Approach Delay (s)		57.1			58.1			65.3			57.7	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	60.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	119.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	97	1751	56	1425
Future Volume (vph)	97	1751	56	1425
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	24.0	24.0	24.0
Total Split (s)	24.0	46.0	46.0	46.0
Total Split (%)	34.3%	65.7%	65.7%	65.7%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.1	45.9	45.9	45.9
Actuated g/C Ratio	0.17	0.66	0.66	0.66
v/c Ratio	0.60	0.78	0.53	0.61
Control Delay	31.4	4.0	25.6	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	4.0	25.6	6.2
LOS	C	A	C	A
Approach Delay	31.4	4.0		6.9
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 29 (41%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	189	1822	56	1425
v/c Ratio	0.60	0.78	0.53	0.61
Control Delay	31.4	4.0	25.6	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	4.0	25.6	6.2
Queue Length 50th (m)	19.2	3.1	2.6	36.5
Queue Length 95th (m)	33.1	19.2	m#22.0	53.5
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	462	2335	106	2344
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.78	0.53	0.61

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.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	97	92	1751	71	56	1425
Future Volume (vph)	97	92	1751	71	56	1425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.93		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1750		3560		1785	3579
Flt Permitted	0.97		1.00		0.09	1.00
Satd. Flow (perm)	1750		3560		164	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	92	1751	71	56	1425
RTOR Reduction (vph)	14	0	3	0	0	0
Lane Group Flow (vph)	175	0	1819	0	56	1425
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.1		45.9		45.9	45.9
Effective Green, g (s)	12.1		45.9		45.9	45.9
Actuated g/C Ratio	0.17		0.66		0.66	0.66
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	302		2334		107	2346
v/s Ratio Prot			c0.51			0.40
v/s Ratio Perm	c0.10				0.34	
v/c Ratio	0.58		0.78		0.52	0.61
Uniform Delay, d1	26.6		8.5		6.3	6.9
Progression Factor	1.00		0.29		0.84	0.68
Incremental Delay, d2	2.7		1.2		15.5	1.1
Delay (s)	29.3		3.7		20.8	5.7
Level of Service	C		A		C	A
Approach Delay (s)	29.3		3.7			6.3
Approach LOS	C		A			A

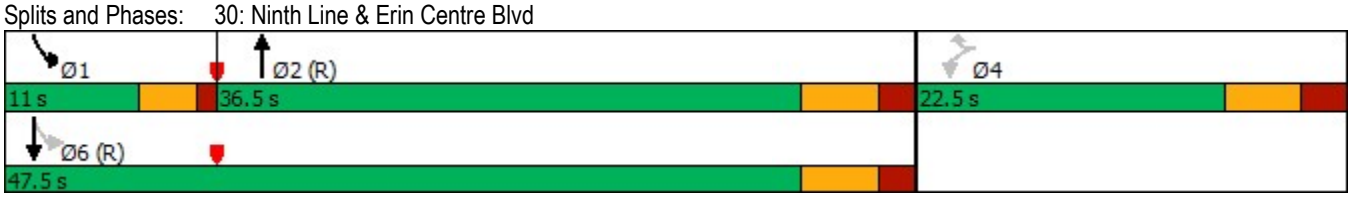
Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	114	158	1680	143	1322
Future Volume (vph)	114	158	1680	143	1322
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	22.5	22.5	36.5	11.0	47.5
Total Split (%)	32.1%	32.1%	52.1%	15.7%	67.9%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.2	10.2	37.8	49.3	47.3
Actuated g/C Ratio	0.15	0.15	0.54	0.70	0.68
v/c Ratio	0.44	0.43	0.93	0.47	0.54
Control Delay	32.3	8.8	30.8	17.7	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	8.8	30.8	17.7	5.0
LOS	C	A	C	B	A
Approach Delay	18.7		30.8		6.2
Approach LOS	B		C		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 65 (93%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 78.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	114	158	1786	143	1322
v/c Ratio	0.44	0.43	0.93	0.47	0.54
Control Delay	32.3	8.8	30.8	17.7	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	8.8	30.8	17.7	5.0
Queue Length 50th (m)	12.9	0.0	155.5	8.4	16.6
Queue Length 95th (m)	24.2	12.4	#267.3	21.8	41.5
Internal Link Dist (m)	358.4		296.2		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	405	486	1924	303	2443
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.33	0.93	0.47	0.54

Intersection Summary

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

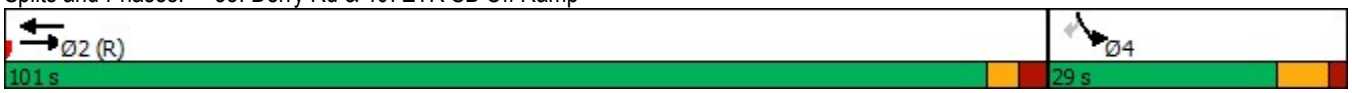
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	114	158	1680	106	143	1322
Future Volume (vph)	114	158	1680	106	143	1322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1776	1597	3556		1767	3614
Flt Permitted	0.95	1.00	1.00		0.10	1.00
Satd. Flow (perm)	1776	1597	3556		181	3614
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	114	158	1680	106	143	1322
RTOR Reduction (vph)	0	135	6	0	0	0
Lane Group Flow (vph)	114	23	1780	0	143	1322
Confl. Peds. (#/hr)	4			1	1	
Heavy Vehicles (%)	0%	0%	1%	11%	1%	1%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	10.2	10.2	37.0		47.3	47.3
Effective Green, g (s)	10.2	10.2	37.0		47.3	47.3
Actuated g/C Ratio	0.15	0.15	0.53		0.68	0.68
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	258	232	1879		265	2442
v/s Ratio Prot			c0.50		0.05	c0.37
v/s Ratio Perm	c0.06	0.01			0.32	
v/c Ratio	0.44	0.10	0.95		0.54	0.54
Uniform Delay, d1	27.3	25.9	15.6		13.6	5.8
Progression Factor	1.00	1.00	1.36		2.72	0.70
Incremental Delay, d2	1.2	0.2	10.1		1.7	0.7
Delay (s)	28.5	26.1	31.3		38.6	4.7
Level of Service	C	C	C		D	A
Approach Delay (s)	27.1		31.3			8.0
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1265	2214	361	180
Future Volume (vph)	1265	2214	361	180
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	101.0	101.0	29.0	29.0
Total Split (%)	77.7%	77.7%	22.3%	22.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	98.3	98.3	18.7	18.7
Actuated g/C Ratio	0.76	0.76	0.14	0.14
v/c Ratio	0.48	0.81	0.73	0.74
Control Delay	7.0	13.6	62.3	66.1
Queue Delay	0.0	0.6	0.0	0.0
Total Delay	7.0	14.2	62.3	66.1
LOS	A	B	E	E
Approach Delay	7.0	14.2	63.6	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1265	2214	361	180
v/c Ratio	0.48	0.81	0.73	0.74
Control Delay	7.0	13.6	62.3	66.1
Queue Delay	0.0	0.6	0.0	0.0
Total Delay	7.0	14.2	62.3	66.1
Queue Length 50th (m)	52.3	151.9	42.4	37.3
Queue Length 95th (m)	70.5	201.7	56.0	59.0
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	2654	2733	580	284
Starvation Cap Reductn	0	194	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.48	0.87	0.62	0.63

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1265	2214	0	361	180
Future Volume (vph)	0	1265	2214	0	361	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3510	3614		3429	1597
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3510	3614		3429	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1265	2214	0	361	180
RTOR Reduction (vph)	0	0	0	0	0	15
Lane Group Flow (vph)	0	1265	2214	0	361	165
Heavy Vehicles (%)	0%	4%	1%	0%	1%	0%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		98.3	98.3		18.7	18.7
Effective Green, g (s)		98.3	98.3		18.7	18.7
Actuated g/C Ratio		0.76	0.76		0.14	0.14
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2654	2732		493	229
v/s Ratio Prot		0.36	c0.61		c0.11	
v/s Ratio Perm						0.10
v/c Ratio		0.48	0.81		0.73	0.72
Uniform Delay, d1		6.0	10.0		53.3	53.2
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6	2.7		5.6	10.7
Delay (s)		6.7	12.7		58.8	63.9
Level of Service		A	B		E	E
Approach Delay (s)		6.7	12.7		60.5	
Approach LOS		A	B		E	

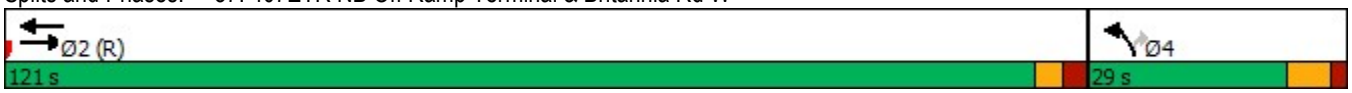
Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1419	1882	123	118
Future Volume (vph)	1419	1882	123	118
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	121.0	121.0	29.0	29.0
Total Split (%)	80.7%	80.7%	19.3%	19.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	121.2	121.2	15.8	15.8
Actuated g/C Ratio	0.81	0.81	0.11	0.11
v/c Ratio	0.49	0.64	0.67	0.47
Control Delay	5.5	7.5	81.3	23.1
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	5.5	8.7	81.3	23.1
LOS	A	A	F	C
Approach Delay	5.5	8.7	52.8	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 69.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp Terminal & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1419	1882	123	118
v/c Ratio	0.49	0.64	0.67	0.47
Control Delay	5.5	7.5	81.3	23.1
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	5.5	8.7	81.3	23.1
Queue Length 50th (m)	54.6	91.5	33.0	6.1
Queue Length 95th (m)	79.7	132.8	51.0	23.3
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2919	2919	256	312
Starvation Cap Reductn	0	740	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.86	0.48	0.38

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1419	0	0	1882	123	118
Future Volume (vph)	1419	0	0	1882	123	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3614	1750	1581
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3614	1750	1581
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1419	0	0	1882	123	118
RTOR Reduction (vph)	0	0	0	0	0	84
Lane Group Flow (vph)	1419	0	0	1882	123	34
Heavy Vehicles (%)	1%	0%	0%	1%	2%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	121.2			121.2	15.8	15.8
Effective Green, g (s)	121.2			121.2	15.8	15.8
Actuated g/C Ratio	0.81			0.81	0.11	0.11
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2920			2920	184	166
v/s Ratio Prot	0.39			c0.52	c0.07	
v/s Ratio Perm						0.02
v/c Ratio	0.49			0.64	0.67	0.20
Uniform Delay, d1	4.6			5.8	64.6	61.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.6			1.1	8.9	0.6
Delay (s)	5.1			6.9	73.4	62.0
Level of Service	A			A	E	E
Approach Delay (s)	5.1			6.9	67.8	
Approach LOS	A			A	E	

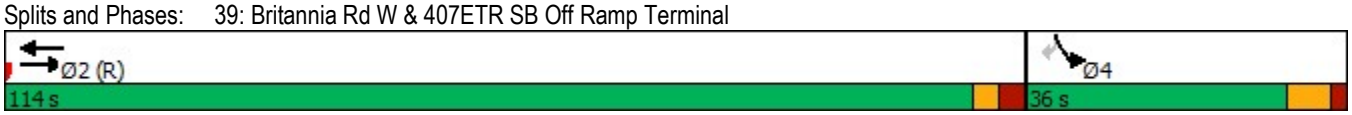
Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1412	1888	164	173
Future Volume (vph)	1412	1888	164	173
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	114.0	114.0	36.0	36.0
Total Split (%)	76.0%	76.0%	24.0%	24.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	108.0	108.0	29.0	29.0
Actuated g/C Ratio	0.72	0.72	0.19	0.19
v/c Ratio	0.54	0.73	0.48	0.54
Control Delay	10.6	14.4	59.2	51.0
Queue Delay	0.0	0.8	0.0	0.0
Total Delay	10.6	15.2	59.2	51.0
LOS	B	B	E	D
Approach Delay	10.6	15.2	55.0	
Approach LOS	B	B	D	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp Terminal



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1412	1888	164	173
v/c Ratio	0.54	0.73	0.48	0.54
Control Delay	10.6	14.4	59.2	51.0
Queue Delay	0.0	0.8	0.0	0.0
Total Delay	10.6	15.2	59.2	51.0
Queue Length 50th (m)	85.4	145.7	40.4	35.1
Queue Length 95th (m)	99.4	167.6	62.1	58.1
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2602	2602	341	322
Starvation Cap Reductn	0	374	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.85	0.48	0.54

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1412	1888	0	164	173
Future Volume (vph)	0	1412	1888	0	164	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.7	3.7	3.7	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3614		1767	1536
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3614		1767	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1412	1888	0	164	173
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	0	1412	1888	0	164	147
Heavy Vehicles (%)	0%	1%	1%	0%	1%	4%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		108.0	108.0		29.0	29.0
Effective Green, g (s)		108.0	108.0		29.0	29.0
Actuated g/C Ratio		0.72	0.72		0.19	0.19
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2602	2602		341	296
v/s Ratio Prot		0.39	c0.52		0.09	
v/s Ratio Perm						c0.10
v/c Ratio		0.54	0.73		0.48	0.50
Uniform Delay, d1		9.7	12.3		53.8	54.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8	1.8		4.8	5.9
Delay (s)		10.5	14.1		58.6	59.9
Level of Service		B	B		E	E
Approach Delay (s)		10.5	14.1		59.2	
Approach LOS		B	B		E	

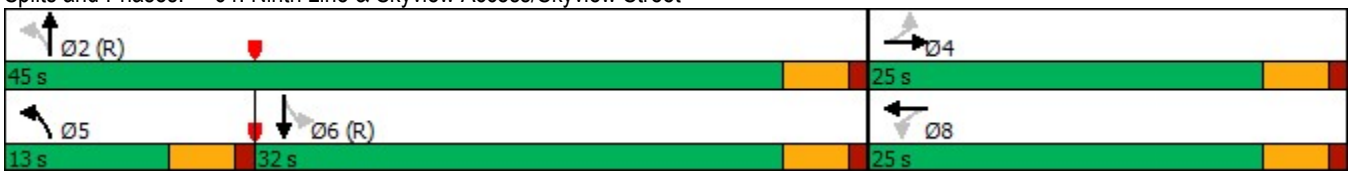
Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	78	5	4	5	293	1630	14	1255
Future Volume (vph)	78	5	4	5	293	1630	14	1255
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	9.5	24.0	24.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	13.0	45.0	32.0	32.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	18.6%	64.3%	45.7%	45.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.3	9.3	9.3	9.3	51.7	51.7	34.0	34.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.74	0.74	0.49	0.49
v/c Ratio	0.42	0.52	0.04	0.04	0.67	0.63	0.10	0.82
Control Delay	34.0	10.3	25.0	20.1	18.3	11.6	20.3	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	18.3	11.6	20.3	26.1
LOS	C	B	C	C	B	B	C	C
Approach Delay		17.1		21.6		12.6		26.0
Approach LOS		B		C		B		C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 78.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 64: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	78	194	4	9	293	1635	14	1375
v/c Ratio	0.42	0.52	0.04	0.04	0.67	0.63	0.10	0.82
Control Delay	34.0	10.3	25.0	20.1	18.3	11.6	20.3	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	18.3	11.6	20.3	26.1
Queue Length 50th (m)	8.8	0.5	0.4	0.6	28.1	170.5	1.2	91.4
Queue Length 95th (m)	18.4	14.4	2.5	3.6	m27.9	m174.4	m2.6	#139.1
Internal Link Dist (m)		134.3		117.6		258.7		135.3
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	405	594	238	506	436	2584	134	1684
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.33	0.02	0.02	0.67	0.63	0.10	0.82

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	5	189	4	5	4	293	1630	5	14	1255	120
Future Volume (vph)	78	5	189	4	5	4	293	1630	5	14	1255	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1573		1750	1719		1750	3498		1750	3454	
Flt Permitted	0.75	1.00		0.44	1.00		0.10	1.00		0.15	1.00	
Satd. Flow (perm)	1385	1573		814	1719		191	3498		278	3454	
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)	78	5	189	4	5	4	293	1630	5	14	1255	120
RTOR Reduction (vph)	0	164	0	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	78	30	0	4	6	0	293	1635	0	14	1366	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Effective Green, g (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.49	0.49	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	208		108	228		435	2583		135	1677	
v/s Ratio Prot		0.02			0.00		0.13	c0.47			c0.40	
v/s Ratio Perm	c0.06			0.00			0.37			0.05		
v/c Ratio	0.42	0.14		0.04	0.02		0.67	0.63		0.10	0.81	
Uniform Delay, d1	27.9	26.8		26.4	26.4		15.3	4.5		9.7	15.3	
Progression Factor	1.00	1.00		1.00	1.00		1.29	2.21		1.46	1.33	
Incremental Delay, d2	1.6	0.3		0.1	0.0		2.0	0.6		1.3	3.9	
Delay (s)	29.5	27.2		26.6	26.4		21.8	10.5		15.6	24.2	
Level of Service	C	C		C	C		C	B		B	C	
Approach Delay (s)		27.8			26.5			12.2			24.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Site Access

04/22/2021

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	22	38	1793	1417	20
Future Volume (Veh/h)	12	22	38	1793	1417	20
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	22	38	1793	1417	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				159	320	
pX, platoon unblocked	0.85	0.79	0.79			
vC, conflicting volume	2400	718	1437			
vC1, stage 1 conf vol	1427					
vC2, stage 2 conf vol	972					
vCu, unblocked vol	1193	123	1029			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	93			
cM capacity (veh/h)	234	718	532			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	22	38	896	896	945	492
Volume Left	12	0	38	0	0	0	0
Volume Right	0	22	0	0	0	0	20
cSH	234	718	532	1700	1700	1700	1700
Volume to Capacity	0.05	0.03	0.07	0.53	0.53	0.56	0.29
Queue Length 95th (m)	1.1	0.7	1.6	0.0	0.0	0.0	0.0
Control Delay (s)	21.2	10.2	12.3	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	14.1		0.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	25	22	0	17	32	1253	60	42	1245	120
Future Volume (Veh/h)	18	0	25	22	0	17	32	1253	60	42	1245	120
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)	18	0	25	22	0	17	32	1253	60	42	1245	120
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.67	0.67		0.67	0.67	0.67				0.67		
vC, conflicting volume	2096	2766	682	2078	2796	656	1365			1313		
vC1, stage 1 conf vol	1389	1389		1347	1347							
vC2, stage 2 conf vol	708	1377		732	1449							
vCu, unblocked vol	1653	2651	682	1626	2696	0	1365			485		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	94	90	100	98	94			94		
cM capacity (veh/h)	135	151	392	215	131	732	499			721		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	18	25	39	32	835	478	42	830	535
Volume Left	18	0	22	32	0	0	42	0	0
Volume Right	0	25	17	0	0	60	0	0	120
cSH	135	392	311	499	1700	1700	721	1700	1700
Volume to Capacity	0.13	0.06	0.13	0.06	0.49	0.28	0.06	0.49	0.31
Queue Length 95th (m)	3.1	1.4	3.0	1.4	0.0	0.0	1.3	0.0	0.0
Control Delay (s)	35.7	14.8	18.3	12.7	0.0	0.0	10.3	0.0	0.0
Lane LOS	E	B	C	B			B		
Approach Delay (s)	23.6		18.3	0.3			0.3		
Approach LOS	C		C						

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	94	43	1652	205	25	1411
Future Volume (Veh/h)	94	43	1652	205	25	1411
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)	94	43	1652	205	25	1411
Pedestrians			1			
Lane Width (m)			3.7			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						365
pX, platoon unblocked	0.74					
vC, conflicting volume	2511	928			1857	
vC1, stage 1 conf vol	1754					
vC2, stage 2 conf vol	756					
vCu, unblocked vol	2335	928			1857	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	23	84			92	
cM capacity (veh/h)	122	273			330	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	137	1101	756	25	706	706
Volume Left	94	0	0	25	0	0
Volume Right	43	0	205	0	0	0
cSH	147	1700	1700	330	1700	1700
Volume to Capacity	0.93	0.65	0.44	0.08	0.41	0.41
Queue Length 95th (m)	45.8	0.0	0.0	1.7	0.0	0.0
Control Delay (s)	115.7	0.0	0.0	16.8	0.0	0.0
Lane LOS	F			C		
Approach Delay (s)	115.7	0.0		0.3		
Approach LOS	F					

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	15	28	1181	1360	46
Future Volume (Veh/h)	25	15	28	1181	1360	46
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)	25	15	28	1181	1360	46
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					397	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	2030	703	1406			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1766	80	974			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	55	98	95			
cM capacity (veh/h)	56	758	554			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	25	15	28	590	590	907	499
Volume Left	25	0	28	0	0	0	0
Volume Right	0	15	0	0	0	0	46
cSH	56	758	554	1700	1700	1700	1700
Volume to Capacity	0.45	0.02	0.05	0.35	0.35	0.53	0.29
Queue Length 95th (m)	11.8	0.4	1.1	0.0	0.0	0.0	0.0
Control Delay (s)	113.5	9.8	11.8	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	74.6		0.3			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	5	8	1102	1353	57
Future Volume (Veh/h)	12	5	8	1102	1353	57
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	5	8	1102	1353	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				383	216	
pX, platoon unblocked	0.88	0.82	0.82			
vC, conflicting volume	1948	705	1410			
vC1, stage 1 conf vol	1382					
vC2, stage 2 conf vol	567					
vCu, unblocked vol	1267	217	1072			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	98			
cM capacity (veh/h)	240	649	533			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	5	8	551	551	902	508
Volume Left	12	0	8	0	0	0	0
Volume Right	0	5	0	0	0	0	57
cSH	240	649	533	1700	1700	1700	1700
Volume to Capacity	0.05	0.01	0.02	0.32	0.32	0.53	0.30
Queue Length 95th (m)	1.1	0.2	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	20.8	10.6	11.9	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	17.8		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

2041 Synchro Results

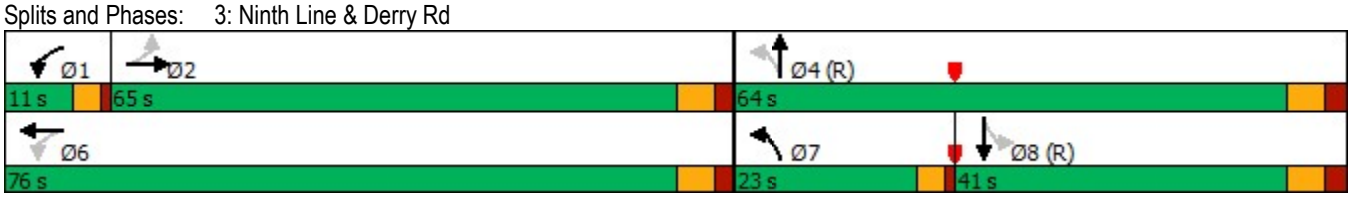
Appendix G

2041 Synchro Results – Scenario 1

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	400	1469	122	581	400	858	23	656
Future Volume (vph)	400	1469	122	581	400	858	23	656
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases		2	1	6	7	4		8
Permitted Phases	2		6		4		8	
Detector Phase	2	2	1	6	7	4	8	8
Switch Phase								
Minimum Initial (s)	8.0	8.0	7.0	8.0	7.0	8.0	8.0	8.0
Minimum Split (s)	30.1	30.1	11.0	30.1	11.0	29.4	29.4	29.4
Total Split (s)	65.0	65.0	11.0	76.0	23.0	64.0	41.0	41.0
Total Split (%)	46.4%	46.4%	7.9%	54.3%	16.4%	45.7%	29.3%	29.3%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.1	2.1	1.0	2.1	1.0	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	4.0	6.1	4.0	6.4	6.4	6.4
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	Max	Max	None	Max	None	C-Max	C-Max	C-Max
Act Effct Green (s)	58.9	58.9	72.0	69.9	60.0	57.6	34.6	34.6
Actuated g/C Ratio	0.42	0.42	0.51	0.50	0.43	0.41	0.25	0.25
v/c Ratio	1.29	1.11	0.87	0.36	1.37	0.76	0.27	1.16
Control Delay	189.1	98.1	74.1	21.8	218.7	32.2	52.8	125.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	189.1	98.1	74.1	21.8	218.7	32.2	52.8	125.8
LOS	F	F	E	C	F	C	D	F
Approach Delay		115.7		30.4		81.9		124.2
Approach LOS		F		C		F		F

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 18 (13%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 96.2	Intersection LOS: F
Intersection Capacity Utilization 123.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	400	1670	122	625	400	1099	23	1047
v/c Ratio	1.29	1.11	0.87	0.36	1.37	0.76	0.27	1.16
Control Delay	189.1	98.1	74.1	21.8	218.7	32.2	52.8	125.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	189.1	98.1	74.1	21.8	218.7	32.2	52.8	125.8
Queue Length 50th (m)	~129.7	~255.4	16.5	49.2	~121.2	89.8	4.8	~157.0
Queue Length 95th (m)	#187.9	#295.0	#50.4	62.1	#181.4	127.5	13.3	#196.0
Internal Link Dist (m)		119.7		244.5		681.0		237.0
Turn Bay Length (m)	75.0		80.0		130.0		95.0	
Base Capacity (vph)	309	1502	140	1739	293	1452	84	905
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	1.29	1.11	0.87	0.36	1.37	0.76	0.27	1.16

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
Future Volume (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.1	6.1		4.0	6.1		4.0	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.99		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1684	3553		1733	3477		1750	3488		1716	3412	
Flt Permitted	0.41	1.00		0.06	1.00		0.10	1.00		0.19	1.00	
Satd. Flow (perm)	735	3553		116	3477		191	3488		339	3412	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
RTOR Reduction (vph)	0	8	0	0	4	0	0	18	0	0	62	0
Lane Group Flow (vph)	400	1662	0	122	621	0	400	1081	0	23	985	0
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	58.9	58.9		69.9	69.9		57.6	57.6		34.6	34.6	
Effective Green, g (s)	58.9	58.9		69.9	69.9		57.6	57.6		34.6	34.6	
Actuated g/C Ratio	0.42	0.42		0.50	0.50		0.41	0.41		0.25	0.25	
Clearance Time (s)	6.1	6.1		4.0	6.1		4.0	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	309	1494		138	1736		290	1435		83	843	
v/s Ratio Prot		0.47		c0.04	0.18		c0.19	0.31			0.29	
v/s Ratio Perm	c0.54			0.39			c0.38			0.07		
v/c Ratio	1.29	1.11		0.88	0.36		1.38	0.75		0.28	1.17	
Uniform Delay, d1	40.5	40.5		33.8	21.4		43.5	35.1		42.6	52.7	
Progression Factor	1.00	1.00		1.00	1.00		1.27	0.85		1.00	1.00	
Incremental Delay, d2	154.5	60.7		43.7	0.6		186.5	2.8		8.1	88.3	
Delay (s)	195.0	101.2		77.5	21.9		241.8	32.7		50.7	141.0	
Level of Service	F	F		E	C		F	C		D	F	
Approach Delay (s)		119.4			31.0			88.5			139.0	
Approach LOS		F			C			F			F	

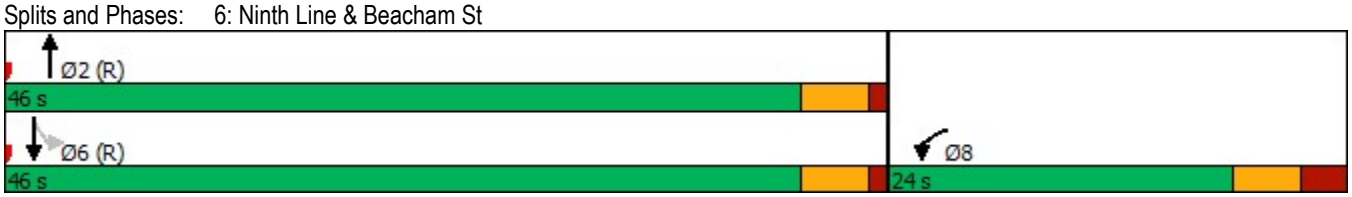
Intersection Summary			
HCM 2000 Control Delay	102.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	123.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	130	1423	90	946
Future Volume (vph)	130	1423	90	946
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	22.5	22.5	22.5
Total Split (s)	24.0	46.0	46.0	46.0
Total Split (%)	34.3%	65.7%	65.7%	65.7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.6	46.9	46.9	46.9
Actuated g/C Ratio	0.18	0.67	0.67	0.67
v/c Ratio	0.64	0.65	0.64	0.40
Control Delay	29.2	17.3	14.4	2.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.2	17.3	14.4	2.8
LOS	C	B	B	A
Approach Delay	29.2	17.3		3.8
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 59 (84%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 75.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	225	1551	90	946
v/c Ratio	0.64	0.65	0.64	0.40
Control Delay	29.2	17.3	14.4	2.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.2	17.3	14.4	2.8
Queue Length 50th (m)	20.3	101.9	3.6	17.4
Queue Length 95th (m)	35.4	m126.3	m4.3	m20.4
Internal Link Dist (m)	168.5	176.6		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	482	2375	141	2372
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.65	0.64	0.40

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	95	1423	128	90	946
Future Volume (vph)	130	95	1423	128	90	946
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1751		3534		1785	3544
Flt Permitted	0.97		1.00		0.11	1.00
Satd. Flow (perm)	1751		3534		213	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	95	1423	128	90	946
RTOR Reduction (vph)	35	0	8	0	0	0
Lane Group Flow (vph)	190	0	1543	0	90	946
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	12.6		46.9		46.9	46.9
Effective Green, g (s)	12.6		46.9		46.9	46.9
Actuated g/C Ratio	0.18		0.67		0.67	0.67
Clearance Time (s)	6.0		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	315		2367		142	2374
v/s Ratio Prot	c0.11		c0.44			0.27
v/s Ratio Perm					0.42	
v/c Ratio	0.60		0.65		0.63	0.40
Uniform Delay, d1	26.4		6.8		6.6	5.2
Progression Factor	1.00		2.13		1.03	0.49
Incremental Delay, d2	3.2		0.9		2.0	0.0
Delay (s)	29.6		15.3		8.8	2.6
Level of Service	C		B		A	A
Approach Delay (s)	29.6		15.3			3.1
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	133	13	111	5	17	1376	136	934
Future Volume (vph)	133	13	111	5	17	1376	136	934
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	24.0	24.0	25.0	25.0	11.0	25.0
Total Split (s)	24.0	24.0	24.0	24.0	35.0	35.0	11.0	46.0
Total Split (%)	34.3%	34.3%	34.3%	34.3%	50.0%	50.0%	15.7%	65.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	13.2	13.2	13.2	13.2	34.7	34.7	46.8	43.8
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.50	0.50	0.67	0.63
v/c Ratio	0.65	0.19	0.45	0.43	0.06	0.86	0.46	0.43
Control Delay	40.3	10.1	30.2	7.3	13.5	25.4	16.2	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	10.1	30.2	7.3	13.5	25.4	16.2	13.8
LOS	D	B	C	A	B	C	B	B
Approach Delay		30.2		15.6		25.3		14.1
Approach LOS		C		B		C		B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 88.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	67	111	194	17	1512	136	951
v/c Ratio	0.65	0.19	0.45	0.43	0.06	0.86	0.46	0.43
Control Delay	40.3	10.1	30.2	7.3	13.5	25.4	16.2	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	10.1	30.2	7.3	13.5	25.4	16.2	13.8
Queue Length 50th (m)	14.9	1.3	12.0	0.5	1.1	84.6	12.8	69.0
Queue Length 95th (m)	27.8	8.9	22.7	13.0	4.6	#144.4	29.4	81.7
Internal Link Dist (m)		167.3		392.7		51.3		374.5
Turn Bay Length (m)			25.0		15.0		80.0	
Base Capacity (vph)	281	456	334	548	274	1756	293	2235
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	0.47	0.15	0.33	0.35	0.06	0.86	0.46	0.43

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	13	54	111	5	189	17	1376	136	136	934	17
Future Volume (vph)	133	13	54	111	5	189	17	1376	136	136	934	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.88		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1619		1733	1588		1750	3524		1750	3569	
Flt Permitted	0.59	1.00		0.71	1.00		0.30	1.00		0.11	1.00	
Satd. Flow (perm)	1095	1619		1301	1588		554	3524		195	3569	
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)	133	13	54	111	5	189	17	1376	136	136	934	17
RTOR Reduction (vph)	0	44	0	0	153	0	0	9	0	0	1	0
Lane Group Flow (vph)	133	23	0	111	41	0	17	1503	0	136	950	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.2	13.2		13.2	13.2		33.8	33.8		43.8	43.8	
Effective Green, g (s)	13.2	13.2		13.2	13.2		33.8	33.8		43.8	43.8	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.48	0.48		0.63	0.63	
Clearance Time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	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)	206	305		245	299		267	1701		255	2233	
v/s Ratio Prot		0.01			0.03			c0.43		c0.05	0.27	
v/s Ratio Perm	c0.12			0.09			0.03			0.29		
v/c Ratio	0.65	0.08		0.45	0.14		0.06	0.88		0.53	0.43	
Uniform Delay, d1	26.2	23.4		25.2	23.7		9.7	16.3		11.4	6.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		2.08	1.85	
Incremental Delay, d2	6.8	0.1		1.3	0.2		0.5	7.1		2.0	0.6	
Delay (s)	33.0	23.5		26.5	23.9		10.1	23.4		25.7	12.9	
Level of Service	C	C		C	C		B	C		C	B	
Approach Delay (s)		29.8			24.8			23.2			14.5	
Approach LOS		C			C			C			B	

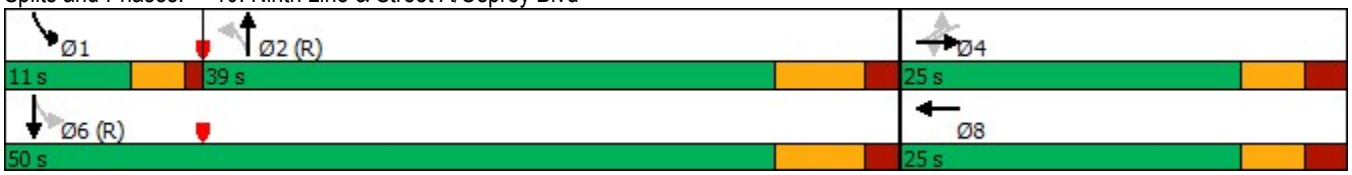
Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	0	232	0	30	1135	30	1065
Future Volume (vph)	93	0	232	0	30	1135	30	1065
Turn Type	Perm	NA	D.Pm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		4		2		6	
Detector Phase	4	4	4	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.0	8.0
Minimum Split (s)	23.5	23.5	23.5	24.0	23.0	23.0	11.0	23.0
Total Split (s)	25.0	25.0	25.0	25.0	39.0	39.0	11.0	50.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	52.0%	52.0%	14.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	17.2	17.2	17.2	17.2	40.4	40.4	47.8	44.8
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.54	0.54	0.64	0.60
v/c Ratio	0.31	0.21	0.83	0.16	0.11	0.67	0.10	0.50
Control Delay	26.3	4.6	52.4	0.7	10.1	13.9	6.4	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	4.6	52.4	0.7	10.1	13.9	6.4	10.1
LOS	C	A	D	A	B	B	A	B
Approach Delay		15.5		38.4		13.8		10.0
Approach LOS		B		D		B		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 31 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 65.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	93	232	86	30	1254	30	1073
v/c Ratio	0.31	0.21	0.83	0.16	0.11	0.67	0.10	0.50
Control Delay	26.3	4.6	52.4	0.7	10.1	13.9	6.4	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	4.6	52.4	0.7	10.1	13.9	6.4	10.1
Queue Length 50th (m)	9.8	0.0	27.8	0.0	1.5	54.5	1.4	40.7
Queue Length 95th (m)	20.7	6.8	#58.0	0.0	m4.2	94.3	3.9	54.3
Internal Link Dist (m)		118.2		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	327	483	310	560	264	1863	294	2137
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	0.28	0.19	0.75	0.15	0.11	0.67	0.10	0.50

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	93	232	0	86	30	1135	119	30	1065	8
Future Volume (vph)	93	0	93	232	0	86	30	1135	119	30	1065	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3441		1785	3575	
Flt Permitted	0.70	1.00		0.70	1.00		0.27	1.00		0.12	1.00	
Satd. Flow (perm)	1292	1566		1223	1566		491	3441		235	3575	
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)	93	0	93	232	0	86	30	1135	119	30	1065	8
RTOR Reduction (vph)	0	72	0	0	66	0	0	9	0	0	1	0
Lane Group Flow (vph)	93	21	0	232	20	0	30	1245	0	30	1072	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		D.Pm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	17.2	17.2		17.2	17.2		38.0	38.0		44.8	44.8	
Effective Green, g (s)	17.2	17.2		17.2	17.2		38.0	38.0		44.8	44.8	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.51	0.51		0.60	0.60	
Clearance Time (s)	6.0	6.0		6.0	6.0		7.0	7.0		4.0	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)	296	359		280	359		248	1743		198	2135	
v/s Ratio Prot		0.01			0.01			c0.36		0.01	c0.30	
v/s Ratio Perm	0.07			c0.19			0.06			0.08		
v/c Ratio	0.31	0.06		0.83	0.05		0.12	0.71		0.15	0.50	
Uniform Delay, d1	24.0	22.6		27.5	22.6		9.7	14.3		8.6	8.7	
Progression Factor	1.00	1.00		1.00	1.00		0.80	0.91		1.00	1.00	
Incremental Delay, d2	0.6	0.1		17.9	0.1		0.7	1.7		0.4	0.8	
Delay (s)	24.6	22.6		45.4	22.6		8.5	14.6		9.0	9.5	
Level of Service	C	C		D	C		A	B		A	A	
Approach Delay (s)		23.6			39.3			14.5			9.5	
Approach LOS		C			D			B			A	

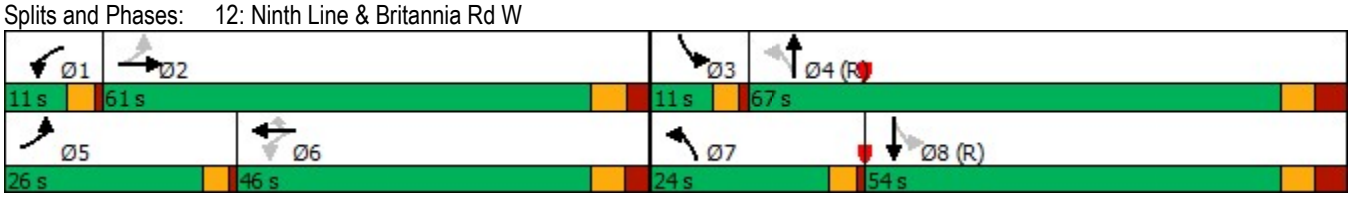
Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	227	1337	100	681	113	400	984	83	1001
Future Volume (vph)	227	1337	100	681	113	400	984	83	1001
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0
Minimum Split (s)	11.0	26.5	11.0	26.7	26.7	11.0	47.7	11.0	47.7
Total Split (s)	26.0	61.0	11.0	46.0	46.0	24.0	67.0	11.0	54.0
Total Split (%)	17.3%	40.7%	7.3%	30.7%	30.7%	16.0%	44.7%	7.3%	36.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.5	1.0	2.7	2.7	1.0	3.7	1.0	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.7	6.7	4.0	7.7	4.0	7.7
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	68.0	54.5	53.7	44.0	44.0	74.0	59.3	57.0	46.3
Actuated g/C Ratio	0.45	0.36	0.36	0.29	0.29	0.49	0.40	0.38	0.31
v/c Ratio	0.68	1.34	0.74	0.64	0.20	1.38	0.82	0.57	1.07
Control Delay	36.9	196.2	60.7	50.1	3.0	223.9	47.4	42.8	99.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	196.2	60.7	50.1	3.0	223.9	47.4	42.8	99.1
LOS	D	F	E	D	A	F	D	D	F
Approach Delay		177.8		45.3			93.3		95.3
Approach LOS		F		D			F		F

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 149 (99%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.38	
Intersection Signal Delay: 115.6	Intersection LOS: F
Intersection Capacity Utilization 129.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	1737	100	681	113	400	1138	83	1169
v/c Ratio	0.68	1.34	0.74	0.64	0.20	1.38	0.82	0.57	1.07
Control Delay	36.9	196.2	60.7	50.1	3.0	223.9	47.4	42.8	99.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	196.2	60.7	50.1	3.0	223.9	47.4	42.8	99.1
Queue Length 50th (m)	38.4	~324.6	15.7	85.9	0.0	~130.3	136.6	12.2	~185.8
Queue Length 95th (m)	56.1	#363.6	#41.5	110.4	5.8	#190.3	171.2	m20.0	#227.2
Internal Link Dist (m)		80.1		420.4			341.1		608.8
Turn Bay Length (m)	80.0		70.0		70.0	75.0		60.0	
Base Capacity (vph)	377	1295	135	1060	553	289	1383	146	1090
Starvation Cap Reductn	0	13	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	0.60	1.35	0.74	0.64	0.20	1.38	0.82	0.57	1.07

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	1337	400	100	681	113	400	984	154	83	1001	168
Future Volume (vph)	227	1337	400	100	681	113	400	984	154	83	1001	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.5		4.0	6.7	6.7	4.0	7.7		4.0	7.7	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	3516		1767	3614	1521	1767	3476		1668	3506	
Flt Permitted	0.20	1.00		0.09	1.00	1.00	0.08	1.00		0.12	1.00	
Satd. Flow (perm)	376	3516		169	3614	1521	148	3476		206	3506	
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)	227	1337	400	100	681	113	400	984	154	83	1001	168
RTOR Reduction (vph)	0	18	0	0	0	80	0	8	0	0	9	0
Lane Group Flow (vph)	227	1719	0	100	681	33	400	1130	0	83	1160	0
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	65.5	54.5		51.0	44.0	44.0	70.3	59.3		53.3	46.3	
Effective Green, g (s)	65.5	54.5		51.0	44.0	44.0	70.3	59.3		53.3	46.3	
Actuated g/C Ratio	0.44	0.36		0.34	0.29	0.29	0.47	0.40		0.36	0.31	
Clearance Time (s)	4.0	6.5		4.0	6.7	6.7	4.0	7.7		4.0	7.7	
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)	326	1277		132	1060	446	285	1374		141	1082	
v/s Ratio Prot	c0.08	c0.49		0.04	0.19		c0.19	0.32		0.03	0.33	
v/s Ratio Perm	0.22			0.22		0.02	c0.47			0.18		
v/c Ratio	0.70	1.35		0.76	0.64	0.07	1.40	0.82		0.59	1.07	
Uniform Delay, d1	30.0	47.8		40.3	46.2	38.3	49.0	40.6		35.3	51.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.94	1.05		1.31	1.09	
Incremental Delay, d2	6.3	160.9		21.7	3.0	0.3	198.7	4.9		5.3	47.1	
Delay (s)	36.3	208.6		61.9	49.1	38.6	245.0	47.5		51.6	103.6	
Level of Service	D	F		E	D	D	F	D		D	F	
Approach Delay (s)		188.7			49.2			98.9			100.2	
Approach LOS		F			D			F			F	

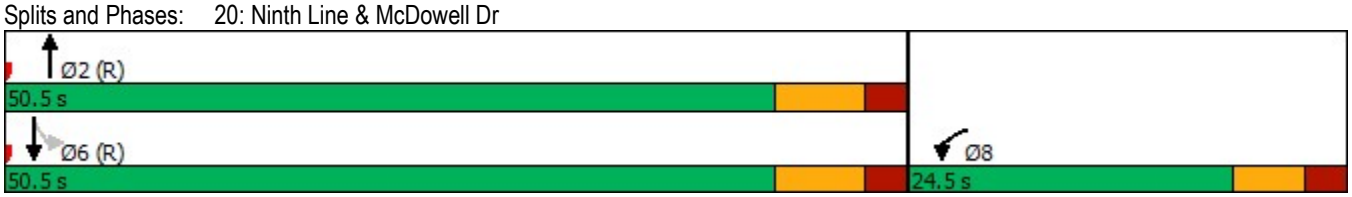
Intersection Summary			
HCM 2000 Control Delay	122.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	129.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	91	1406	26	1589
Future Volume (vph)	91	1406	26	1589
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.5	25.5	25.5	25.5
Total Split (s)	24.5	50.5	50.5	50.5
Total Split (%)	32.7%	67.3%	67.3%	67.3%
Yellow Time (s)	4.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	7.5	7.5	7.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.9	55.0	55.0	55.0
Actuated g/C Ratio	0.13	0.73	0.73	0.73
v/c Ratio	0.53	0.57	0.13	0.61
Control Delay	29.8	7.6	3.6	4.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.8	7.6	3.6	4.0
LOS	C	A	A	A
Approach Delay	29.8	7.6		4.0
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 18 (24%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Ninth Line & McDowell Dr



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	137	1487	26	1589
v/c Ratio	0.53	0.57	0.13	0.61
Control Delay	29.8	7.6	3.6	4.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.8	7.6	3.6	4.0
Queue Length 50th (m)	12.8	46.6	1.0	35.7
Queue Length 95th (m)	25.6	77.2	m1.0	m38.8
Internal Link Dist (m)	322.0	187.3		341.1
Turn Bay Length (m)			25.0	
Base Capacity (vph)	446	2591	195	2624
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.57	0.13	0.61

Intersection Summary

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

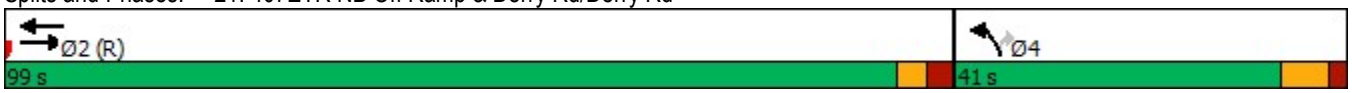
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	91	46	1406	81	26	1589
Future Volume (vph)	91	46	1406	81	26	1589
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5		7.5		7.5	7.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1757		3529		1785	3579
Flt Permitted	0.97		1.00		0.14	1.00
Satd. Flow (perm)	1757		3529		267	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	91	46	1406	81	26	1589
RTOR Reduction (vph)	28	0	4	0	0	0
Lane Group Flow (vph)	109	0	1483	0	26	1589
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	8.8		52.2		52.2	52.2
Effective Green, g (s)	8.8		52.2		52.2	52.2
Actuated g/C Ratio	0.12		0.70		0.70	0.70
Clearance Time (s)	6.5		7.5		7.5	7.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	206		2456		185	2490
v/s Ratio Prot	c0.06		0.42			c0.44
v/s Ratio Perm					0.10	
v/c Ratio	0.53		0.60		0.14	0.64
Uniform Delay, d1	31.1		6.0		3.8	6.2
Progression Factor	1.00		1.00		0.63	0.58
Incremental Delay, d2	2.4		1.1		0.1	0.1
Delay (s)	33.6		7.1		2.6	3.7
Level of Service	C		A		A	A
Approach Delay (s)	33.6		7.1			3.7
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1769	1173	54	242
Future Volume (vph)	1769	1173	54	242
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	99.0	99.0	41.0	41.0
Total Split (%)	70.7%	70.7%	29.3%	29.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	93.0	93.0	34.0	34.0
Actuated g/C Ratio	0.66	0.66	0.24	0.24
v/c Ratio	0.74	0.50	0.08	0.62
Control Delay	18.1	12.8	41.4	49.3
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	18.4	12.8	41.4	49.3
LOS	B	B	D	D
Approach Delay	18.4	12.8	47.8	
Approach LOS	B	B	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1769	1173	54	242
v/c Ratio	0.74	0.50	0.08	0.62
Control Delay	18.1	12.8	41.4	49.3
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	18.4	12.8	41.4	49.3
Queue Length 50th (m)	146.8	73.8	5.5	48.7
Queue Length 95th (m)	171.5	88.1	10.8	75.8
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2377	2331	712	388
Starvation Cap Reductn	177	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.50	0.08	0.62

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1769	0	0	1173	54	242
Future Volume (vph)	1769	0	0	1173	54	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1769	0	0	1173	54	242
RTOR Reduction (vph)	0	0	0	0	0	23
Lane Group Flow (vph)	1769	0	0	1173	54	219
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	93.0			93.0	34.0	34.0
Effective Green, g (s)	93.0			93.0	34.0	34.0
Actuated g/C Ratio	0.66			0.66	0.24	0.24
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2377			2331	712	365
v/s Ratio Prot	c0.49			0.33	0.02	
v/s Ratio Perm						c0.15
v/c Ratio	0.74			0.50	0.08	0.60
Uniform Delay, d1	15.6			11.9	40.9	47.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	2.2			0.8	0.2	7.1
Delay (s)	17.8			12.6	41.1	54.1
Level of Service	B			B	D	D
Approach Delay (s)	17.8			12.6	51.7	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	208	183	1360	142	1522
Future Volume (vph)	208	183	1360	142	1522
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	25.5	25.5	33.5	11.0	44.5
Total Split (%)	36.4%	36.4%	47.9%	15.7%	63.6%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.5	4.0	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.5	13.5	33.1	46.0	42.5
Actuated g/C Ratio	0.19	0.19	0.47	0.66	0.61
v/c Ratio	0.62	0.42	0.94	0.50	0.70
Control Delay	33.4	7.0	33.4	13.8	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	7.0	33.4	13.8	12.5
LOS	C	A	C	B	B
Approach Delay	21.1		33.4		12.6
Approach LOS	C		C		B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	208	183	1553	142	1522
v/c Ratio	0.62	0.42	0.94	0.50	0.70
Control Delay	33.4	7.0	33.4	13.8	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	7.0	33.4	13.8	12.5
Queue Length 50th (m)	23.2	0.0	~94.9	5.5	58.3
Queue Length 95th (m)	37.3	12.1	#158.1	18.5	97.0
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	474	538	1658	283	2173
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.34	0.94	0.50	0.70

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.

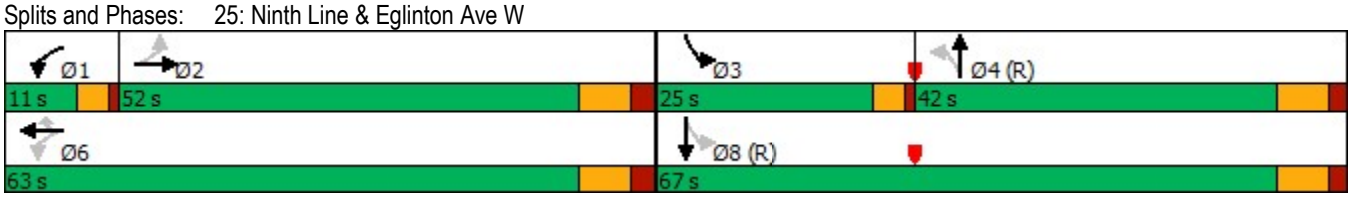
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	208	183	1360	193	142	1522
Future Volume (vph)	208	183	1360	193	142	1522
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.5		4.0	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1748	1493	3478		1653	3579
Flt Permitted	0.95	1.00	1.00		0.11	1.00
Satd. Flow (perm)	1748	1493	3478		192	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	208	183	1360	193	142	1522
RTOR Reduction (vph)	0	148	13	0	0	0
Lane Group Flow (vph)	208	35	1540	0	142	1522
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	13.5	13.5	32.3		42.5	42.5
Effective Green, g (s)	13.5	13.5	32.3		42.5	42.5
Actuated g/C Ratio	0.19	0.19	0.46		0.61	0.61
Clearance Time (s)	6.5	6.5	7.5		4.0	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	337	287	1604		245	2172
v/s Ratio Prot			c0.44		0.05	c0.43
v/s Ratio Perm	c0.12	0.02			0.30	
v/c Ratio	0.62	0.12	0.96		0.58	0.70
Uniform Delay, d1	25.9	23.4	18.2		12.6	9.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.3	0.2	14.8		3.3	1.9
Delay (s)	29.2	23.5	33.0		15.9	11.3
Level of Service	C	C	C		B	B
Approach Delay (s)	26.6		33.0			11.7
Approach LOS	C		C			B

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	38	612	99	264	256	28	856	400	1316
Future Volume (vph)	38	612	99	264	256	28	856	400	1316
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2	1	6			4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	4	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.0	32.5	32.5	40.0	40.0	11.0	40.0
Total Split (s)	52.0	52.0	11.0	63.0	63.0	42.0	42.0	25.0	67.0
Total Split (%)	40.0%	40.0%	8.5%	48.5%	48.5%	32.3%	32.3%	19.2%	51.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	44.5	44.5	59.0	55.5	55.5	35.0	35.0	63.0	60.0
Actuated g/C Ratio	0.34	0.34	0.45	0.43	0.43	0.27	0.27	0.48	0.46
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.1	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.1	29.3
LOS	C	F	D	C	A	F	F	F	C
Approach Delay		122.8		19.4			99.8		54.1
Approach LOS		F		B			F		D

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 13 (10%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 72.9	Intersection LOS: E
Intersection Capacity Utilization 114.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	735	99	264	256	28	1006	400	1386
v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84
Control Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.1	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	127.6	41.3	26.4	3.9	155.2	98.2	140.1	29.3
Queue Length 50th (m)	6.1	~204.5	13.3	40.9	0.0	6.2	~138.3	~101.5	111.5
Queue Length 95th (m)	13.8	#273.2	#29.2	60.5	14.3	#24.4	#176.8	m#149.4	139.6
Internal Link Dist (m)		373.3		388.7			291.0		253.8
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	358	633	153	796	778	34	930	337	1642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	1.16	0.65	0.33	0.33	0.82	1.08	1.19	0.84

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Future Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1834		1733	1865	1479	1069	3416		1716	3555	
Flt Permitted	0.60	1.00		0.08	1.00	1.00	0.11	1.00		0.10	1.00	
Satd. Flow (perm)	1047	1834		150	1865	1479	129	3416		185	3555	
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)	38	612	123	99	264	256	28	856	150	400	1316	70
RTOR Reduction (vph)	0	5	0	0	0	147	0	11	0	0	3	0
Lane Group Flow (vph)	38	730	0	99	264	109	28	995	0	400	1383	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Effective Green, g (s)	44.5	44.5		55.5	55.5	55.5	35.0	35.0		60.0	60.0	
Actuated g/C Ratio	0.34	0.34		0.43	0.43	0.43	0.27	0.27		0.46	0.46	
Clearance Time (s)	7.5	7.5		4.0	7.5	7.5	7.0	7.0		4.0	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)	358	627		149	796	631	34	919		332	1640	
v/s Ratio Prot		c0.40		c0.04	0.14			0.29		c0.19	0.39	
v/s Ratio Perm	0.04			0.25		0.07	0.22			c0.36		
v/c Ratio	0.11	1.16		0.66	0.33	0.17	0.82	1.08		1.20	0.84	
Uniform Delay, d1	29.2	42.8		30.7	24.9	23.1	44.6	47.5		40.7	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.20	0.83	
Incremental Delay, d2	0.6	90.4		10.6	1.1	0.6	105.9	54.7		108.5	3.4	
Delay (s)	29.8	133.1		41.3	26.0	23.6	150.5	102.2		157.4	29.0	
Level of Service	C	F		D	C	C	F	F		F	C	
Approach Delay (s)		128.0			27.5			103.5			57.8	
Approach LOS		F			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	77.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	48	1373	65	1639
Future Volume (vph)	48	1373	65	1639
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	24.0	24.0	24.0	24.0
Total Split (s)	24.0	41.0	41.0	41.0
Total Split (%)	36.9%	63.1%	63.1%	63.1%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.9	46.6	46.6	46.6
Actuated g/C Ratio	0.15	0.72	0.72	0.72
v/c Ratio	0.53	0.58	0.36	0.64
Control Delay	25.5	4.3	13.7	8.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	4.3	13.7	8.5
LOS	C	A	B	A
Approach Delay	25.5	4.3		8.7
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 16 (25%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 71.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	1448	65	1639
v/c Ratio	0.53	0.58	0.36	0.64
Control Delay	25.5	4.3	13.7	8.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	4.3	13.7	8.5
Queue Length 50th (m)	12.2	22.5	2.7	49.4
Queue Length 95th (m)	24.4	26.8	14.0	86.8
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	497	2515	183	2565
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.58	0.36	0.64

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	106	1373	75	65	1639
Future Volume (vph)	48	106	1373	75	65	1639
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.0		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1704		3506		1684	3579
Flt Permitted	0.98		1.00		0.14	1.00
Satd. Flow (perm)	1704		3506		256	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	106	1373	75	65	1639
RTOR Reduction (vph)	30	0	4	0	0	0
Lane Group Flow (vph)	124	0	1444	0	65	1639
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	8.8		44.2		44.2	44.2
Effective Green, g (s)	8.8		44.2		44.2	44.2
Actuated g/C Ratio	0.14		0.68		0.68	0.68
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	230		2384		174	2433
v/s Ratio Prot	c0.07		0.41			c0.46
v/s Ratio Perm					0.25	
v/c Ratio	0.54		0.61		0.37	0.67
Uniform Delay, d1	26.2		5.7		4.5	6.1
Progression Factor	1.00		0.55		1.00	1.00
Incremental Delay, d2	2.4		1.0		6.0	1.5
Delay (s)	28.6		4.1		10.5	7.7
Level of Service	C		A		B	A
Approach Delay (s)	28.6		4.1			7.8
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	145	82	1115	110	1685
Future Volume (vph)	145	82	1115	110	1685
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	23.0	23.0	31.0	11.0	42.0
Total Split (%)	35.4%	35.4%	47.7%	16.9%	64.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.9	10.9	36.4	46.5	45.7
Actuated g/C Ratio	0.17	0.17	0.56	0.72	0.70
v/c Ratio	0.49	0.24	0.62	0.30	0.67
Control Delay	29.8	7.9	20.0	8.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	7.9	20.0	8.3	5.3
LOS	C	A	C	A	A
Approach Delay	21.9		20.0		5.5
Approach LOS	C		C		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 55 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	145	82	1192	110	1685
v/c Ratio	0.49	0.24	0.62	0.30	0.67
Control Delay	29.8	7.9	20.0	8.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	7.9	20.0	8.3	5.3
Queue Length 50th (m)	14.9	0.0	102.6	2.1	22.9
Queue Length 95th (m)	26.7	8.4	#126.5	m6.8	38.6
Internal Link Dist (m)	358.4		274.9		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	448	466	1920	364	2517
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.18	0.62	0.30	0.67

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.

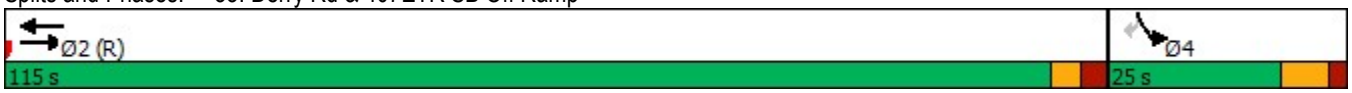
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	145	82	1115	77	110	1685
Future Volume (vph)	145	82	1115	77	110	1685
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3416		1785	3579
Flt Permitted	0.95	1.00	1.00		0.14	1.00
Satd. Flow (perm)	1765	1597	3416		264	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	82	1115	77	110	1685
RTOR Reduction (vph)	0	70	6	0	0	0
Lane Group Flow (vph)	145	12	1186	0	110	1685
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	9.3	9.3	33.1		43.2	43.2
Effective Green, g (s)	9.3	9.3	33.1		43.2	43.2
Actuated g/C Ratio	0.14	0.14	0.51		0.66	0.66
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	252	228	1739		318	2378
v/s Ratio Prot			0.35		0.03	c0.47
v/s Ratio Perm	c0.08	0.01			0.20	
v/c Ratio	0.58	0.05	0.68		0.35	0.71
Uniform Delay, d1	26.0	24.0	12.0		6.2	6.9
Progression Factor	1.00	1.00	1.39		1.49	0.51
Incremental Delay, d2	3.2	0.1	2.0		0.5	1.5
Delay (s)	29.2	24.1	18.6		9.8	5.0
Level of Service	C	C	B		A	A
Approach Delay (s)	27.4		18.6			5.3
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	2270	1010	54	46
Future Volume (vph)	2270	1010	54	46
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	115.0	115.0	25.0	25.0
Total Split (%)	82.1%	82.1%	17.9%	17.9%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	122.9	122.9	8.1	8.1
Actuated g/C Ratio	0.88	0.88	0.06	0.06
v/c Ratio	0.72	0.33	0.30	0.39
Control Delay	5.5	2.3	67.0	26.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	2.3	67.0	26.0
LOS	A	A	E	C
Approach Delay	5.5	2.3	48.1	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 79.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2270	1010	54	46
v/c Ratio	0.72	0.33	0.30	0.39
Control Delay	5.5	2.3	67.0	26.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	2.3	67.0	26.0
Queue Length 50th (m)	92.5	21.5	6.9	0.0
Queue Length 95th (m)	126.1	30.0	13.3	11.8
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	3171	3080	404	208
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.33	0.13	0.22

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2270	1010	0	54	46
Future Volume (vph)	0	2270	1010	0	54	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2270	1010	0	54	46
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	0	2270	1010	0	54	2
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		120.3	120.3		6.7	6.7
Effective Green, g (s)		120.3	120.3		6.7	6.7
Actuated g/C Ratio		0.86	0.86		0.05	0.05
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3105	3016		150	62
v/s Ratio Prot		c0.63	0.29		c0.02	
v/s Ratio Perm						0.00
v/c Ratio		0.73	0.33		0.36	0.04
Uniform Delay, d1		3.7	1.9		64.6	63.6
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.6	0.3		1.5	0.2
Delay (s)		5.3	2.2		66.1	63.8
Level of Service		A	A		E	E
Approach Delay (s)		5.3	2.2		65.0	
Approach LOS		A	A		E	

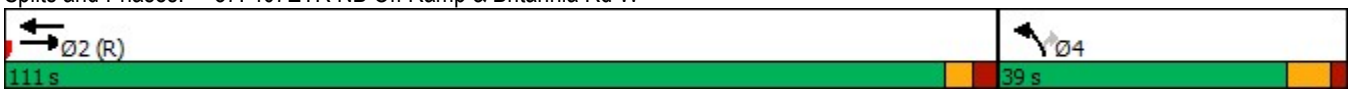
Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1807	1063	69	208
Future Volume (vph)	1807	1063	69	208
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	111.0	111.0	39.0	39.0
Total Split (%)	74.0%	74.0%	26.0%	26.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	114.7	114.7	22.3	22.3
Actuated g/C Ratio	0.76	0.76	0.15	0.15
v/c Ratio	0.65	0.39	0.29	0.80
Control Delay	10.5	6.9	57.8	72.7
Queue Delay	0.4	0.3	0.0	0.0
Total Delay	11.0	7.3	57.8	72.7
LOS	B	A	E	E
Approach Delay	11.0	7.3	69.0	
Approach LOS	B	A	E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1807	1063	69	208
v/c Ratio	0.65	0.39	0.29	0.80
Control Delay	10.5	6.9	57.8	72.7
Queue Delay	0.4	0.3	0.0	0.0
Total Delay	11.0	7.3	57.8	72.7
Queue Length 50th (m)	108.8	45.5	17.0	47.3
Queue Length 95th (m)	162.1	69.6	29.0	69.5
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2762	2735	343	360
Starvation Cap Reductn	439	972	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	0.60	0.20	0.58

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1807	0	0	1063	69	208
Future Volume (vph)	1807	0	0	1063	69	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1807	0	0	1063	69	208
RTOR Reduction (vph)	0	0	0	0	0	28
Lane Group Flow (vph)	1807	0	0	1063	69	180
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	114.7			114.7	22.3	22.3
Effective Green, g (s)	114.7			114.7	22.3	22.3
Actuated g/C Ratio	0.76			0.76	0.15	0.15
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2763			2736	239	232
v/s Ratio Prot	c0.50			0.30	0.04	
v/s Ratio Perm						c0.11
v/c Ratio	0.65			0.39	0.29	0.78
Uniform Delay, d1	8.3			5.9	56.8	61.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.2			0.4	0.7	14.9
Delay (s)	9.5			6.3	57.5	76.3
Level of Service	A			A	E	E
Approach Delay (s)	9.5			6.3	71.6	
Approach LOS	A			A	E	

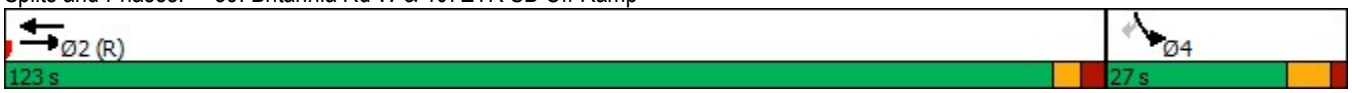
Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1993	996	70	63
Future Volume (vph)	1993	996	70	63
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	123.0	123.0	27.0	27.0
Total Split (%)	82.0%	82.0%	18.0%	18.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	125.4	125.4	11.6	11.6
Actuated g/C Ratio	0.84	0.84	0.08	0.08
v/c Ratio	0.66	0.33	0.54	0.42
Control Delay	6.1	3.3	81.0	22.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.1	3.3	81.0	22.2
LOS	A	A	F	C
Approach Delay	6.1	3.3	53.1	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1993	996	70	63
v/c Ratio	0.66	0.33	0.54	0.42
Control Delay	6.1	3.3	81.0	22.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.1	3.3	81.0	22.2
Queue Length 50th (m)	84.5	26.2	18.8	0.0
Queue Length 95th (m)	121.6	38.9	33.0	13.2
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	3021	2992	224	215
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.33	0.31	0.29

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1993	996	0	70	63
Future Volume (vph)	0	1993	996	0	70	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1993	996	0	70	63
RTOR Reduction (vph)	0	0	0	0	0	58
Lane Group Flow (vph)	0	1993	996	0	70	5
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		125.4	125.4		11.6	11.6
Effective Green, g (s)		125.4	125.4		11.6	11.6
Actuated g/C Ratio		0.84	0.84		0.08	0.08
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3021	2992		130	93
v/s Ratio Prot		c0.55	0.28		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.66	0.33		0.54	0.05
Uniform Delay, d1		4.5	2.8		66.6	64.1
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.1	0.3		4.2	0.2
Delay (s)		5.6	3.1		70.9	64.3
Level of Service		A	A		E	E
Approach Delay (s)		5.6	3.1		67.8	
Approach LOS		A	A		E	

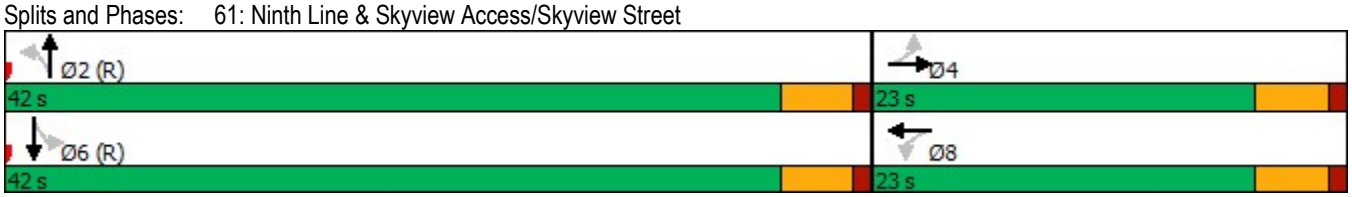
Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	116	5	5	5	100	1081	2	1718
Future Volume (vph)	116	5	5	5	100	1081	2	1718
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0	23.0	23.0	42.0	42.0	42.0	42.0
Total Split (%)	35.4%	35.4%	35.4%	35.4%	64.6%	64.6%	64.6%	64.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	15.4	15.4	15.4	15.4	40.6	40.6	40.6	40.6
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.62	0.62	0.62	0.62
v/c Ratio	0.36	0.75	0.03	0.04	0.88	0.50	0.01	0.81
Control Delay	22.8	33.7	17.6	11.4	73.5	16.6	4.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.7	17.6	11.4	73.5	16.6	4.0	8.2
LOS	C	C	B	B	E	B	A	A
Approach Delay		30.6		12.8		21.4		8.2
Approach LOS		C		B		C		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 61: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	290	5	17	100	1083	2	1760
v/c Ratio	0.36	0.75	0.03	0.04	0.88	0.50	0.01	0.81
Control Delay	22.8	33.7	17.6	11.4	73.5	16.6	4.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.7	17.6	11.4	73.5	16.6	4.0	8.2
Queue Length 50th (m)	10.5	27.3	0.4	0.4	19.6	92.6	0.0	20.2
Queue Length 95th (m)	21.0	47.0	2.4	3.9	m#24.3	m96.3	m0.1	#34.7
Internal Link Dist (m)		133.4		125.1		253.8		161.4
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	391	460	205	477	113	2186	252	2179
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	0.30	0.63	0.02	0.04	0.88	0.50	0.01	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	5	285	5	5	12	100	1081	2	2	1718	42
Future Volume (vph)	116	5	285	5	5	12	100	1081	2	2	1718	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1571		1750	1647		1750	3499		1750	3487	
Flt Permitted	0.75	1.00		0.39	1.00		0.10	1.00		0.22	1.00	
Satd. Flow (perm)	1375	1571		723	1647		181	3499		405	3487	
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)	116	5	285	5	5	12	100	1081	2	2	1718	42
RTOR Reduction (vph)	0	14	0	0	9	0	0	0	0	0	2	0
Lane Group Flow (vph)	116	276	0	5	8	0	100	1083	0	2	1758	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.4	15.4		15.4	15.4		40.6	40.6		40.6	40.6	
Effective Green, g (s)	15.4	15.4		15.4	15.4		40.6	40.6		40.6	40.6	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.62	0.62		0.62	0.62	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	325	372		171	390		113	2185		252	2178	
v/s Ratio Prot		c0.18			0.00			0.31			0.50	
v/s Ratio Perm	0.08			0.01			c0.55			0.00		
v/c Ratio	0.36	0.74		0.03	0.02		0.88	0.50		0.01	0.81	
Uniform Delay, d1	20.7	23.0		19.1	19.0		10.2	6.6		4.6	9.2	
Progression Factor	1.00	1.00		1.00	1.00		3.11	2.26		0.71	0.46	
Incremental Delay, d2	0.7	7.7		0.1	0.0		35.4	0.4		0.0	2.6	
Delay (s)	21.3	30.7		19.1	19.0		67.3	15.4		3.3	6.8	
Level of Service	C	C		B	B		E	B		A	A	
Approach Delay (s)		28.0			19.1			19.8			6.8	
Approach LOS		C			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	0	42	46	0	68	10	1240	36	30	1116	39
Future Volume (Veh/h)	29	0	42	46	0	68	10	1240	36	30	1116	39
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)	29	0	42	46	0	68	10	1240	36	30	1116	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.74	0.74		0.74	0.74	0.74				0.74		
vC, conflicting volume	1904	2492	578	1938	2493	638	1155			1276		
vC1, stage 1 conf vol	1196	1196		1278	1278							
vC2, stage 2 conf vol	708	1296		660	1215							
vCu, unblocked vol	1520	2314	578	1566	2316	0	1155			673		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	100	91	80	100	92	98			96		
cM capacity (veh/h)	179	181	459	228	183	808	601			672		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	42	114	10	827	449	30	744	411
Volume Left	29	0	46	10	0	0	30	0	0
Volume Right	0	42	68	0	0	36	0	0	39
cSH	179	459	399	601	1700	1700	672	1700	1700
Volume to Capacity	0.16	0.09	0.29	0.02	0.49	0.26	0.04	0.44	0.24
Queue Length 95th (m)	3.9	2.1	8.1	0.4	0.0	0.0	1.0	0.0	0.0
Control Delay (s)	29.0	13.6	17.6	11.1	0.0	0.0	10.6	0.0	0.0
Lane LOS	D	B	C	B			B		
Approach Delay (s)	19.9		17.6	0.1			0.3		
Approach LOS	C		C						

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	38	11	1161	1821	6
Future Volume (Veh/h)	21	38	11	1161	1821	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)	21	38	11	1161	1821	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				185	299	
pX, platoon unblocked	0.71	0.63	0.63			
vC, conflicting volume	2426	914	1827			
vC1, stage 1 conf vol	1824					
vC2, stage 2 conf vol	602					
vCu, unblocked vol	1157	0	1136			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	94	97			
cM capacity (veh/h)	166	682	384			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	21	38	11	580	580	1214	613
Volume Left	21	0	11	0	0	0	0
Volume Right	0	38	0	0	0	0	6
cSH	166	682	384	1700	1700	1700	1700
Volume to Capacity	0.13	0.06	0.03	0.34	0.34	0.71	0.36
Queue Length 95th (m)	3.0	1.2	0.6	0.0	0.0	0.0	0.0
Control Delay (s)	29.9	10.6	14.6	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	17.4		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	8	2	1557	1073	18
Future Volume (Veh/h)	20	8	2	1557	1073	18
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)	20	8	2	1557	1073	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				398	201	
pX, platoon unblocked	0.70	0.88	0.88			
vC, conflicting volume	1864	546	1091			
vC1, stage 1 conf vol	1082					
vC2, stage 2 conf vol	782					
vCu, unblocked vol	637	221	839			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	334	691	699			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	20	8	521	1038	715	376
Volume Left	20	0	2	0	0	0
Volume Right	0	8	0	0	0	18
cSH	334	691	699	1700	1700	1700
Volume to Capacity	0.06	0.01	0.00	0.61	0.42	0.22
Queue Length 95th (m)	1.3	0.2	0.1	0.0	0.0	0.0
Control Delay (s)	16.4	10.3	0.1	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	14.7		0.0		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	15	9	1401	1079	16
Future Volume (Veh/h)	42	15	9	1401	1079	16
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)	42	15	9	1401	1079	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					397	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1806	548	1095			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1672	273	882			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	45	98	99			
cM capacity (veh/h)	77	652	686			

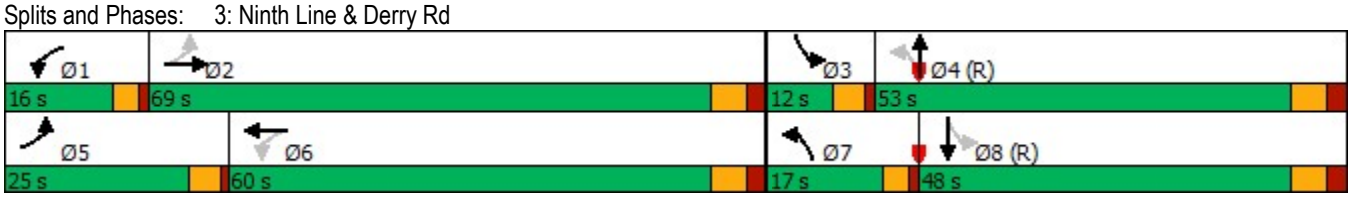
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	15	9	700	700	719	376
Volume Left	42	0	9	0	0	0	0
Volume Right	0	15	0	0	0	0	16
cSH	77	652	686	1700	1700	1700	1700
Volume to Capacity	0.55	0.02	0.01	0.41	0.41	0.42	0.22
Queue Length 95th (m)	16.4	0.5	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	97.7	10.7	10.3	0.0	0.0	0.0	0.0
Lane LOS	F	B	B				
Approach Delay (s)	74.8		0.1			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	367	722	165	1608	246	831	56	761
Future Volume (vph)	367	722	165	1608	246	831	56	761
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	7	4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	7	4	3	8
Switch Phase								
Minimum Initial (s)	7.0	8.0	7.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)	11.5	30.1	11.0	30.1	11.0	29.4	11.5	29.4
Total Split (s)	25.0	69.0	16.0	60.0	17.0	53.0	12.0	48.0
Total Split (%)	16.7%	46.0%	10.7%	40.0%	11.3%	35.3%	8.0%	32.0%
Yellow Time (s)	3.5	4.0	3.0	4.0	3.0	4.0	3.5	4.0
All-Red Time (s)	1.0	2.1	1.0	2.1	1.0	2.4	1.0	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.1	4.0	6.1	4.0	6.4	4.5	6.4
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	Max	None	Max	None	C-Max	None	C-Max
Act Effct Green (s)	80.5	63.5	67.4	53.9	61.0	49.0	50.9	41.6
Actuated g/C Ratio	0.54	0.42	0.45	0.36	0.41	0.33	0.34	0.28
v/c Ratio	1.32	0.75	0.75	1.31	1.21	0.84	0.41	1.17
Control Delay	204.1	37.3	44.5	185.7	169.0	50.8	37.3	130.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	204.1	37.3	44.5	185.7	169.0	50.8	37.3	130.6
LOS	F	D	D	F	F	D	D	F
Approach Delay		78.4		172.9		74.7		126.3
Approach LOS		E		F		E		F

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 32 (21%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.32	
Intersection Signal Delay: 117.7	Intersection LOS: F
Intersection Capacity Utilization 131.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	367	1122	165	1653	246	971	56	1161
v/c Ratio	1.32	0.75	0.75	1.31	1.21	0.84	0.41	1.17
Control Delay	204.1	37.3	44.5	185.7	169.0	50.8	37.3	130.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	204.1	37.3	44.5	185.7	169.0	50.8	37.3	130.6
Queue Length 50th (m)	~115.9	126.7	22.3	~307.4	~63.8	138.5	9.4	~191.9
Queue Length 95th (m)	#174.6	151.5	#47.7	#346.8	#120.8	164.3	18.0	#231.6
Internal Link Dist (m)		119.7		244.5		681.0		237.0
Turn Bay Length (m)	75.0		80.0		130.0		95.0	
Base Capacity (vph)	278	1503	226	1258	203	1162	138	995
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	1.32	0.75	0.73	1.31	1.21	0.84	0.41	1.17

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
Future Volume (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.5	6.1		4.0	6.1		4.0	6.4		4.5	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1684	3433		1733	3497		1750	3531		1716	3427	
Flt Permitted	0.07	1.00		0.13	1.00		0.09	1.00		0.10	1.00	
Satd. Flow (perm)	121	3433		235	3497		162	3531		181	3427	
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)	367	722	400	165	1608	45	246	831	140	56	761	400
RTOR Reduction (vph)	0	50	0	0	1	0	0	9	0	0	46	0
Lane Group Flow (vph)	367	1072	0	165	1652	0	246	962	0	56	1115	0
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	78.9	63.5		65.3	53.9		58.6	48.1		47.6	41.6	
Effective Green, g (s)	78.9	63.5		65.3	53.9		58.6	48.1		47.6	41.6	
Actuated g/C Ratio	0.53	0.42		0.44	0.36		0.39	0.32		0.32	0.28	
Clearance Time (s)	4.5	6.1		4.0	6.1		4.0	6.4		4.5	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	277	1453		216	1256		200	1132		118	950	
v/s Ratio Prot	c0.18	0.31		0.06	0.47		c0.11	0.27		0.02	0.33	
v/s Ratio Perm	c0.51			0.27			c0.37			0.13		
v/c Ratio	1.32	0.74		0.76	1.32		1.23	0.85		0.47	1.17	
Uniform Delay, d1	50.5	36.3		30.1	48.1		43.9	47.6		38.9	54.2	
Progression Factor	1.00	1.00		1.00	1.00		1.24	0.94		1.00	1.00	
Incremental Delay, d2	169.1	3.4		14.8	147.5		136.3	7.3		3.0	89.6	
Delay (s)	219.6	39.7		44.8	195.6		190.7	52.1		41.9	143.8	
Level of Service	F	D		D	F		F	D		D	F	
Approach Delay (s)		84.0			181.9			80.1			139.1	
Approach LOS		F			F			F			F	

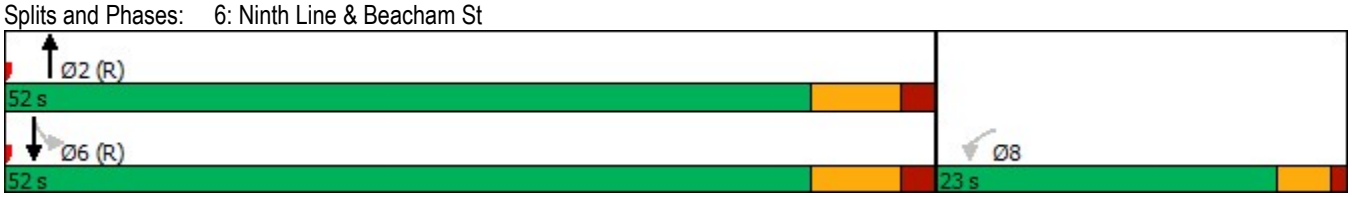
Intersection Summary			
HCM 2000 Control Delay	125.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	131	1082	81	1357
Future Volume (vph)	131	1082	81	1357
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	52.0	52.0	52.0
Total Split (%)	30.7%	69.3%	69.3%	69.3%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.7	51.3	51.3	51.3
Actuated g/C Ratio	0.17	0.68	0.68	0.68
v/c Ratio	0.64	0.49	0.30	0.56
Control Delay	31.9	4.5	6.3	5.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.9	4.5	6.3	5.6
LOS	C	A	A	A
Approach Delay	31.9	4.5		5.6
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 62 (83%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 7.1	Intersection LOS: A
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	1192	81	1357
v/c Ratio	0.64	0.49	0.30	0.56
Control Delay	31.9	4.5	6.3	5.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.9	4.5	6.3	5.6
Queue Length 50th (m)	20.9	9.2	4.4	40.3
Queue Length 95th (m)	36.3	13.8	m5.4	m46.2
Internal Link Dist (m)	168.5	178.7		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	473	2420	270	2423
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.49	0.30	0.56

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	131	80	1082	110	81	1357
Future Volume (vph)	131	80	1082	110	81	1357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1754		3529		1785	3544
Flt Permitted	0.97		1.00		0.21	1.00
Satd. Flow (perm)	1754		3529		395	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	80	1082	110	81	1357
RTOR Reduction (vph)	32	0	8	0	0	0
Lane Group Flow (vph)	179	0	1184	0	81	1357
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.7		51.3		51.3	51.3
Effective Green, g (s)	12.7		51.3		51.3	51.3
Actuated g/C Ratio	0.17		0.68		0.68	0.68
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	297		2413		270	2424
v/s Ratio Prot			0.34			c0.38
v/s Ratio Perm	c0.10				0.20	
v/c Ratio	0.60		0.49		0.30	0.56
Uniform Delay, d1	28.8		5.6		4.7	6.1
Progression Factor	1.00		0.63		0.85	0.78
Incremental Delay, d2	3.4		0.6		1.1	0.4
Delay (s)	32.2		4.2		5.1	5.1
Level of Service	C		A		A	A
Approach Delay (s)	32.2		4.2			5.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	79	8	147	13	52	1059	157	1404
Future Volume (vph)	79	8	147	13	52	1059	157	1404
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		6		2
Permitted Phases	4		8		6		2	
Detector Phase	4	4	8	8	6	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	24.5	24.5	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	50.0	50.0	50.0	50.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.4	13.4	13.4	13.4	48.1	48.1	48.1	48.1
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.64	0.64	0.64	0.64
v/c Ratio	0.35	0.13	0.62	0.33	0.34	0.52	0.64	0.64
Control Delay	30.0	11.7	39.1	10.9	15.3	8.7	17.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	11.7	39.1	10.9	15.3	8.7	17.3	4.8
LOS	C	B	D	B	B	A	B	A
Approach Delay		23.8		26.5		9.0		6.0
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 23 (31%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	79	40	147	119	52	1169	157	1457
v/c Ratio	0.35	0.13	0.62	0.33	0.34	0.52	0.64	0.64
Control Delay	30.0	11.7	39.1	10.9	15.3	8.7	17.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	11.7	39.1	10.9	15.3	8.7	17.3	4.8
Queue Length 50th (m)	9.1	0.9	17.9	2.8	2.7	36.6	7.5	29.1
Queue Length 95th (m)	18.3	7.1	31.3	13.3	12.2	60.8	#36.2	25.8
Internal Link Dist (m)		131.2		392.7		51.3		372.4
Turn Bay Length (m)			25.0		20.0		80.0	
Base Capacity (vph)	309	423	328	467	155	2267	244	2286
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	0.26	0.09	0.45	0.25	0.34	0.52	0.64	0.64

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	8	32	147	13	106	52	1059	110	157	1404	53
Future Volume (vph)	79	8	32	147	13	106	52	1059	110	157	1404	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		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	0.95	
Frt	1.00	0.88		1.00	0.87		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1621		1733	1610		1750	3522		1750	3559	
Flt Permitted	0.68	1.00		0.73	1.00		0.13	1.00		0.21	1.00	
Satd. Flow (perm)	1254	1621		1333	1610		244	3522		381	3559	
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)	79	8	32	147	13	106	52	1059	110	157	1404	53
RTOR Reduction (vph)	0	26	0	0	77	0	0	9	0	0	3	0
Lane Group Flow (vph)	79	14	0	147	42	0	52	1160	0	157	1454	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	13.4	13.4		13.4	13.4		48.1	48.1		48.1	48.1	
Effective Green, g (s)	13.4	13.4		13.4	13.4		48.1	48.1		48.1	48.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.64	0.64		0.64	0.64	
Clearance Time (s)	6.5	6.5		6.5	6.5		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)	224	289		238	287		156	2258		244	2282	
v/s Ratio Prot		0.01			0.03			0.33			0.41	
v/s Ratio Perm	0.06			c0.11			0.21			c0.41		
v/c Ratio	0.35	0.05		0.62	0.15		0.33	0.51		0.64	0.64	
Uniform Delay, d1	27.0	25.5		28.4	26.0		6.1	7.2		8.2	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.48	0.41	
Incremental Delay, d2	1.0	0.1		4.7	0.2		5.7	0.8		11.0	1.2	
Delay (s)	28.0	25.6		33.1	26.2		11.8	8.0		15.0	4.6	
Level of Service	C	C		C	C		B	A		B	A	
Approach Delay (s)		27.2			30.0			8.2			5.6	
Approach LOS		C			C			A			A	

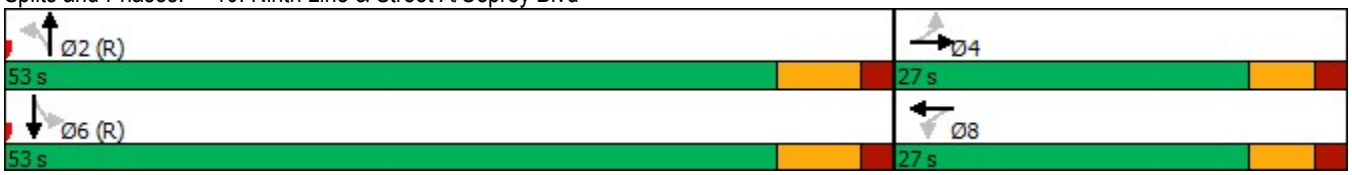
Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	0	270	0	92	1305	45	1308
Future Volume (vph)	55	0	270	0	92	1305	45	1308
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	23.0	23.0	24.0	24.0	23.0	23.0	23.0	23.0
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	19.6	19.6	19.6	19.6	47.4	47.4	47.4	47.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.59	0.59	0.59	0.59
v/c Ratio	0.17	0.13	0.87	0.08	0.58	0.73	0.38	0.63
Control Delay	24.4	7.8	57.4	3.6	29.9	14.5	20.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	7.8	57.4	3.6	29.9	14.5	20.7	12.6
LOS	C	A	E	A	C	B	C	B
Approach Delay		16.1		51.7		15.4		12.9
Approach LOS		B		D		B		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	55	270	32	92	1488	45	1332
v/c Ratio	0.17	0.13	0.87	0.08	0.58	0.73	0.38	0.63
Control Delay	24.4	7.8	57.4	3.6	29.9	14.5	20.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	7.8	57.4	3.6	29.9	14.5	20.7	12.6
Queue Length 50th (m)	5.9	0.0	35.4	0.0	7.6	73.5	3.2	60.7
Queue Length 95th (m)	13.9	7.3	#70.9	3.2	#29.8	97.3	12.3	79.3
Internal Link Dist (m)		114.7		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	355	451	332	451	159	2040	120	2115
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.12	0.81	0.07	0.58	0.73	0.38	0.63

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	55	270	0	32	92	1305	183	45	1308	24
Future Volume (vph)	55	0	55	270	0	32	92	1305	183	45	1308	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		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	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3421		1785	3569	
Flt Permitted	0.74	1.00		0.72	1.00		0.15	1.00		0.11	1.00	
Satd. Flow (perm)	1356	1566		1266	1566		268	3421		204	3569	
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	0	55	270	0	32	92	1305	183	45	1308	24
RTOR Reduction (vph)	0	42	0	0	24	0	0	13	0	0	2	0
Lane Group Flow (vph)	55	13	0	270	8	0	92	1475	0	45	1330	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.6	19.6		19.6	19.6		47.4	47.4		47.4	47.4	
Effective Green, g (s)	19.6	19.6		19.6	19.6		47.4	47.4		47.4	47.4	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.59	0.59		0.59	0.59	
Clearance Time (s)	6.0	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	3.0	
Lane Grp Cap (vph)	332	383		310	383		158	2026		120	2114	
v/s Ratio Prot		0.01			0.01			c0.43			0.37	
v/s Ratio Perm	0.04			c0.21			0.34			0.22		
v/c Ratio	0.17	0.04		0.87	0.02		0.58	0.73		0.38	0.63	
Uniform Delay, d1	23.8	23.0		29.0	22.9		10.1	11.7		8.5	10.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.0		22.4	0.0		14.7	2.3		8.7	1.4	
Delay (s)	24.0	23.0		51.4	22.9		24.9	14.0		17.3	12.0	
Level of Service	C	C		D	C		C	B		B	B	
Approach Delay (s)		23.5			48.4			14.6			12.2	
Approach LOS		C			D			B			B	

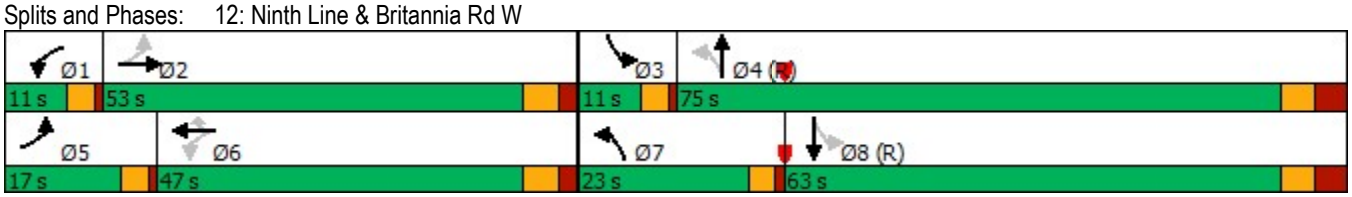
Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	288	729	92	1299	101	400	1113	90	1061
Future Volume (vph)	288	729	92	1299	101	400	1113	90	1061
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	5	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0
Minimum Split (s)	11.0	26.1	11.0	26.1	26.1	11.0	47.7	11.0	47.7
Total Split (s)	17.0	53.0	11.0	47.0	47.0	23.0	75.0	11.0	63.0
Total Split (%)	11.3%	35.3%	7.3%	31.3%	31.3%	15.3%	50.0%	7.3%	42.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.1	1.0	2.1	2.1	1.0	3.7	1.0	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	4.0	6.1	6.1	4.0	7.7	4.0	7.7
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	60.0	46.9	50.0	40.9	40.9	82.0	67.3	66.0	55.3
Actuated g/C Ratio	0.40	0.31	0.33	0.27	0.27	0.55	0.45	0.44	0.37
v/c Ratio	1.39	1.00	0.69	1.32	0.19	1.45	0.76	0.54	1.11
Control Delay	234.6	75.1	56.1	193.0	1.9	255.5	38.2	30.2	101.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	234.6	75.1	56.1	193.0	1.9	255.5	38.2	30.2	101.7
LOS	F	E	E	F	A	F	D	C	F
Approach Delay		107.5		171.6			92.6		97.4
Approach LOS		F		F			F		F

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 116.9	Intersection LOS: F
Intersection Capacity Utilization 133.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	288	1129	92	1299	101	400	1196	90	1430
v/c Ratio	1.39	1.00	0.69	1.32	0.19	1.45	0.76	0.54	1.11
Control Delay	234.6	75.1	56.1	193.0	1.9	255.5	38.2	30.2	101.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	234.6	75.1	56.1	193.0	1.9	255.5	38.2	30.2	101.7
Queue Length 50th (m)	~90.2	~156.2	15.9	~241.0	0.0	~134.4	141.4	11.5	~230.9
Queue Length 95th (m)	#144.8	#201.2	#32.8	#280.2	2.6	#194.8	166.7	19.7	#270.9
Internal Link Dist (m)		80.1		420.4			341.1		608.8
Turn Bay Length (m)	80.0		70.0		70.0	75.0		60.0	
Base Capacity (vph)	207	1126	134	985	524	276	1579	167	1294
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.39	1.00	0.69	1.32	0.19	1.45	0.76	0.54	1.11

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	729	400	92	1299	101	400	1113	83	90	1061	369
Future Volume (vph)	288	729	400	92	1299	101	400	1113	83	90	1061	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1		4.0	6.1	6.1	4.0	7.7		4.0	7.7	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	3444		1767	3614	1521	1767	3509		1668	3449	
Flt Permitted	0.09	1.00		0.10	1.00	1.00	0.07	1.00		0.13	1.00	
Satd. Flow (perm)	167	3444		182	3614	1521	125	3509		228	3449	
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)	288	729	400	92	1299	101	400	1113	83	90	1061	369
RTOR Reduction (vph)	0	49	0	0	0	73	0	4	0	0	23	0
Lane Group Flow (vph)	288	1080	0	92	1299	28	400	1192	0	90	1407	0
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	57.9	46.9		47.9	40.9	40.9	78.3	67.3		62.3	55.3	
Effective Green, g (s)	57.9	46.9		47.9	40.9	40.9	78.3	67.3		62.3	55.3	
Actuated g/C Ratio	0.39	0.31		0.32	0.27	0.27	0.52	0.45		0.42	0.37	
Clearance Time (s)	4.0	6.1		4.0	6.1	6.1	4.0	7.7		4.0	7.7	
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)	204	1076		132	985	414	273	1574		161	1271	
v/s Ratio Prot	c0.12	0.31		0.03	0.36		c0.19	0.34		0.03	0.41	
v/s Ratio Perm	c0.42			0.19		0.02	c0.58			0.20		
v/c Ratio	1.41	1.00		0.70	1.32	0.07	1.47	0.76		0.56	1.11	
Uniform Delay, d1	43.8	51.5		41.4	54.5	40.4	50.4	34.5		29.7	47.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	211.8	28.2		14.8	150.7	0.3	228.4	3.5		4.2	59.8	
Delay (s)	255.5	79.8		56.3	205.2	40.7	278.7	38.0		33.9	107.2	
Level of Service	F	E		E	F	D	F	D		C	F	
Approach Delay (s)		115.5			184.9			98.3			102.8	
Approach LOS		F			F			F			F	

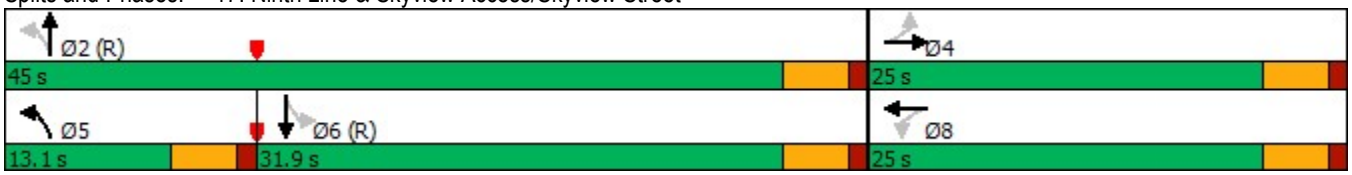
Intersection Summary			
HCM 2000 Control Delay	124.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.50		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.8
Intersection Capacity Utilization	133.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	78	5	4	5	293	1724	14	1377
Future Volume (vph)	78	5	4	5	293	1724	14	1377
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	9.5	24.0	24.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	13.1	45.0	31.9	31.9
Total Split (%)	35.7%	35.7%	35.7%	35.7%	18.7%	64.3%	45.6%	45.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.3	9.3	9.3	9.3	51.7	51.7	34.0	34.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.74	0.74	0.49	0.49
v/c Ratio	0.42	0.52	0.04	0.04	0.68	0.67	0.11	0.89
Control Delay	34.0	10.3	25.0	20.1	16.5	10.4	20.4	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	16.5	10.4	20.4	30.6
LOS	C	B	C	C	B	B	C	C
Approach Delay		17.1		21.6		11.3		30.6
Approach LOS		B		C		B		C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	78	194	4	9	293	1729	14	1497
v/c Ratio	0.42	0.52	0.04	0.04	0.68	0.67	0.11	0.89
Control Delay	34.0	10.3	25.0	20.1	16.5	10.4	20.4	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	16.5	10.4	20.4	30.6
Queue Length 50th (m)	8.8	0.5	0.4	0.6	29.4	174.8	1.3	107.3
Queue Length 95th (m)	18.4	14.4	2.5	3.6	m23.9	m160.4	m2.7	#212.3
Internal Link Dist (m)		116.4		136.1		258.9		162.9
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	405	594	238	506	434	2584	122	1688
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.33	0.02	0.02	0.68	0.67	0.11	0.89

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	5	189	4	5	4	293	1724	5	14	1377	120
Future Volume (vph)	78	5	189	4	5	4	293	1724	5	14	1377	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1573		1750	1719		1750	3498		1750	3458	
Flt Permitted	0.75	1.00		0.44	1.00		0.10	1.00		0.14	1.00	
Satd. Flow (perm)	1385	1573		814	1719		191	3498		253	3458	
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)	78	5	189	4	5	4	293	1724	5	14	1377	120
RTOR Reduction (vph)	0	164	0	0	3	0	0	0	0	0	8	0
Lane Group Flow (vph)	78	30	0	4	6	0	293	1729	0	14	1489	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Effective Green, g (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.49	0.49	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	208		108	228		435	2583		122	1679	
v/s Ratio Prot		0.02			0.00		0.13	c0.49			c0.43	
v/s Ratio Perm	c0.06			0.00			0.37			0.06		
v/c Ratio	0.42	0.14		0.04	0.02		0.67	0.67		0.11	0.89	
Uniform Delay, d1	27.9	26.8		26.4	26.4		16.0	4.7		9.8	16.3	
Progression Factor	1.00	1.00		1.00	1.00		1.25	1.90		1.42	1.36	
Incremental Delay, d2	1.6	0.3		0.1	0.0		1.3	0.4		1.7	6.5	
Delay (s)	29.5	27.2		26.6	26.4		21.4	9.4		15.6	28.7	
Level of Service	C	C		C	C		C	A		B	C	
Approach Delay (s)		27.8			26.5			11.2			28.6	
Approach LOS		C			C			B			C	

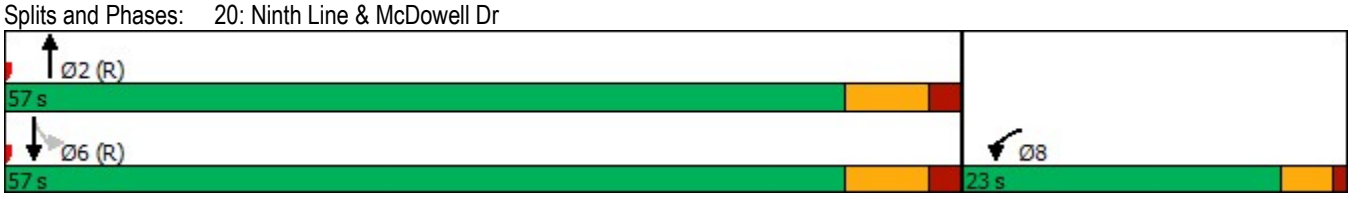
Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	117	1697	26	1441
Future Volume (vph)	117	1697	26	1441
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	57.0	57.0	57.0
Total Split (%)	28.8%	71.3%	71.3%	71.3%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.1	56.9	56.9	56.9
Actuated g/C Ratio	0.15	0.71	0.71	0.71
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	14.7	7.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	14.7	7.2
LOS	C	B	B	A
Approach Delay	34.9	10.7		7.4
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 19 (24%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 20: Ninth Line & McDowell Dr



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	176	1902	26	1441
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	14.7	7.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	14.7	7.2
Queue Length 50th (m)	19.5	71.7	1.1	42.2
Queue Length 95th (m)	34.3	125.0	7.2	71.5
Internal Link Dist (m)	322.0	187.3		341.1
Turn Bay Length (m)			25.0	
Base Capacity (vph)	438	2484	94	2545
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.77	0.28	0.57

Intersection Summary

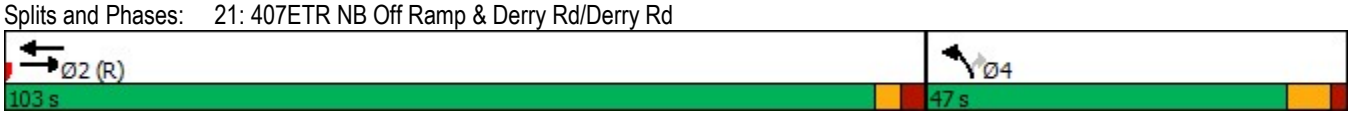
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	117	59	1697	205	26	1441
Future Volume (vph)	117	59	1697	205	26	1441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.98		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1757		3480		1785	3579
Flt Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1757		3480		133	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	59	1697	205	26	1441
RTOR Reduction (vph)	24	0	9	0	0	0
Lane Group Flow (vph)	152	0	1893	0	26	1441
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	12.1		56.9		56.9	56.9
Effective Green, g (s)	12.1		56.9		56.9	56.9
Actuated g/C Ratio	0.15		0.71		0.71	0.71
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	265		2475		94	2545
v/s Ratio Prot	c0.09		c0.54			0.40
v/s Ratio Perm					0.20	
v/c Ratio	0.57		0.76		0.28	0.57
Uniform Delay, d1	31.6		7.3		4.2	5.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	3.0		2.3		7.2	0.9
Delay (s)	34.6		9.6		11.3	6.5
Level of Service	C		A		B	A
Approach Delay (s)	34.6		9.6			6.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1157	2189	67	498
Future Volume (vph)	1157	2189	67	498
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	103.0	103.0	47.0	47.0
Total Split (%)	68.7%	68.7%	31.3%	31.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	98.5	98.5	42.5	42.5
Actuated g/C Ratio	0.66	0.66	0.28	0.28
v/c Ratio	0.49	0.95	0.08	0.99
Control Delay	13.9	34.1	39.9	79.9
Queue Delay	0.0	40.9	0.0	0.0
Total Delay	13.9	75.1	39.9	79.9
LOS	B	E	D	E
Approach Delay	13.9	75.1	75.1	
Approach LOS	B	E	E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 57.0	Intersection LOS: E
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1157	2189	67	498
v/c Ratio	0.49	0.95	0.08	0.99
Control Delay	13.9	34.1	39.9	79.9
Queue Delay	0.0	40.9	0.0	0.0
Total Delay	13.9	75.1	39.9	79.9
Queue Length 50th (m)	79.7	270.9	7.0	113.8
Queue Length 95th (m)	93.7	#316.1	12.7	#182.3
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2350	2304	831	502
Starvation Cap Reductn	0	301	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	1.09	0.08	0.99

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1157	0	0	2189	67	498
Future Volume (vph)	1157	0	0	2189	67	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1157	0	0	2189	67	498
RTOR Reduction (vph)	0	0	0	0	0	76
Lane Group Flow (vph)	1157	0	0	2189	67	422
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	97.0			97.0	40.0	40.0
Effective Green, g (s)	98.5			98.5	42.5	42.5
Actuated g/C Ratio	0.66			0.66	0.28	0.28
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2350			2304	831	426
v/s Ratio Prot	0.32			c0.62	0.02	
v/s Ratio Perm						c0.28
v/c Ratio	0.49			0.95	0.08	0.99
Uniform Delay, d1	13.1			23.5	39.4	53.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			10.2	0.2	41.4
Delay (s)	13.8			33.7	39.6	94.9
Level of Service	B			C	D	F
Approach Delay (s)	13.8			33.7	88.4	
Approach LOS	B			C	F	

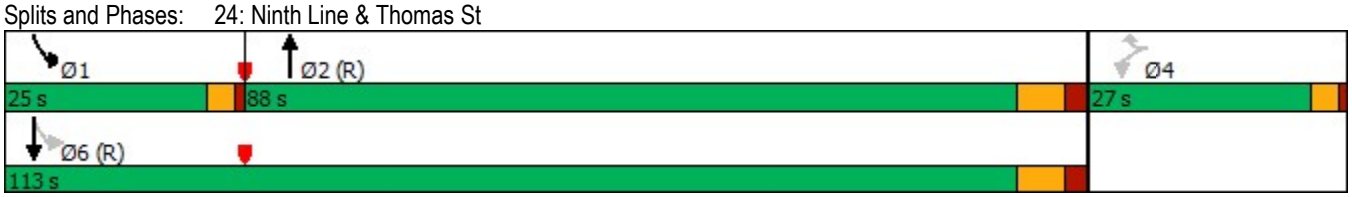
Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	178	322	1680	237	1313
Future Volume (vph)	178	322	1680	237	1313
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	27.0	27.0	88.0	25.0	113.0
Total Split (%)	19.3%	19.3%	62.9%	17.9%	80.7%
Yellow Time (s)	3.0	3.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	7.5	4.0	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	18.8	18.8	87.0	113.2	109.7
Actuated g/C Ratio	0.13	0.13	0.62	0.81	0.78
v/c Ratio	0.76	0.79	0.85	0.87	0.47
Control Delay	78.4	29.4	15.9	70.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	29.4	15.9	70.1	6.1
LOS	E	C	B	E	A
Approach Delay	46.9		15.9		15.9
Approach LOS	D		B		B

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	178	322	1842	237	1313
v/c Ratio	0.76	0.79	0.85	0.87	0.47
Control Delay	78.4	29.4	15.9	70.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	29.4	15.9	70.1	6.1
Queue Length 50th (m)	44.1	19.2	133.7	44.8	53.0
Queue Length 95th (m)	66.0	51.4	159.0	#82.8	71.5
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	286	447	2177	300	2804
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.72	0.85	0.79	0.47

Intersection Summary

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

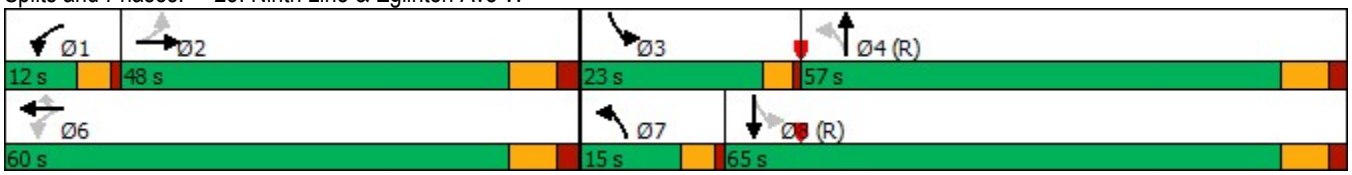
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	178	322	1680	162	237	1313
Future Volume (vph)	178	322	1680	162	237	1313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0	4.0	7.5		4.0	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1746	1493	3497		1653	3579
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	1746	1493	3497		76	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	178	322	1680	162	237	1313
RTOR Reduction (vph)	0	210	5	0	0	0
Lane Group Flow (vph)	178	112	1837	0	237	1313
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	18.8	18.8	87.0		109.7	109.7
Effective Green, g (s)	18.8	18.8	87.0		109.7	109.7
Actuated g/C Ratio	0.13	0.13	0.62		0.78	0.78
Clearance Time (s)	4.0	4.0	7.5		4.0	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	200	2173		270	2804
v/s Ratio Prot			0.53		c0.12	0.37
v/s Ratio Perm	c0.10	0.08			c0.57	
v/c Ratio	0.76	0.56	0.85		0.88	0.47
Uniform Delay, d1	58.4	56.7	21.1		47.8	5.2
Progression Factor	1.00	1.00	0.56		1.00	1.00
Incremental Delay, d2	13.6	3.6	2.8		25.8	0.6
Delay (s)	72.0	60.3	14.6		73.6	5.7
Level of Service	E	E	B		E	A
Approach Delay (s)	64.5		14.6			16.1
Approach LOS	E		B			B

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	54	562	154	728	538	110	1244	374	1042
Future Volume (vph)	54	562	154	728	538	110	1244	374	1042
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases		2	1	6		7	4	3	8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	1	6	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	11.0	40.0
Total Split (s)	48.0	48.0	12.0	60.0	60.0	15.0	57.0	23.0	65.0
Total Split (%)	34.3%	34.3%	8.6%	42.9%	42.9%	10.7%	40.7%	16.4%	46.4%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	40.5	40.5	55.5	52.5	52.5	62.9	50.0	76.0	58.1
Actuated g/C Ratio	0.29	0.29	0.40	0.38	0.38	0.45	0.36	0.54	0.42
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	190.7	41.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	190.7	41.1
LOS	F	F	F	F	C	E	F	F	D
Approach Delay		135.9		68.0			124.3		79.3
Approach LOS		F		E			F		E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 20 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 97.3	Intersection LOS: F
Intersection Capacity Utilization 128.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	622	154	728	538	110	1452	374	1091
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.18	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	190.7	41.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	129.1	190.7	41.1
Queue Length 50th (m)	~15.3	~185.5	~27.1	~200.2	66.6	13.9	~232.4	~104.3	152.7
Queue Length 95th (m)	#41.7	#252.6	#69.0	#268.9	110.6	#40.9	#272.2	m#140.1	172.8
Internal Link Dist (m)		373.3		388.7			291.0		258.9
Turn Bay Length (m)	20.0		35.0			65.0		65.0	
Base Capacity (vph)	50	542	148	699	712	139	1231	287	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.79	1.18	1.30	0.74

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Future Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	1863		1733	1865	1479	1069	3418		1716	3558	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.14	1.00		0.07	1.00	
Satd. Flow (perm)	173	1863		162	1865	1479	157	3418		134	3558	
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)	54	562	60	154	728	538	110	1244	208	374	1042	49
RTOR Reduction (vph)	0	3	0	0	0	158	0	10	0	0	2	0
Lane Group Flow (vph)	54	619	0	154	728	381	110	1442	0	374	1089	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Effective Green, g (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0		73.0	58.1	
Actuated g/C Ratio	0.29	0.29		0.38	0.38	0.38	0.43	0.36		0.52	0.42	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0		4.0	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)	50	538		144	699	554	135	1220		284	1476	
v/s Ratio Prot		c0.33		0.06	c0.39		0.06	0.42		c0.18	0.31	
v/s Ratio Perm	0.31			0.34		0.26	0.29			c0.51		
v/c Ratio	1.08	1.15		1.07	1.04	0.69	0.81	1.18		1.32	0.74	
Uniform Delay, d1	49.8	49.8		37.8	43.8	36.8	28.3	45.0		46.2	34.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.26	1.13	
Incremental Delay, d2	151.5	87.7		94.7	45.3	3.5	30.0	90.7		155.8	1.8	
Delay (s)	201.2	137.4		132.6	89.1	40.4	58.3	135.7		214.2	40.8	
Level of Service	F	F		F	F	D	E	F		F	D	
Approach Delay (s)		142.5			75.3			130.2			85.0	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	103.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	128.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	97	1751	65	1460
Future Volume (vph)	97	1751	65	1460
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	47.0	47.0	47.0
Total Split (%)	32.9%	67.1%	67.1%	67.1%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.3	46.7	46.7	46.7
Actuated g/C Ratio	0.18	0.67	0.67	0.67
v/c Ratio	0.60	0.78	0.64	0.61
Control Delay	31.4	3.7	37.4	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	3.7	37.4	5.8
LOS	C	A	D	A
Approach Delay	31.4	3.7		7.2
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 32 (46%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 74.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	1826	65	1460
v/c Ratio	0.60	0.78	0.64	0.61
Control Delay	31.4	3.7	37.4	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	3.7	37.4	5.8
Queue Length 50th (m)	19.4	2.9	3.1	35.8
Queue Length 95th (m)	33.5	m17.2	m#38.5	53.2
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	484	2348	101	2388
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.78	0.64	0.61

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.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	97	94	1751	75	65	1460
Future Volume (vph)	97	94	1751	75	65	1460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.93		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1740		3514		1684	3579
Flt Permitted	0.98		1.00		0.09	1.00
Satd. Flow (perm)	1740		3514		152	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	94	1751	75	65	1460
RTOR Reduction (vph)	14	0	3	0	0	0
Lane Group Flow (vph)	177	0	1823	0	65	1460
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.3		46.7		46.7	46.7
Effective Green, g (s)	12.3		46.7		46.7	46.7
Actuated g/C Ratio	0.18		0.67		0.67	0.67
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	305		2344		101	2387
v/s Ratio Prot			c0.52			0.41
v/s Ratio Perm	c0.10				0.43	
v/c Ratio	0.58		0.78		0.64	0.61
Uniform Delay, d1	26.5		8.1		6.8	6.6
Progression Factor	1.00		0.28		0.84	0.67
Incremental Delay, d2	2.8		1.2		24.9	1.1
Delay (s)	29.3		3.5		30.6	5.4
Level of Service	C		A		C	A
Approach Delay (s)	29.3		3.5			6.5
Approach LOS	C		A			A

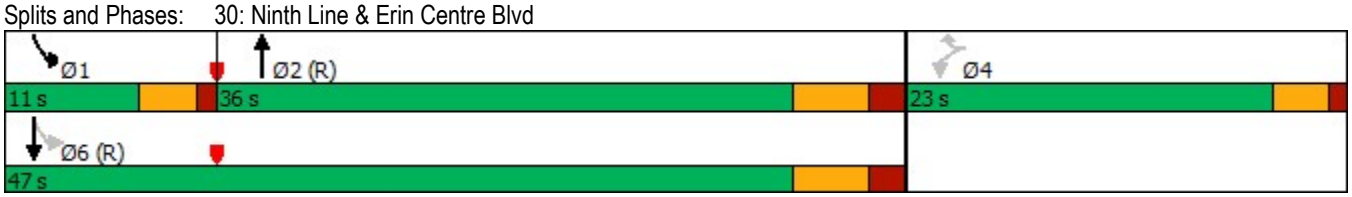
Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	132	158	1688	143	1361
Future Volume (vph)	132	158	1688	143	1361
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	23.0	23.0	36.0	11.0	47.0
Total Split (%)	32.9%	32.9%	51.4%	15.7%	67.1%
Yellow Time (s)	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.6	10.6	39.8	51.4	49.4
Actuated g/C Ratio	0.15	0.15	0.57	0.73	0.71
v/c Ratio	0.49	0.42	0.93	0.47	0.54
Control Delay	32.9	8.4	28.6	17.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	8.4	28.6	17.1	4.5
LOS	C	A	C	B	A
Approach Delay	19.5		28.6		5.7
Approach LOS	B		C		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 68 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 18.3	Intersection LOS: B
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	132	158	1813	143	1361
v/c Ratio	0.49	0.42	0.93	0.47	0.54
Control Delay	32.9	8.4	28.6	17.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	8.4	28.6	17.1	4.5
Queue Length 50th (m)	14.8	0.0	154.7	8.8	16.9
Queue Length 95th (m)	26.8	12.1	#275.6	21.8	42.8
Internal Link Dist (m)	358.4		268.3		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	479	548	1944	307	2523
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.29	0.93	0.47	0.54

Intersection Summary

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

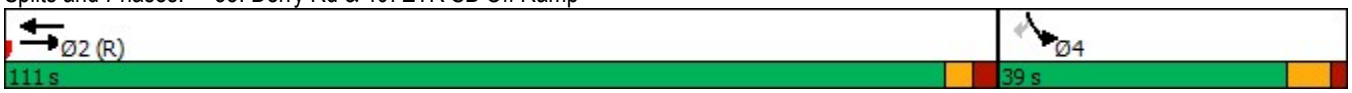
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	132	158	1688	125	143	1361
Future Volume (vph)	132	158	1688	125	143	1361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0	4.0	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3409		1785	3579
Flt Permitted	0.95	1.00	1.00		0.09	1.00
Satd. Flow (perm)	1765	1597	3409		175	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	132	158	1688	125	143	1361
RTOR Reduction (vph)	0	134	6	0	0	0
Lane Group Flow (vph)	132	24	1807	0	143	1361
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	10.6	10.6	39.0		49.4	49.4
Effective Green, g (s)	10.6	10.6	39.0		49.4	49.4
Actuated g/C Ratio	0.15	0.15	0.56		0.71	0.71
Clearance Time (s)	4.0	4.0	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	267	241	1899		270	2525
v/s Ratio Prot			c0.53		0.05	c0.38
v/s Ratio Perm	c0.07	0.01			0.32	
v/c Ratio	0.49	0.10	0.95		0.53	0.54
Uniform Delay, d1	27.2	25.6	14.6		12.9	4.9
Progression Factor	1.00	1.00	1.28		2.81	0.72
Incremental Delay, d2	1.4	0.2	9.9		1.5	0.7
Delay (s)	28.7	25.8	28.6		37.8	4.2
Level of Service	C	C	C		D	A
Approach Delay (s)	27.1		28.6			7.4
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1330	2156	361	219
Future Volume (vph)	1330	2156	361	219
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	111.0	111.0	39.0	39.0
Total Split (%)	74.0%	74.0%	26.0%	26.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	111.5	111.5	29.5	29.5
Actuated g/C Ratio	0.74	0.74	0.20	0.20
v/c Ratio	0.50	0.83	0.58	0.81
Control Delay	9.1	17.4	58.0	75.0
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	9.1	18.7	58.0	75.0
LOS	A	B	E	E
Approach Delay	9.1	18.7	64.4	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1330	2156	361	219
v/c Ratio	0.50	0.83	0.58	0.81
Control Delay	9.1	17.4	58.0	75.0
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	9.1	18.7	58.0	75.0
Queue Length 50th (m)	73.5	195.1	46.1	53.0
Queue Length 95th (m)	94.3	249.2	59.6	79.3
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	2686	2609	724	314
Starvation Cap Reductn	0	242	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.91	0.50	0.70

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1330	2156	0	361	219
Future Volume (vph)	0	1330	2156	0	361	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1330	2156	0	361	219
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	0	1330	2156	0	361	205
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		110.0	110.0		27.0	27.0
Effective Green, g (s)		111.5	111.5		29.5	29.5
Actuated g/C Ratio		0.74	0.74		0.20	0.20
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2686	2609		619	257
v/s Ratio Prot		0.37	c0.61		0.11	
v/s Ratio Perm						c0.16
v/c Ratio		0.50	0.83		0.58	0.80
Uniform Delay, d1		7.8	12.8		54.7	57.4
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.7	3.2		1.4	15.8
Delay (s)		8.5	16.0		56.1	73.2
Level of Service		A	B		E	E
Approach Delay (s)		8.5	16.0		62.5	
Approach LOS		A	B		E	

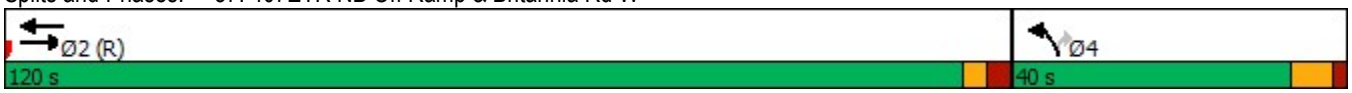
Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1439	1974	197	118
Future Volume (vph)	1439	1974	197	118
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	120.0	120.0	40.0	40.0
Total Split (%)	75.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	123.7	123.7	27.3	27.3
Actuated g/C Ratio	0.77	0.77	0.17	0.17
v/c Ratio	0.52	0.71	0.72	0.36
Control Delay	8.2	11.8	76.9	24.1
Queue Delay	0.3	2.8	0.0	0.0
Total Delay	8.5	14.6	76.9	24.1
LOS	A	B	E	C
Approach Delay	8.5	14.6	57.1	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 73.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1439	1974	197	118
v/c Ratio	0.52	0.71	0.72	0.36
Control Delay	8.2	11.8	76.9	24.1
Queue Delay	0.3	2.8	0.0	0.0
Total Delay	8.5	14.6	76.9	24.1
Queue Length 50th (m)	74.4	137.0	55.3	10.4
Queue Length 95th (m)	108.4	197.8	76.8	26.6
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2793	2766	356	407
Starvation Cap Reductn	622	652	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.93	0.55	0.29

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1439	0	0	1974	197	118
Future Volume (vph)	1439	0	0	1974	197	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1439	0	0	1974	197	118
RTOR Reduction (vph)	0	0	0	0	0	64
Lane Group Flow (vph)	1439	0	0	1974	197	54
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	122.2			122.2	24.8	24.8
Effective Green, g (s)	123.7			123.7	27.3	27.3
Actuated g/C Ratio	0.77			0.77	0.17	0.17
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2794			2767	274	267
v/s Ratio Prot	0.40			c0.55	c0.12	
v/s Ratio Perm						0.03
v/c Ratio	0.52			0.71	0.72	0.20
Uniform Delay, d1	6.8			9.2	62.7	57.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			1.6	8.7	0.4
Delay (s)	7.5			10.8	71.4	57.4
Level of Service	A			B	E	E
Approach Delay (s)	7.5			10.8	66.2	
Approach LOS	A			B	E	

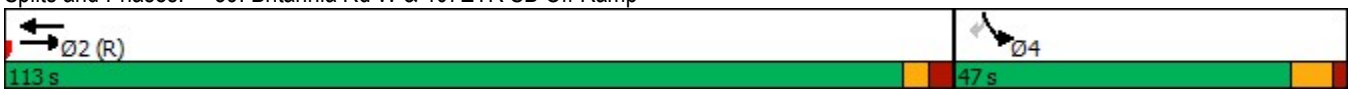
Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1451	2054	164	224
Future Volume (vph)	1451	2054	164	224
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	113.0	113.0	47.0	47.0
Total Split (%)	70.6%	70.6%	29.4%	29.4%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	116.6	116.6	34.4	34.4
Actuated g/C Ratio	0.73	0.73	0.22	0.22
v/c Ratio	0.55	0.79	0.45	0.82
Control Delay	11.6	17.9	57.4	77.3
Queue Delay	0.0	1.5	0.0	0.0
Total Delay	11.6	19.4	57.4	77.3
LOS	B	B	E	E
Approach Delay	11.6	19.4	68.9	
Approach LOS	B	B	E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1451	2054	164	224
v/c Ratio	0.55	0.79	0.45	0.82
Control Delay	11.6	17.9	57.4	77.3
Queue Delay	0.0	1.5	0.0	0.0
Total Delay	11.6	19.4	57.4	77.3
Queue Length 50th (m)	95.2	189.7	41.9	58.1
Queue Length 95th (m)	129.8	255.8	60.1	83.7
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2634	2609	447	334
Starvation Cap Reductn	0	350	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.91	0.37	0.67

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1451	2054	0	164	224
Future Volume (vph)	0	1451	2054	0	164	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1451	2054	0	164	224
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	0	1451	2054	0	164	210
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		115.1	115.1		31.9	31.9
Effective Green, g (s)		116.6	116.6		34.4	34.4
Actuated g/C Ratio		0.73	0.73		0.21	0.21
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2633	2608		362	260
v/s Ratio Prot		0.40	c0.57		0.10	
v/s Ratio Perm						c0.17
v/c Ratio		0.55	0.79		0.45	0.81
Uniform Delay, d1		9.8	13.8		54.6	59.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8	2.5		0.9	16.6
Delay (s)		10.7	16.3		55.5	76.2
Level of Service		B	B		E	E
Approach Delay (s)		10.7	16.3		67.5	
Approach LOS		B	B		E	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	25	22	0	17	32	1312	61	43	1334	120
Future Volume (Veh/h)	18	0	25	22	0	17	32	1312	61	43	1334	120
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)	18	0	25	22	0	17	32	1312	61	43	1334	120
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.71	0.71		0.71	0.71	0.71				0.71		
vC, conflicting volume	2217	2917	727	2184	2946	686	1454			1373		
vC1, stage 1 conf vol	1480	1480		1406	1406							
vC2, stage 2 conf vol	737	1437		778	1540							
vCu, unblocked vol	1893	2883	727	1848	2924	0	1454			701		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	93	88	100	98	93			93		
cM capacity (veh/h)	118	129	366	180	113	772	461			627		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	18	25	22	17	32	875	498	43	889	565
Volume Left	18	0	22	0	32	0	0	43	0	0
Volume Right	0	25	0	17	0	0	61	0	0	120
cSH	118	366	180	772	461	1700	1700	627	1700	1700
Volume to Capacity	0.15	0.07	0.12	0.02	0.07	0.51	0.29	0.07	0.52	0.33
Queue Length 95th (m)	3.6	1.5	2.9	0.5	1.6	0.0	0.0	1.5	0.0	0.0
Control Delay (s)	41.1	15.5	27.8	9.8	13.4	0.0	0.0	11.2	0.0	0.0
Lane LOS	E	C	D	A	B			B		
Approach Delay (s)	26.2		19.9		0.3			0.3		
Approach LOS	D		C							

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	22	38	1819	1474	20
Future Volume (Veh/h)	12	22	38	1819	1474	20
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	22	38	1819	1474	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				187	292	
pX, platoon unblocked	0.81	0.80	0.80			
vC, conflicting volume	2470	747	1494			
vC1, stage 1 conf vol	1484					
vC2, stage 2 conf vol	986					
vCu, unblocked vol	1218	180	1115			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	92			
cM capacity (veh/h)	215	665	497			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	22	38	910	910	983	511
Volume Left	12	0	38	0	0	0	0
Volume Right	0	22	0	0	0	0	20
cSH	215	665	497	1700	1700	1700	1700
Volume to Capacity	0.06	0.03	0.08	0.54	0.54	0.58	0.30
Queue Length 95th (m)	1.2	0.7	1.7	0.0	0.0	0.0	0.0
Control Delay (s)	22.8	10.6	12.8	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	14.9		0.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	5	8	1178	1515	57
Future Volume (Veh/h)	12	5	8	1178	1515	57
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	5	8	1178	1515	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				397	203	
pX, platoon unblocked	0.85	0.79	0.79			
vC, conflicting volume	2148	786	1572			
vC1, stage 1 conf vol	1544					
vC2, stage 2 conf vol	605					
vCu, unblocked vol	1329	190	1188			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	98			
cM capacity (veh/h)	201	646	460			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	12	5	401	785	1010	562
Volume Left	12	0	8	0	0	0
Volume Right	0	5	0	0	0	57
cSH	201	646	460	1700	1700	1700
Volume to Capacity	0.06	0.01	0.02	0.46	0.59	0.33
Queue Length 95th (m)	1.3	0.2	0.4	0.0	0.0	0.0
Control Delay (s)	24.1	10.6	0.5	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	20.1		0.2		0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	15	28	1236	1456	48
Future Volume (Veh/h)	25	15	28	1236	1456	48
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)	25	15	28	1236	1456	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					384	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	2154	752	1504			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1873	5	1007			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	45	98	95			
cM capacity (veh/h)	45	808	513			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	25	15	28	618	618	971	533
Volume Left	25	0	28	0	0	0	0
Volume Right	0	15	0	0	0	0	48
cSH	45	808	513	1700	1700	1700	1700
Volume to Capacity	0.55	0.02	0.05	0.36	0.36	0.57	0.31
Queue Length 95th (m)	14.4	0.4	1.2	0.0	0.0	0.0	0.0
Control Delay (s)	157.8	9.5	12.4	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	102.2		0.3			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	400	1469	122	581	400	858	23	656	391
Future Volume (vph)	400	1469	122	581	400	858	23	656	391
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases	5	2	1	6	7	4		8	
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	1	6	7	4	8	8	8
Switch Phase									
Minimum Initial (s)	7.0	8.0	7.0	8.0	7.0	8.0	8.0	8.0	8.0
Minimum Split (s)	11.5	30.1	11.0	30.1	11.0	29.4	29.4	29.4	29.4
Total Split (s)	37.6	67.0	11.0	40.4	29.0	62.0	33.0	33.0	33.0
Total Split (%)	26.9%	47.9%	7.9%	28.9%	20.7%	44.3%	23.6%	23.6%	23.6%
Yellow Time (s)	3.5	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.1	1.0	2.1	1.0	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.1	4.0	6.1	4.0	6.4	6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lag	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	73.5	60.9	48.4	39.3	58.0	55.6	26.6	26.6	26.6
Actuated g/C Ratio	0.52	0.44	0.35	0.28	0.41	0.40	0.19	0.19	0.19
v/c Ratio	0.86	1.08	0.87	0.64	1.08	0.78	0.32	0.96	0.63
Control Delay	43.8	84.0	79.1	48.4	113.7	35.4	62.1	81.0	9.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	84.3	79.1	48.4	113.7	35.4	62.1	81.0	9.6
LOS	D	F	E	D	F	D	E	F	A
Approach Delay		76.5		53.4		56.3		54.5	
Approach LOS		E		D		E		D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 104 (74%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 63.3	Intersection LOS: E
Intersection Capacity Utilization 111.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	400	1670	122	625	400	1099	23	656	391
v/c Ratio	0.86	1.08	0.87	0.64	1.08	0.78	0.32	0.96	0.63
Control Delay	43.8	84.0	79.1	48.4	113.7	35.4	62.1	81.0	9.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	84.3	79.1	48.4	113.7	35.4	62.1	81.0	9.6
Queue Length 50th (m)	63.4	~248.2	17.0	74.8	~98.8	86.6	5.1	88.1	0.0
Queue Length 95th (m)	#100.5	#287.7	#53.7	97.1	#161.5	115.3	14.0	#122.4	26.7
Internal Link Dist (m)		119.7		244.5		681.0		237.0	
Turn Bay Length (m)	75.0		80.0		130.0		95.0		80.0
Base Capacity (vph)	509	1552	141	978	369	1403	73	686	617
Starvation Cap Reductn	0	1	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	0.79	1.08	0.87	0.64	1.08	0.78	0.32	0.96	0.63

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
Future Volume (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.5	6.1		4.0	6.1		4.0	6.4		6.4	6.4	6.4
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1684	3553		1733	3477		1750	3488		1716	3614	1581
Flt Permitted	0.22	1.00		0.10	1.00		0.13	1.00		0.22	1.00	1.00
Satd. Flow (perm)	384	3553		186	3477		241	3488		389	3614	1581
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
RTOR Reduction (vph)	0	7	0	0	4	0	0	19	0	0	0	317
Lane Group Flow (vph)	400	1663	0	122	621	0	400	1080	0	23	656	74
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	71.9	60.9		46.3	39.3		55.6	55.6		26.6	26.6	26.6
Effective Green, g (s)	71.9	60.9		46.3	39.3		55.6	55.6		26.6	26.6	26.6
Actuated g/C Ratio	0.51	0.43		0.33	0.28		0.40	0.40		0.19	0.19	0.19
Clearance Time (s)	4.5	6.1		4.0	6.1		4.0	6.4		6.4	6.4	6.4
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)	458	1545		138	976		365	1385		73	686	300
v/s Ratio Prot	c0.18	c0.47		0.04	0.18		c0.20	0.31			0.18	
v/s Ratio Perm	0.27			0.25			c0.24			0.06		0.05
v/c Ratio	0.87	1.08		0.88	0.64		1.10	0.78		0.32	0.96	0.25
Uniform Delay, d1	26.2	39.5		38.8	44.1		43.1	36.9		48.9	56.1	48.2
Progression Factor	1.00	1.00		1.00	1.00		1.30	0.88		1.00	1.00	1.00
Incremental Delay, d2	16.6	46.4		43.7	3.2		70.3	3.5		11.0	25.2	2.0
Delay (s)	42.9	86.0		82.6	47.3		126.4	36.0		59.8	81.3	50.2
Level of Service	D	F		F	D		F	D		E	F	D
Approach Delay (s)		77.6			53.0			60.1			69.5	
Approach LOS		E			D			E			E	

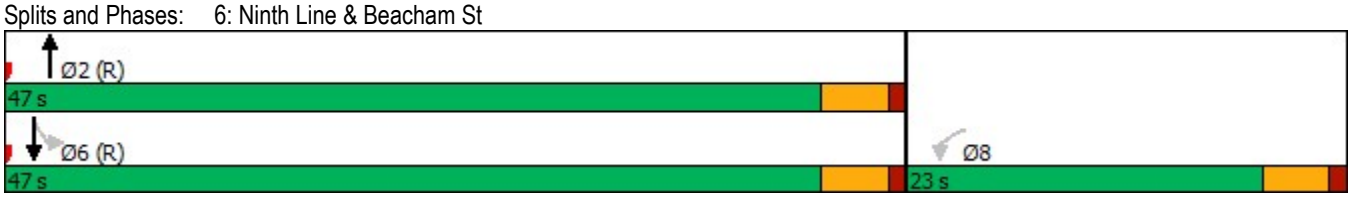
Intersection Summary			
HCM 2000 Control Delay	67.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	111.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	130	1423	90	946
Future Volume (vph)	130	1423	90	946
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	23.0	47.0	47.0	47.0
Total Split (%)	32.9%	67.1%	67.1%	67.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.5	48.5	48.5	48.5
Actuated g/C Ratio	0.18	0.69	0.69	0.69
v/c Ratio	0.64	0.63	0.58	0.39
Control Delay	28.9	16.7	25.2	2.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.9	16.7	25.2	2.7
LOS	C	B	C	A
Approach Delay	28.9	16.7		4.6
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 62 (89%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	225	1551	90	946
v/c Ratio	0.64	0.63	0.58	0.39
Control Delay	28.9	16.7	25.2	2.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.9	16.7	25.2	2.7
Queue Length 50th (m)	19.9	104.6	6.7	11.4
Queue Length 95th (m)	35.0	117.8	m9.1	m16.4
Internal Link Dist (m)	168.5	178.7		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	496	2457	155	2455
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.63	0.58	0.39

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	95	1423	128	90	946
Future Volume (vph)	130	95	1423	128	90	946
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.5		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1748		3534		1785	3544
Flt Permitted	0.97		1.00		0.12	1.00
Satd. Flow (perm)	1748		3534		224	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	95	1423	128	90	946
RTOR Reduction (vph)	39	0	7	0	0	0
Lane Group Flow (vph)	186	0	1544	0	90	946
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.5		48.5		48.5	48.5
Effective Green, g (s)	12.5		48.5		48.5	48.5
Actuated g/C Ratio	0.18		0.69		0.69	0.69
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	312		2448		155	2455
v/s Ratio Prot			c0.44			0.27
v/s Ratio Perm	c0.11				0.40	
v/c Ratio	0.60		0.63		0.58	0.39
Uniform Delay, d1	26.4		5.9		5.5	4.5
Progression Factor	1.00		2.48		2.17	0.50
Incremental Delay, d2	3.1		0.7		6.1	0.2
Delay (s)	29.5		15.3		18.0	2.4
Level of Service	C		B		B	A
Approach Delay (s)	29.5		15.3			3.8
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	133	13	111	5	17	1376	136	934
Future Volume (vph)	133	13	111	5	17	1376	136	934
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		6	5	2
Permitted Phases	4		8		6		2	
Detector Phase	4	4	8	8	6	6	5	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	5.0	5.0	8.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	11.5	25.0
Total Split (s)	22.6	22.6	22.6	22.6	35.8	35.8	11.6	47.4
Total Split (%)	32.3%	32.3%	32.3%	32.3%	51.1%	51.1%	16.6%	67.7%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	4.5	4.5	7.0	7.0	4.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	13.1	13.1	15.1	15.1	34.3	34.3	46.4	43.4
Actuated g/C Ratio	0.19	0.19	0.22	0.22	0.49	0.49	0.66	0.62
v/c Ratio	0.73	0.19	0.40	0.40	0.06	0.87	0.46	0.43
Control Delay	49.1	10.5	27.0	6.6	17.5	34.1	11.6	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	10.5	27.0	6.6	17.5	34.1	11.6	10.5
LOS	D	B	C	A	B	C	B	B
Approach Delay		36.2		14.0		33.9		10.6
Approach LOS		D		B		C		B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	67	111	194	17	1512	136	951
v/c Ratio	0.73	0.19	0.40	0.40	0.06	0.87	0.46	0.43
Control Delay	49.1	10.5	27.0	6.6	17.5	34.1	11.6	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	10.5	27.0	6.6	17.5	34.1	11.6	10.5
Queue Length 50th (m)	15.0	1.3	11.4	0.5	1.9	128.3	9.0	78.1
Queue Length 95th (m)	#33.2	9.3	22.6	13.0	m3.4	#156.9	16.2	82.0
Internal Link Dist (m)		131.2		392.7		51.3		372.4
Turn Bay Length (m)			25.0		20.0		80.0	
Base Capacity (vph)	225	413	336	550	270	1734	299	2213
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	0.59	0.16	0.33	0.35	0.06	0.87	0.45	0.43

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	13	54	111	5	189	17	1376	136	136	934	17
Future Volume (vph)	133	13	54	111	5	189	17	1376	136	136	934	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		4.5	4.5		7.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.88		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1619		1733	1588		1750	3524		1750	3569	
Flt Permitted	0.53	1.00		0.71	1.00		0.30	1.00		0.11	1.00	
Satd. Flow (perm)	980	1619		1301	1588		554	3524		196	3569	
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)	133	13	54	111	5	189	17	1376	136	136	934	17
RTOR Reduction (vph)	0	44	0	0	148	0	0	9	0	0	2	0
Lane Group Flow (vph)	133	23	0	111	46	0	17	1503	0	136	949	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	13.1	13.1		15.1	15.1		33.5	33.5		43.4	43.4	
Effective Green, g (s)	13.1	13.1		15.1	15.1		33.5	33.5		43.4	43.4	
Actuated g/C Ratio	0.19	0.19		0.22	0.22		0.48	0.48		0.62	0.62	
Clearance Time (s)	6.5	6.5		4.5	4.5		7.0	7.0		4.0	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)	183	302		280	342		265	1686		252	2212	
v/s Ratio Prot		0.01			0.03			c0.43		c0.05	0.27	
v/s Ratio Perm	c0.14			0.09			0.03			0.29		
v/c Ratio	0.73	0.08		0.40	0.13		0.06	0.89		0.54	0.43	
Uniform Delay, d1	26.8	23.5		23.5	22.2		9.8	16.6		11.6	6.9	
Progression Factor	1.00	1.00		1.00	1.00		1.38	1.63		1.23	1.36	
Incremental Delay, d2	13.4	0.1		0.9	0.2		0.4	6.9		2.1	0.6	
Delay (s)	40.2	23.6		24.5	22.3		14.0	33.9		16.3	9.9	
Level of Service	D	C		C	C		B	C		B	A	
Approach Delay (s)		34.6			23.1			33.6			10.7	
Approach LOS		C			C			C			B	

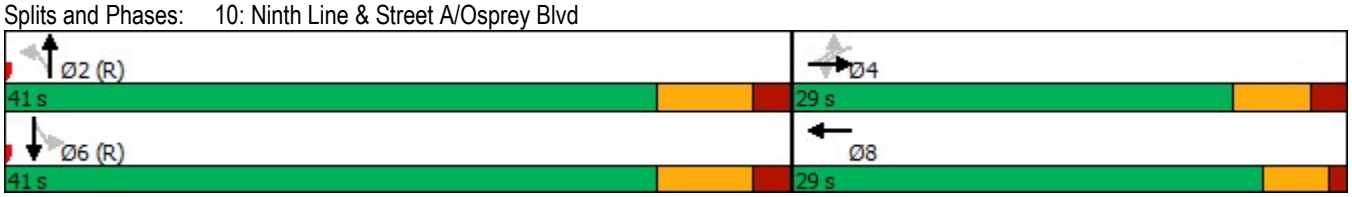
Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	0	232	0	30	1135	30	1065
Future Volume (vph)	93	0	232	0	30	1135	30	1065
Turn Type	Perm	NA	D.Pm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		4		2		6	
Detector Phase	4	4	4	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	8.0	8.0
Minimum Split (s)	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.0
Total Split (s)	29.0	29.0	29.0	29.0	41.0	41.0	41.0	41.0
Total Split (%)	41.4%	41.4%	41.4%	41.4%	58.6%	58.6%	58.6%	58.6%
Yellow Time (s)	4.0	4.0	4.0	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.5	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	17.7	17.7	17.7	19.2	39.3	39.3	39.3	39.3
Actuated g/C Ratio	0.25	0.25	0.25	0.27	0.56	0.56	0.56	0.56
v/c Ratio	0.28	0.21	0.75	0.18	0.13	0.65	0.18	0.54
Control Delay	21.6	9.3	38.6	8.2	8.7	8.8	11.3	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	9.3	38.6	8.2	8.7	8.8	11.3	9.3
LOS	C	A	D	A	A	A	B	A
Approach Delay		15.5		30.4		8.8		9.3
Approach LOS		B		C		A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 39 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 11.8	Intersection LOS: B
Intersection Capacity Utilization 64.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	93	232	86	30	1254	30	1073
v/c Ratio	0.28	0.21	0.75	0.18	0.13	0.65	0.18	0.54
Control Delay	21.6	9.3	38.6	8.2	8.7	8.8	11.3	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	9.3	38.6	8.2	8.7	8.8	11.3	9.3
Queue Length 50th (m)	8.9	2.8	25.4	2.1	1.5	40.9	1.7	38.9
Queue Length 95th (m)	17.3	10.8	42.5	9.5	m3.4	82.6	5.3	51.6
Internal Link Dist (m)		114.7		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	424	556	402	588	226	1940	170	2005
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	0.22	0.17	0.58	0.15	0.13	0.65	0.18	0.54

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	93	232	0	86	30	1135	119	30	1065	8
Future Volume (vph)	93	0	93	232	0	86	30	1135	119	30	1065	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	4.5		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	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3441		1785	3575	
Flt Permitted	0.70	1.00		0.70	1.00		0.22	1.00		0.16	1.00	
Satd. Flow (perm)	1292	1566		1223	1566		403	3441		303	3575	
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)	93	0	93	232	0	86	30	1135	119	30	1065	8
RTOR Reduction (vph)	0	46	0	0	45	0	0	10	0	0	0	0
Lane Group Flow (vph)	93	47	0	232	41	0	30	1244	0	30	1073	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	17.7	17.7		17.7	19.2		39.3	39.3		39.3	39.3	
Effective Green, g (s)	17.7	17.7		17.7	19.2		39.3	39.3		39.3	39.3	
Actuated g/C Ratio	0.25	0.25		0.25	0.27		0.56	0.56		0.56	0.56	
Clearance Time (s)	6.0	6.0		6.0	4.5		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)	326	395		309	429		226	1931		170	2007	
v/s Ratio Prot		0.03			0.03			c0.36			0.30	
v/s Ratio Perm	0.07			c0.19			0.07			0.10		
v/c Ratio	0.29	0.12		0.75	0.10		0.13	0.64		0.18	0.53	
Uniform Delay, d1	21.1	20.1		24.1	18.9		7.3	10.5		7.5	9.6	
Progression Factor	1.00	1.00		1.00	1.00		0.84	0.68		0.91	0.79	
Incremental Delay, d2	0.5	0.1		9.8	0.1		0.8	1.2		2.2	1.0	
Delay (s)	21.5	20.3		34.0	19.0		6.9	8.3		9.0	8.6	
Level of Service	C	C		C	B		A	A		A	A	
Approach Delay (s)		20.9			29.9			8.3			8.6	
Approach LOS		C			C			A			A	

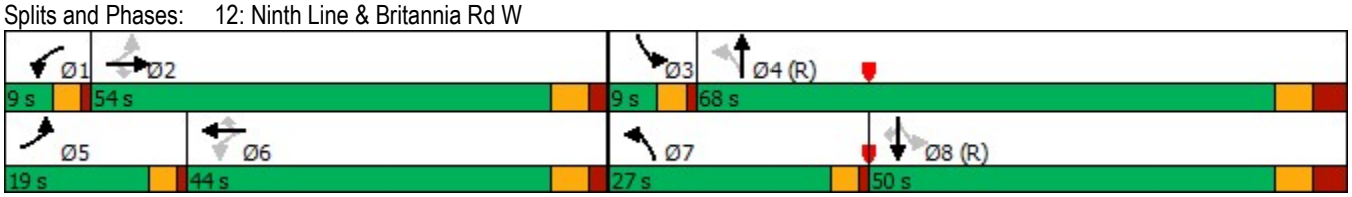
Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	227	1337	400	100	681	113	400	984	83	1001	168
Future Volume (vph)	227	1337	400	100	681	113	400	984	83	1001	168
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	3	8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	5	2	2	1	6	6	7	4	3	8	8
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	12.0	5.0	12.0	12.0
Minimum Split (s)	9.0	26.1	26.1	9.0	26.1	26.1	9.0	47.7	9.0	47.7	47.7
Total Split (s)	19.0	54.0	54.0	9.0	44.0	44.0	27.0	68.0	9.0	50.0	50.0
Total Split (%)	13.6%	38.6%	38.6%	6.4%	31.4%	31.4%	19.3%	48.6%	6.4%	35.7%	35.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.1	2.1	1.0	2.1	2.1	1.0	3.7	1.0	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7	4.0	7.7	7.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	59.0	47.9	47.9	45.5	38.4	38.4	73.0	60.3	51.0	42.3	42.3
Actuated g/C Ratio	0.42	0.34	0.34	0.32	0.27	0.27	0.52	0.43	0.36	0.30	0.30
v/c Ratio	0.78	1.07	0.59	0.84	0.69	0.21	1.15	0.76	0.54	0.93	0.29
Control Delay	46.7	90.6	20.8	80.2	49.8	2.3	135.0	41.0	33.9	63.3	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	90.6	20.8	80.2	49.8	2.3	135.0	41.0	33.9	63.3	12.1
LOS	D	F	C	F	D	A	F	D	C	E	B
Approach Delay		71.3			47.2			65.4		54.5	
Approach LOS		E			D			E		D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 88 (63%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 62.2	Intersection LOS: E
Intersection Capacity Utilization 110.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	227	1337	400	100	681	113	400	1138	83	1001	168
v/c Ratio	0.78	1.07	0.59	0.84	0.69	0.21	1.15	0.76	0.54	0.93	0.29
Control Delay	46.7	90.6	20.8	80.2	49.8	2.3	135.0	41.0	33.9	63.3	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	90.6	20.8	80.2	49.8	2.3	135.0	41.0	33.9	63.3	12.1
Queue Length 50th (m)	37.9	~198.4	38.6	15.5	82.5	0.0	~101.2	155.4	12.2	130.6	7.9
Queue Length 95th (m)	#61.3	#237.6	69.8	#40.7	102.5	4.0	#160.8	177.7	17.3	#168.8	18.2
Internal Link Dist (m)		80.1			420.4			341.1		608.8	
Turn Bay Length (m)	80.0		60.0	70.0		70.0	75.0		60.0		
Base Capacity (vph)	296	1248	681	119	991	534	347	1506	155	1081	581
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.07	0.59	0.84	0.69	0.21	1.15	0.76	0.54	0.93	0.29

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	1337	400	100	681	113	400	984	154	83	1001	168
Future Volume (vph)	227	1337	400	100	681	113	400	984	154	83	1001	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7		4.0	7.7	7.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1785	3650	1581	1767	3614	1521	1767	3476		1668	3579	1581
Flt Permitted	0.18	1.00	1.00	0.10	1.00	1.00	0.09	1.00		0.17	1.00	1.00
Satd. Flow (perm)	335	3650	1581	194	3614	1521	161	3476		293	3579	1581
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)	227	1337	400	100	681	113	400	984	154	83	1001	168
RTOR Reduction (vph)	0	0	140	0	0	82	0	9	0	0	0	104
Lane Group Flow (vph)	227	1337	260	100	681	31	400	1129	0	83	1001	64
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	56.9	47.9	47.9	43.4	38.4	38.4	69.3	60.3		47.3	42.3	42.3
Effective Green, g (s)	56.9	47.9	47.9	43.4	38.4	38.4	69.3	60.3		47.3	42.3	42.3
Actuated g/C Ratio	0.41	0.34	0.34	0.31	0.27	0.27	0.49	0.43		0.34	0.30	0.30
Clearance Time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7		4.0	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	286	1248	540	116	991	417	343	1497		148	1081	477
v/s Ratio Prot	c0.08	c0.37		0.03	0.19		c0.19	0.32		0.02	0.28	
v/s Ratio Perm	0.24		0.16	0.24		0.02	c0.39			0.17		0.04
v/c Ratio	0.79	1.07	0.48	0.86	0.69	0.07	1.17	0.75		0.56	0.93	0.13
Uniform Delay, d1	31.0	46.0	36.3	43.2	45.4	37.6	45.0	33.6		33.2	47.3	35.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.12	1.13		1.07	1.06	1.46
Incremental Delay, d2	14.0	46.9	3.1	44.0	3.9	0.3	98.9	3.1		4.2	13.0	0.5
Delay (s)	45.0	93.0	39.3	87.3	49.3	38.0	149.3	41.1		39.7	63.2	52.5
Level of Service	D	F	D	F	D	D	F	D		D	E	D
Approach Delay (s)		76.5			52.1			69.3			60.2	
Approach LOS		E			D			E			E	

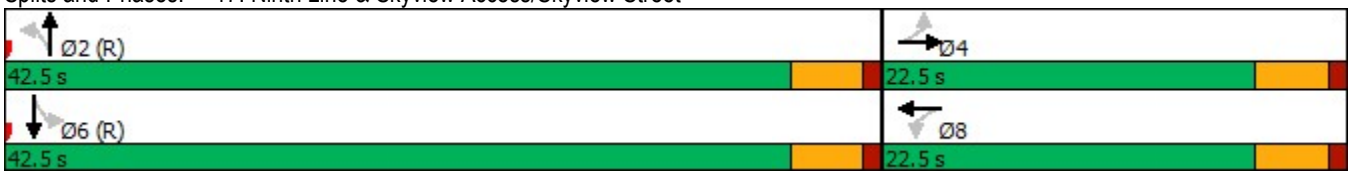
Intersection Summary			
HCM 2000 Control Delay	67.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.8
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	116	5	5	5	100	1081	2	1718
Future Volume (vph)	116	5	5	5	100	1081	2	1718
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	42.5	42.5	42.5	42.5
Total Split (%)	34.6%	34.6%	34.6%	34.6%	65.4%	65.4%	65.4%	65.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	15.2	15.2	15.2	15.2	40.8	40.8	40.8	40.8
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.63	0.63	0.63	0.63
v/c Ratio	0.36	0.76	0.03	0.04	0.88	0.49	0.01	0.80
Control Delay	23.2	34.6	18.0	11.6	86.7	21.1	8.0	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	34.6	18.0	11.6	86.7	21.1	8.0	11.9
LOS	C	C	B	B	F	C	A	B
Approach Delay		31.4		13.0		26.7		11.9
Approach LOS		C		B		C		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 17: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	290	5	17	100	1083	2	1760
v/c Ratio	0.36	0.76	0.03	0.04	0.88	0.49	0.01	0.80
Control Delay	23.2	34.6	18.0	11.6	86.7	21.1	8.0	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	34.6	18.0	11.6	86.7	21.1	8.0	11.9
Queue Length 50th (m)	10.5	27.2	0.4	0.4	20.7	118.4	0.1	44.5
Queue Length 95th (m)	21.3	47.4	2.4	3.9	m#32.6	m138.3	m0.2	#71.8
Internal Link Dist (m)		132.3		122.1		249.3		177.8
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	380	449	198	464	113	2198	254	2191
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	0.31	0.65	0.03	0.04	0.88	0.49	0.01	0.80

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	5	285	5	5	12	100	1081	2	2	1718	42
Future Volume (vph)	116	5	285	5	5	12	100	1081	2	2	1718	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1571		1750	1647		1750	3499		1750	3487	
Flt Permitted	0.75	1.00		0.39	1.00		0.10	1.00		0.22	1.00	
Satd. Flow (perm)	1375	1571		715	1647		181	3499		406	3487	
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)	116	5	285	5	5	12	100	1081	2	2	1718	42
RTOR Reduction (vph)	0	15	0	0	9	0	0	0	0	0	2	0
Lane Group Flow (vph)	116	275	0	5	8	0	100	1083	0	2	1758	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.2	15.2		15.2	15.2		40.8	40.8		40.8	40.8	
Effective Green, g (s)	15.2	15.2		15.2	15.2		40.8	40.8		40.8	40.8	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.63	0.63		0.63	0.63	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	321	367		167	385		113	2196		254	2188	
v/s Ratio Prot		c0.17			0.00			0.31			0.50	
v/s Ratio Perm	0.08			0.01			c0.55			0.00		
v/c Ratio	0.36	0.75		0.03	0.02		0.88	0.49		0.01	0.80	
Uniform Delay, d1	20.8	23.1		19.2	19.2		10.1	6.5		4.5	9.1	
Progression Factor	1.00	1.00		1.00	1.00		3.64	2.95		1.40	0.87	
Incremental Delay, d2	0.7	8.1		0.1	0.0		43.7	0.5		0.0	2.5	
Delay (s)	21.5	31.2		19.3	19.2		80.7	19.8		6.4	10.5	
Level of Service	C	C		B	B		F	B		A	B	
Approach Delay (s)		28.5			19.2			24.9			10.5	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	91	1406	26	1589
Future Volume (vph)	91	1406	26	1589
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.5	25.5	25.5
Total Split (s)	23.0	47.0	47.0	47.0
Total Split (%)	32.9%	67.1%	67.1%	67.1%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.8	52.8	52.8	52.8
Actuated g/C Ratio	0.14	0.75	0.75	0.75
v/c Ratio	0.49	0.56	0.12	0.59
Control Delay	26.3	2.6	2.6	5.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	2.6	2.6	5.4
LOS	C	A	A	A
Approach Delay	26.3	2.6		5.4
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 47 (67%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 5.0	Intersection LOS: A
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Ninth Line & McDowell Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	137	1487	26	1589
v/c Ratio	0.49	0.56	0.12	0.59
Control Delay	26.3	2.6	2.6	5.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	2.6	2.6	5.4
Queue Length 50th (m)	11.4	2.8	0.6	32.2
Queue Length 95th (m)	23.7	m8.0	m0.9	m172.6
Internal Link Dist (m)	322.0	187.3		341.1
Turn Bay Length (m)			25.0	
Base Capacity (vph)	503	2665	209	2699
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.56	0.12	0.59

Intersection Summary

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

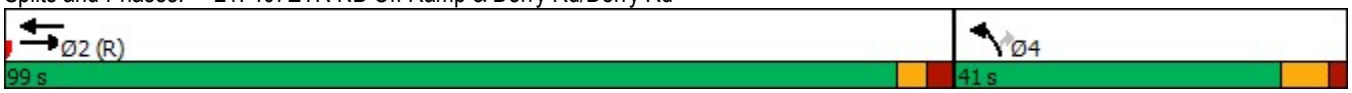
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	91	46	1406	81	26	1589
Future Volume (vph)	91	46	1406	81	26	1589
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1756		3529		1785	3579
Flt Permitted	0.97		1.00		0.15	1.00
Satd. Flow (perm)	1756		3529		278	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	91	46	1406	81	26	1589
RTOR Reduction (vph)	32	0	4	0	0	0
Lane Group Flow (vph)	105	0	1483	0	26	1589
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	8.4		50.6		50.6	50.6
Effective Green, g (s)	8.4		50.6		50.6	50.6
Actuated g/C Ratio	0.12		0.72		0.72	0.72
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	210		2550		200	2587
v/s Ratio Prot			0.42			c0.44
v/s Ratio Perm	c0.06				0.09	
v/c Ratio	0.50		0.58		0.13	0.61
Uniform Delay, d1	28.8		4.6		3.0	4.8
Progression Factor	1.00		0.41		0.42	0.89
Incremental Delay, d2	1.9		0.5		0.8	0.7
Delay (s)	30.7		2.3		2.1	5.0
Level of Service	C		A		A	A
Approach Delay (s)	30.7		2.3			5.0
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1769	1173	54	242
Future Volume (vph)	1769	1173	54	242
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	99.0	99.0	41.0	41.0
Total Split (%)	70.7%	70.7%	29.3%	29.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	93.0	93.0	34.0	34.0
Actuated g/C Ratio	0.66	0.66	0.24	0.24
v/c Ratio	0.74	0.50	0.08	0.62
Control Delay	18.1	12.8	41.4	49.3
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	18.4	12.8	41.4	49.3
LOS	B	B	D	D
Approach Delay	18.4	12.8	47.8	
Approach LOS	B	B	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1769	1173	54	242
v/c Ratio	0.74	0.50	0.08	0.62
Control Delay	18.1	12.8	41.4	49.3
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	18.4	12.8	41.4	49.3
Queue Length 50th (m)	146.8	73.8	5.5	48.7
Queue Length 95th (m)	171.5	88.1	10.8	75.8
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2377	2331	712	388
Starvation Cap Reductn	177	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.50	0.08	0.62

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1769	0	0	1173	54	242
Future Volume (vph)	1769	0	0	1173	54	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1769	0	0	1173	54	242
RTOR Reduction (vph)	0	0	0	0	0	23
Lane Group Flow (vph)	1769	0	0	1173	54	219
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	93.0			93.0	34.0	34.0
Effective Green, g (s)	93.0			93.0	34.0	34.0
Actuated g/C Ratio	0.66			0.66	0.24	0.24
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2377			2331	712	365
v/s Ratio Prot	c0.49			0.33	0.02	
v/s Ratio Perm						c0.15
v/c Ratio	0.74			0.50	0.08	0.60
Uniform Delay, d1	15.6			11.9	40.9	47.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	2.2			0.8	0.2	7.1
Delay (s)	17.8			12.6	41.1	54.1
Level of Service	B			B	D	D
Approach Delay (s)	17.8			12.6	51.7	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	208	183	1360	142	1522
Future Volume (vph)	208	183	1360	142	1522
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	25.5	25.5	27.5	9.5	27.5
Total Split (s)	26.0	26.0	34.0	10.0	44.0
Total Split (%)	37.1%	37.1%	48.6%	14.3%	62.9%
Yellow Time (s)	4.0	4.0	5.0	3.5	5.0
All-Red Time (s)	2.5	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.5	4.5	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.5	13.5	32.9	45.5	42.5
Actuated g/C Ratio	0.19	0.19	0.47	0.65	0.61
v/c Ratio	0.62	0.42	0.94	0.52	0.70
Control Delay	33.4	7.0	34.7	18.6	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	7.0	34.7	18.6	5.6
LOS	C	A	C	B	A
Approach Delay	21.1		34.7		6.7
Approach LOS	C		C		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 20 (29%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 20.3	Intersection LOS: C
Intersection Capacity Utilization 78.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	208	183	1553	142	1522
v/c Ratio	0.62	0.42	0.94	0.52	0.70
Control Delay	33.4	7.0	34.7	18.6	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	7.0	34.7	18.6	5.6
Queue Length 50th (m)	23.2	0.0	~101.3	9.5	16.3
Queue Length 95th (m)	37.3	12.1	#156.2	17.3	60.3
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	486	547	1645	275	2173
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.33	0.94	0.52	0.70

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.

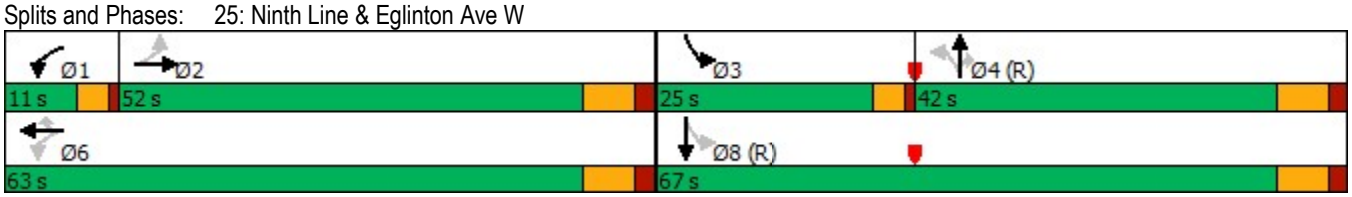
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	208	183	1360	193	142	1522
Future Volume (vph)	208	183	1360	193	142	1522
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.5		4.5	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1748	1493	3478		1653	3579
Flt Permitted	0.95	1.00	1.00		0.11	1.00
Satd. Flow (perm)	1748	1493	3478		191	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	208	183	1360	193	142	1522
RTOR Reduction (vph)	0	148	14	0	0	0
Lane Group Flow (vph)	208	35	1539	0	142	1522
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	13.5	13.5	31.9		42.5	42.5
Effective Green, g (s)	13.5	13.5	31.9		42.5	42.5
Actuated g/C Ratio	0.19	0.19	0.46		0.61	0.61
Clearance Time (s)	6.5	6.5	7.5		4.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	337	287	1584		243	2172
v/s Ratio Prot			c0.44		0.05	c0.43
v/s Ratio Perm	c0.12	0.02			0.30	
v/c Ratio	0.62	0.12	0.97		0.58	0.70
Uniform Delay, d1	25.9	23.4	18.6		12.9	9.4
Progression Factor	1.00	1.00	1.00		2.04	0.39
Incremental Delay, d2	3.3	0.2	16.8		2.9	1.6
Delay (s)	29.2	23.5	35.4		29.2	5.3
Level of Service	C	C	D		C	A
Approach Delay (s)	26.6		35.4			7.3
Approach LOS	C		D			A

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	38	612	99	264	256	28	856	150	400	1316
Future Volume (vph)	38	612	99	264	256	28	856	150	400	1316
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases		2	1	6			4		3	8
Permitted Phases	2		6		6	4		4	8	
Detector Phase	2	2	1	6	6	4	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	8.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.0	32.0	11.0	32.0	32.0	40.0	40.0	40.0	11.0	40.0
Total Split (s)	52.0	52.0	11.0	63.0	63.0	42.0	42.0	42.0	25.0	67.0
Total Split (%)	40.0%	40.0%	8.5%	48.5%	48.5%	32.3%	32.3%	32.3%	19.2%	51.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	4.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead	
Lead-Lag Optimize?										
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	45.0	45.0	59.0	56.0	56.0	35.0	35.0	35.0	63.0	60.0
Actuated g/C Ratio	0.35	0.35	0.45	0.43	0.43	0.27	0.27	0.27	0.48	0.46
v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.82	0.92	0.30	1.19	0.84
Control Delay	30.0	121.9	41.3	26.0	3.8	155.2	61.3	15.4	138.2	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	121.9	41.3	26.0	3.8	155.2	61.3	15.4	138.2	31.3
LOS	C	F	D	C	A	F	E	B	F	C
Approach Delay		117.4		19.3			57.2			55.2
Approach LOS		F		B			E			E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 88 (68%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 61.8	Intersection LOS: E
Intersection Capacity Utilization 113.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	735	99	264	256	28	856	150	400	1386
v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.82	0.92	0.30	1.19	0.84
Control Delay	30.0	121.9	41.3	26.0	3.8	155.2	61.3	15.4	138.2	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	121.9	41.3	26.0	3.8	155.2	61.3	15.4	138.2	31.3
Queue Length 50th (m)	6.1	~202.4	13.3	40.7	0.0	6.2	103.4	8.8	~96.6	135.1
Queue Length 95th (m)	13.7	#271.1	#29.2	60.1	14.2	#24.4	#136.7	24.8 m	#148.4	164.7
Internal Link Dist (m)		373.3		388.7			291.0			249.3
Turn Bay Length (m)	20.0		35.0			65.0		35.0	65.0	
Base Capacity (vph)	362	641	153	803	782	34	935	497	337	1642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	1.15	0.65	0.33	0.33	0.82	0.92	0.30	1.19	0.84

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Future Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		4.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1668	1834		1733	1865	1479	1069	3476	1574	1716	3555	
Flt Permitted	0.60	1.00		0.08	1.00	1.00	0.11	1.00	1.00	0.10	1.00	
Satd. Flow (perm)	1047	1834		149	1865	1479	129	3476	1574	185	3555	
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)	38	612	123	99	264	256	28	856	150	400	1316	70
RTOR Reduction (vph)	0	6	0	0	0	146	0	0	74	0	3	0
Lane Group Flow (vph)	38	729	0	99	264	110	28	856	76	400	1383	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4		4	8		
Actuated Green, G (s)	45.0	45.0		56.0	56.0	56.0	35.0	35.0	35.0	60.0	60.0	
Effective Green, g (s)	45.0	45.0		56.0	56.0	56.0	35.0	35.0	35.0	60.0	60.0	
Actuated g/C Ratio	0.35	0.35		0.43	0.43	0.43	0.27	0.27	0.27	0.46	0.46	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	362	634		149	803	637	34	935	423	332	1640	
v/s Ratio Prot		c0.40		c0.04	0.14			0.25		c0.19	0.39	
v/s Ratio Perm	0.04			0.25		0.07	0.22		0.05	c0.36		
v/c Ratio	0.10	1.15		0.66	0.33	0.17	0.82	0.92	0.18	1.20	0.84	
Uniform Delay, d1	28.8	42.5		30.6	24.5	22.8	44.6	46.1	36.5	40.1	30.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.12	0.89	
Incremental Delay, d2	0.6	84.8		10.6	1.1	0.6	105.9	15.0	0.9	108.5	3.4	
Delay (s)	29.4	127.3		41.2	25.6	23.3	150.5	61.0	37.4	153.5	30.9	
Level of Service	C	F		D	C	C	F	E	D	F	C	
Approach Delay (s)		122.5			27.2			60.0			58.4	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	66.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	113.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	48	1373	65	1639
Future Volume (vph)	48	1373	65	1639
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	22.5	24.0	24.0	24.0
Total Split (s)	23.0	42.0	42.0	42.0
Total Split (%)	35.4%	64.6%	64.6%	64.6%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.8	47.9	47.9	47.9
Actuated g/C Ratio	0.15	0.74	0.74	0.74
v/c Ratio	0.53	0.56	0.33	0.62
Control Delay	24.9	3.6	11.5	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.9	3.6	11.5	7.4
LOS	C	A	B	A
Approach Delay	24.9	3.6		7.6
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 28 (43%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 6.6	Intersection LOS: A
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	1448	65	1639
v/c Ratio	0.53	0.56	0.33	0.62
Control Delay	24.9	3.6	11.5	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.9	3.6	11.5	7.4
Queue Length 50th (m)	11.8	18.7	2.4	44.3
Queue Length 95th (m)	24.0	21.6	12.2	79.5
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	513	2585	195	2636
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.56	0.33	0.62

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	106	1373	75	65	1639
Future Volume (vph)	48	106	1373	75	65	1639
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.5		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1704		3506		1684	3579
Flt Permitted	0.98		1.00		0.15	1.00
Satd. Flow (perm)	1704		3506		267	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	106	1373	75	65	1639
RTOR Reduction (vph)	34	0	4	0	0	0
Lane Group Flow (vph)	120	0	1444	0	65	1639
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	8.7		45.8		45.8	45.8
Effective Green, g (s)	8.7		45.8		45.8	45.8
Actuated g/C Ratio	0.13		0.70		0.70	0.70
Clearance Time (s)	4.5		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	228		2470		188	2521
v/s Ratio Prot			0.41			c0.46
v/s Ratio Perm	c0.07				0.24	
v/c Ratio	0.53		0.58		0.35	0.65
Uniform Delay, d1	26.2		4.8		3.7	5.2
Progression Factor	1.00		0.52		1.00	1.00
Incremental Delay, d2	2.2		0.9		5.0	1.3
Delay (s)	28.4		3.4		8.7	6.5
Level of Service	C		A		A	A
Approach Delay (s)	28.4		3.4			6.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	145	82	1115	110	1685
Future Volume (vph)	145	82	1115	110	1685
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	22.5	22.5	22.0	9.0	22.0
Total Split (s)	23.0	23.0	33.0	9.0	42.0
Total Split (%)	35.4%	35.4%	50.8%	13.8%	64.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.9	10.9	37.0	46.5	45.7
Actuated g/C Ratio	0.17	0.17	0.57	0.72	0.70
v/c Ratio	0.49	0.24	0.61	0.32	0.67
Control Delay	29.8	7.9	31.8	8.2	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	7.9	31.8	8.2	5.3
LOS	C	A	C	A	A
Approach Delay	21.9		31.8		5.5
Approach LOS	C		C		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	145	82	1192	110	1685
v/c Ratio	0.49	0.24	0.61	0.32	0.67
Control Delay	29.8	7.9	31.8	8.2	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	7.9	31.8	8.2	5.3
Queue Length 50th (m)	14.9	0.0	130.1	2.3	24.5
Queue Length 95th (m)	26.7	8.4	137.7	m6.7	36.0
Internal Link Dist (m)	358.4		263.1		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	448	466	1950	347	2517
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.18	0.61	0.32	0.67

Intersection Summary

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

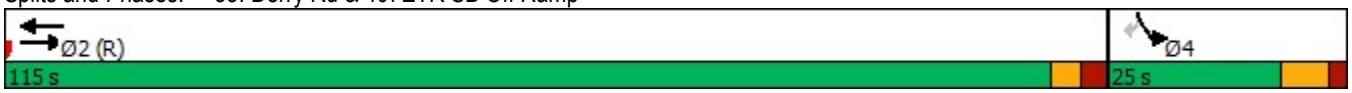
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	145	82	1115	77	110	1685
Future Volume (vph)	145	82	1115	77	110	1685
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3416		1785	3579
Flt Permitted	0.95	1.00	1.00		0.14	1.00
Satd. Flow (perm)	1765	1597	3416		271	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	82	1115	77	110	1685
RTOR Reduction (vph)	0	70	6	0	0	0
Lane Group Flow (vph)	145	12	1186	0	110	1685
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	9.3	9.3	33.7		43.2	43.2
Effective Green, g (s)	9.3	9.3	33.7		43.2	43.2
Actuated g/C Ratio	0.14	0.14	0.52		0.66	0.66
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	252	228	1771		308	2378
v/s Ratio Prot			0.35		0.03	c0.47
v/s Ratio Perm	c0.08	0.01			0.21	
v/c Ratio	0.58	0.05	0.67		0.36	0.71
Uniform Delay, d1	26.0	24.0	11.5		6.1	6.9
Progression Factor	1.00	1.00	2.40		1.42	0.51
Incremental Delay, d2	3.2	0.1	1.8		0.6	1.5
Delay (s)	29.2	24.1	29.6		9.3	5.0
Level of Service	C	C	C		A	A
Approach Delay (s)	27.4		29.6			5.3
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	2270	1010	54	46
Future Volume (vph)	2270	1010	54	46
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	115.0	115.0	25.0	25.0
Total Split (%)	82.1%	82.1%	17.9%	17.9%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	122.9	122.9	8.1	8.1
Actuated g/C Ratio	0.88	0.88	0.06	0.06
v/c Ratio	0.72	0.33	0.30	0.39
Control Delay	5.5	2.3	67.0	26.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	2.3	67.0	26.0
LOS	A	A	E	C
Approach Delay	5.5	2.3	48.1	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 79.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2270	1010	54	46
v/c Ratio	0.72	0.33	0.30	0.39
Control Delay	5.5	2.3	67.0	26.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	2.3	67.0	26.0
Queue Length 50th (m)	92.5	21.5	6.9	0.0
Queue Length 95th (m)	126.1	30.0	13.3	11.8
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	3171	3080	404	208
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.33	0.13	0.22

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2270	1010	0	54	46
Future Volume (vph)	0	2270	1010	0	54	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2270	1010	0	54	46
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	0	2270	1010	0	54	2
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		120.3	120.3		6.7	6.7
Effective Green, g (s)		120.3	120.3		6.7	6.7
Actuated g/C Ratio		0.86	0.86		0.05	0.05
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3105	3016		150	62
v/s Ratio Prot		c0.63	0.29		c0.02	
v/s Ratio Perm						0.00
v/c Ratio		0.73	0.33		0.36	0.04
Uniform Delay, d1		3.7	1.9		64.6	63.6
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.6	0.3		1.5	0.2
Delay (s)		5.3	2.2		66.1	63.8
Level of Service		A	A		E	E
Approach Delay (s)		5.3	2.2		65.0	
Approach LOS		A	A		E	

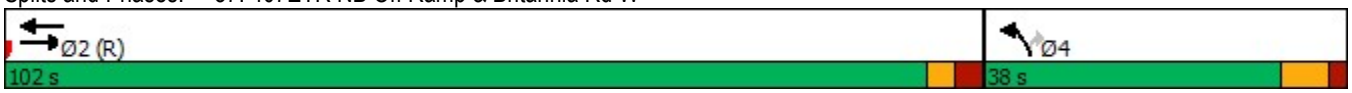
Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1807	1063	69	208
Future Volume (vph)	1807	1063	69	208
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	102.0	102.0	38.0	38.0
Total Split (%)	72.9%	72.9%	27.1%	27.1%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	105.6	105.6	21.4	21.4
Actuated g/C Ratio	0.75	0.75	0.15	0.15
v/c Ratio	0.66	0.39	0.28	0.78
Control Delay	10.7	7.1	53.4	68.1
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	11.1	7.1	53.4	68.1
LOS	B	A	D	E
Approach Delay	11.1	7.1	64.4	
Approach LOS	B	A	E	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1807	1063	69	208
v/c Ratio	0.66	0.39	0.28	0.78
Control Delay	10.7	7.1	53.4	68.1
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	11.1	7.1	53.4	68.1
Queue Length 50th (m)	105.1	44.0	15.8	44.3
Queue Length 95th (m)	158.4	67.9	27.3	65.6
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2726	2700	356	370
Starvation Cap Reductn	360	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.39	0.19	0.56

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1807	0	0	1063	69	208
Future Volume (vph)	1807	0	0	1063	69	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1807	0	0	1063	69	208
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	1807	0	0	1063	69	182
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	105.6			105.6	21.4	21.4
Effective Green, g (s)	105.6			105.6	21.4	21.4
Actuated g/C Ratio	0.75			0.75	0.15	0.15
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2725			2699	245	239
v/s Ratio Prot	c0.50			0.30	0.04	
v/s Ratio Perm						c0.12
v/c Ratio	0.66			0.39	0.28	0.76
Uniform Delay, d1	8.5			6.0	52.5	56.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.3			0.4	0.6	13.3
Delay (s)	9.7			6.4	53.1	70.1
Level of Service	A			A	D	E
Approach Delay (s)	9.7			6.4	65.9	
Approach LOS	A			A	E	

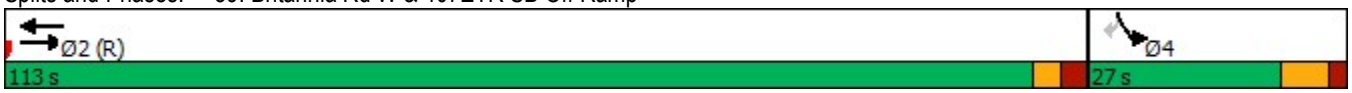
Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1993	996	70	63
Future Volume (vph)	1993	996	70	63
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	113.0	113.0	27.0	27.0
Total Split (%)	80.7%	80.7%	19.3%	19.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	115.8	115.8	11.2	11.2
Actuated g/C Ratio	0.83	0.83	0.08	0.08
v/c Ratio	0.67	0.34	0.52	0.41
Control Delay	6.3	3.4	74.6	21.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	3.4	74.6	21.3
LOS	A	A	E	C
Approach Delay	6.3	3.4	49.3	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1993	996	70	63
v/c Ratio	0.67	0.34	0.52	0.41
Control Delay	6.3	3.4	74.6	21.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	3.4	74.6	21.3
Queue Length 50th (m)	82.7	25.7	17.4	0.0
Queue Length 95th (m)	120.1	38.4	31.4	12.8
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2988	2959	240	226
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.34	0.29	0.28

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1993	996	0	70	63
Future Volume (vph)	0	1993	996	0	70	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1993	996	0	70	63
RTOR Reduction (vph)	0	0	0	0	0	58
Lane Group Flow (vph)	0	1993	996	0	70	5
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		115.8	115.8		11.2	11.2
Effective Green, g (s)		115.8	115.8		11.2	11.2
Actuated g/C Ratio		0.83	0.83		0.08	0.08
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2989	2960		134	96
v/s Ratio Prot		c0.55	0.28		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.67	0.34		0.52	0.05
Uniform Delay, d1		4.7	2.9		61.8	59.5
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.2	0.3		3.6	0.2
Delay (s)		5.9	3.2		65.5	59.7
Level of Service		A	A		E	E
Approach Delay (s)		5.9	3.2		62.8	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	5	42	46	5	68	10	1240	36	30	1116	39
Future Volume (Veh/h)	29	5	42	46	5	68	10	1240	36	30	1116	39
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)	29	5	42	46	5	68	10	1240	36	30	1116	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.78	0.78		0.78	0.78	0.78				0.78		
vC, conflicting volume	1906	2492	578	1940	2493	638	1155			1276		
vC1, stage 1 conf vol	1196	1196		1278	1278							
vC2, stage 2 conf vol	710	1296		662	1215							
vCu, unblocked vol	1590	2344	578	1634	2346	0	1155			777		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	97	91	78	97	92	98			95		
cM capacity (veh/h)	178	176	459	212	178	846	601			643		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	47	46	73	10	827	449	30	744	411
Volume Left	29	0	46	0	10	0	0	30	0	0
Volume Right	0	42	0	68	0	0	36	0	0	39
cSH	178	392	212	673	601	1700	1700	643	1700	1700
Volume to Capacity	0.16	0.12	0.22	0.11	0.02	0.49	0.26	0.05	0.44	0.24
Queue Length 95th (m)	4.0	2.8	5.6	2.5	0.4	0.0	0.0	1.0	0.0	0.0
Control Delay (s)	29.1	15.4	26.6	11.0	11.1	0.0	0.0	10.9	0.0	0.0
Lane LOS	D	C	D	B	B			B		
Approach Delay (s)	20.7		17.0		0.1			0.3		
Approach LOS	C		C							

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	38	11	1161	1821	6
Future Volume (Veh/h)	21	38	11	1161	1821	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)	21	38	11	1161	1821	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				202	287	
pX, platoon unblocked	0.71	0.63	0.63			
vC, conflicting volume	2426	914	1827			
vC1, stage 1 conf vol	1824					
vC2, stage 2 conf vol	602					
vCu, unblocked vol	1176	0	1142			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	94	97			
cM capacity (veh/h)	165	685	384			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	21	38	11	580	580	1214	613
Volume Left	21	0	11	0	0	0	0
Volume Right	0	38	0	0	0	0	6
cSH	165	685	384	1700	1700	1700	1700
Volume to Capacity	0.13	0.06	0.03	0.34	0.34	0.71	0.36
Queue Length 95th (m)	3.0	1.2	0.6	0.0	0.0	0.0	0.0
Control Delay (s)	30.0	10.6	14.7	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	17.5		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	8	2	1557	1073	18
Future Volume (Veh/h)	20	8	2	1557	1073	18
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)	20	8	2	1557	1073	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				397	203	
pX, platoon unblocked	0.69	0.89	0.89			
vC, conflicting volume	1864	546	1091			
vC1, stage 1 conf vol	1082					
vC2, stage 2 conf vol	782					
vCu, unblocked vol	673	253	863			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	328	667	692			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	20	8	521	1038	715	376
Volume Left	20	0	2	0	0	0
Volume Right	0	8	0	0	0	18
cSH	328	667	692	1700	1700	1700
Volume to Capacity	0.06	0.01	0.00	0.61	0.42	0.22
Queue Length 95th (m)	1.4	0.3	0.1	0.0	0.0	0.0
Control Delay (s)	16.7	10.5	0.1	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	14.9		0.0		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	15	9	1401	1079	16
Future Volume (Veh/h)	42	15	9	1401	1079	16
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)	42	15	9	1401	1079	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					384	
pX, platoon unblocked	0.89	0.89	0.89			
vC, conflicting volume	1806	548	1095			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1663	255	867			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	46	98	99			
cM capacity (veh/h)	77	665	690			

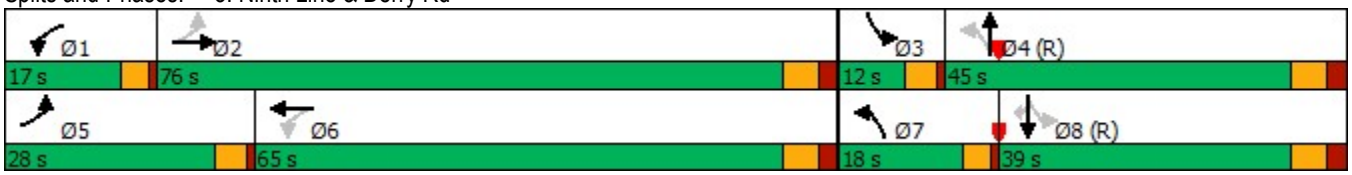
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	15	9	700	700	719	376
Volume Left	42	0	9	0	0	0	0
Volume Right	0	15	0	0	0	0	16
cSH	77	665	690	1700	1700	1700	1700
Volume to Capacity	0.54	0.02	0.01	0.41	0.41	0.42	0.22
Queue Length 95th (m)	16.3	0.5	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	96.6	10.5	10.3	0.0	0.0	0.0	0.0
Lane LOS	F	B	B				
Approach Delay (s)	73.9		0.1			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	367	722	165	1608	246	831	56	761	400
Future Volume (vph)	367	722	165	1608	246	831	56	761	400
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7	4	3	8	
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	1	6	7	4	3	8	8
Switch Phase									
Minimum Initial (s)	7.0	8.0	7.0	8.0	7.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.5	30.1	11.0	30.1	11.0	29.4	11.5	29.4	29.4
Total Split (s)	28.0	76.0	17.0	65.0	18.0	45.0	12.0	39.0	39.0
Total Split (%)	18.7%	50.7%	11.3%	43.3%	12.0%	30.0%	8.0%	26.0%	26.0%
Yellow Time (s)	3.5	4.0	3.0	4.0	3.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	2.1	1.0	2.1	1.0	2.4	1.0	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.1	4.0	6.1	4.0	6.4	4.5	6.4	6.4
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	Max	None	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	88.5	71.5	72.4	58.9	53.0	41.0	41.9	32.6	32.6
Actuated g/C Ratio	0.59	0.48	0.48	0.39	0.35	0.27	0.28	0.22	0.22
v/c Ratio	1.18	0.67	0.64	1.20	1.14	1.00	0.41	0.97	0.74
Control Delay	148.8	29.8	28.1	138.4	148.8	73.1	42.8	83.2	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.8	29.8	28.1	138.4	148.8	73.1	42.8	83.2	28.7
LOS	F	C	C	F	F	E	D	F	C
Approach Delay		59.2		128.4		88.4		63.4	
Approach LOS		E		F		F		E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 88.2	Intersection LOS: F
Intersection Capacity Utilization 118.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	367	1122	165	1653	246	971	56	761	400
v/c Ratio	1.18	0.67	0.64	1.20	1.14	1.00	0.41	0.97	0.74
Control Delay	148.8	29.8	28.1	138.4	148.8	73.1	42.8	83.2	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.8	29.8	28.1	138.4	148.8	73.1	42.8	83.2	28.7
Queue Length 50th (m)	~106.0	113.2	19.5	~289.5	~65.0	~152.7	10.3	109.9	38.7
Queue Length 95th (m)	#164.7	137.5	30.1	#329.0	#116.4	#188.2	19.7	#147.1	75.9
Internal Link Dist (m)		119.7		244.5		681.0		237.0	
Turn Bay Length (m)	75.0		80.0		130.0		95.0		80.0
Base Capacity (vph)	312	1686	275	1374	215	973	136	785	541
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.67	0.60	1.20	1.14	1.00	0.41	0.97	0.74

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
Future Volume (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.5	6.1		4.0	6.1		4.0	6.4		4.5	6.4	6.4
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.95		1.00	1.00		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1684	3433		1733	3497		1750	3531		1716	3614	1581
Flt Permitted	0.06	1.00		0.17	1.00		0.11	1.00		0.12	1.00	1.00
Satd. Flow (perm)	112	3433		309	3497		201	3531		222	3614	1581
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)	367	722	400	165	1608	45	246	831	140	56	761	400
RTOR Reduction (vph)	0	49	0	0	1	0	0	9	0	0	0	198
Lane Group Flow (vph)	367	1073	0	165	1652	0	246	962	0	56	761	202
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	86.9	71.5		70.3	58.9		50.6	40.1		38.6	32.6	32.6
Effective Green, g (s)	86.9	71.5		70.3	58.9		50.6	40.1		38.6	32.6	32.6
Actuated g/C Ratio	0.58	0.48		0.47	0.39		0.34	0.27		0.26	0.22	0.22
Clearance Time (s)	4.5	6.1		4.0	6.1		4.0	6.4		4.5	6.4	6.4
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)	311	1636		253	1373		212	943		116	785	343
v/s Ratio Prot	c0.18	0.31		0.05	0.47		c0.11	0.27		0.02	0.21	
v/s Ratio Perm	c0.50			0.26			c0.28			0.10		0.13
v/c Ratio	1.18	0.66		0.65	1.20		1.16	1.02		0.48	0.97	0.59
Uniform Delay, d1	51.6	29.9		25.4	45.5		42.7	54.9		45.6	58.2	52.7
Progression Factor	1.00	1.00		1.00	1.00		1.38	0.86		1.00	1.00	1.00
Incremental Delay, d2	109.2	2.1		5.9	98.6		108.8	33.0		3.1	25.5	7.2
Delay (s)	160.7	31.9		31.3	144.1		167.7	80.0		48.7	83.7	59.9
Level of Service	F	C		C	F		F	F		D	F	E
Approach Delay (s)		63.7			133.9			97.8			74.3	
Approach LOS		E			F			F			E	

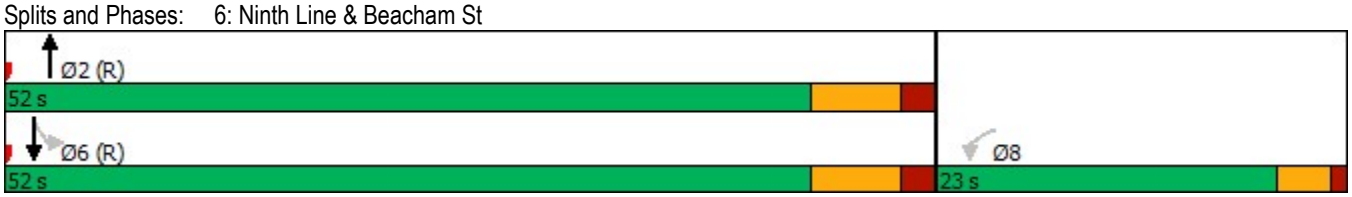
Intersection Summary			
HCM 2000 Control Delay	95.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	118.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	131	1082	81	1357
Future Volume (vph)	131	1082	81	1357
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	52.0	52.0	52.0
Total Split (%)	30.7%	69.3%	69.3%	69.3%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.7	51.3	51.3	51.3
Actuated g/C Ratio	0.17	0.68	0.68	0.68
v/c Ratio	0.64	0.49	0.30	0.56
Control Delay	31.9	4.5	4.4	3.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.9	4.5	4.4	3.7
LOS	C	A	A	A
Approach Delay	31.9	4.5		3.7
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 39 (52%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	1192	81	1357
v/c Ratio	0.64	0.49	0.30	0.56
Control Delay	31.9	4.5	4.4	3.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.9	4.5	4.4	3.7
Queue Length 50th (m)	20.9	9.2	2.1	23.1
Queue Length 95th (m)	36.3	13.8	m3.9	m34.2
Internal Link Dist (m)	168.5	178.7		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	473	2420	270	2423
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.49	0.30	0.56

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	131	80	1082	110	81	1357
Future Volume (vph)	131	80	1082	110	81	1357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1754		3529		1785	3544
Flt Permitted	0.97		1.00		0.21	1.00
Satd. Flow (perm)	1754		3529		395	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	80	1082	110	81	1357
RTOR Reduction (vph)	32	0	8	0	0	0
Lane Group Flow (vph)	179	0	1184	0	81	1357
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.7		51.3		51.3	51.3
Effective Green, g (s)	12.7		51.3		51.3	51.3
Actuated g/C Ratio	0.17		0.68		0.68	0.68
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	297		2413		270	2424
v/s Ratio Prot			0.34			c0.38
v/s Ratio Perm	c0.10				0.20	
v/c Ratio	0.60		0.49		0.30	0.56
Uniform Delay, d1	28.8		5.6		4.7	6.1
Progression Factor	1.00		0.63		0.43	0.46
Incremental Delay, d2	3.4		0.6		1.8	0.6
Delay (s)	32.2		4.2		3.8	3.4
Level of Service	C		A		A	A
Approach Delay (s)	32.2		4.2			3.4
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	79	8	147	13	52	1059	157	1404
Future Volume (vph)	79	8	147	13	52	1059	157	1404
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		6		2
Permitted Phases	4		8		6		2	
Detector Phase	4	4	8	8	6	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	24.5	24.5	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	50.0	50.0	50.0	50.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.4	13.4	13.4	13.4	48.1	48.1	48.1	48.1
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.64	0.64	0.64	0.64
v/c Ratio	0.35	0.13	0.62	0.33	0.34	0.52	0.64	0.64
Control Delay	30.0	11.7	39.1	10.9	15.3	8.7	19.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	11.7	39.1	10.9	15.3	8.7	19.2	4.8
LOS	C	B	D	B	B	A	B	A
Approach Delay		23.8		26.5		9.0		6.2
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	79	40	147	119	52	1169	157	1457
v/c Ratio	0.35	0.13	0.62	0.33	0.34	0.52	0.64	0.64
Control Delay	30.0	11.7	39.1	10.9	15.3	8.7	19.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	11.7	39.1	10.9	15.3	8.7	19.2	4.8
Queue Length 50th (m)	9.1	0.9	17.9	2.8	2.7	36.6	6.7	25.8
Queue Length 95th (m)	18.3	7.1	31.3	13.3	12.2	60.8	#46.0	24.4
Internal Link Dist (m)		131.2		392.7		51.3		372.4
Turn Bay Length (m)			25.0		20.0		80.0	
Base Capacity (vph)	309	423	328	467	155	2267	244	2286
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	0.26	0.09	0.45	0.25	0.34	0.52	0.64	0.64

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	8	32	147	13	106	52	1059	110	157	1404	53
Future Volume (vph)	79	8	32	147	13	106	52	1059	110	157	1404	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		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	0.95	
Frt	1.00	0.88		1.00	0.87		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1621		1733	1610		1750	3522		1750	3559	
Flt Permitted	0.68	1.00		0.73	1.00		0.13	1.00		0.21	1.00	
Satd. Flow (perm)	1254	1621		1333	1610		244	3522		381	3559	
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)	79	8	32	147	13	106	52	1059	110	157	1404	53
RTOR Reduction (vph)	0	26	0	0	77	0	0	9	0	0	3	0
Lane Group Flow (vph)	79	14	0	147	42	0	52	1160	0	157	1454	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	13.4	13.4		13.4	13.4		48.1	48.1		48.1	48.1	
Effective Green, g (s)	13.4	13.4		13.4	13.4		48.1	48.1		48.1	48.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.64	0.64		0.64	0.64	
Clearance Time (s)	6.5	6.5		6.5	6.5		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)	224	289		238	287		156	2258		244	2282	
v/s Ratio Prot		0.01			0.03			0.33			0.41	
v/s Ratio Perm	0.06			c0.11			0.21			c0.41		
v/c Ratio	0.35	0.05		0.62	0.15		0.33	0.51		0.64	0.64	
Uniform Delay, d1	27.0	25.5		28.4	26.0		6.1	7.2		8.2	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.67	0.41	
Incremental Delay, d2	1.0	0.1		4.7	0.2		5.7	0.8		11.0	1.2	
Delay (s)	28.0	25.6		33.1	26.2		11.8	8.0		16.6	4.5	
Level of Service	C	C		C	C		B	A		B	A	
Approach Delay (s)		27.2			30.0			8.2			5.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	0	270	0	92	1305	45	1308
Future Volume (vph)	55	0	270	0	92	1305	45	1308
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	23.0	23.0	24.0	24.0	23.0	23.0	23.0	23.0
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	19.6	19.6	19.6	19.6	47.4	47.4	47.4	47.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.59	0.59	0.59	0.59
v/c Ratio	0.17	0.13	0.87	0.08	0.58	0.73	0.38	0.63
Control Delay	24.4	7.8	57.4	3.6	18.6	9.6	20.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	7.8	57.4	3.6	18.6	9.6	20.7	12.6
LOS	C	A	E	A	B	A	C	B
Approach Delay		16.1		51.7		10.2		12.9
Approach LOS		B		D		B		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 61 (76%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	55	270	32	92	1488	45	1332
v/c Ratio	0.17	0.13	0.87	0.08	0.58	0.73	0.38	0.63
Control Delay	24.4	7.8	57.4	3.6	18.6	9.6	20.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	7.8	57.4	3.6	18.6	9.6	20.7	12.6
Queue Length 50th (m)	5.9	0.0	35.4	0.0	8.1	69.2	3.2	60.7
Queue Length 95th (m)	13.9	7.3	#70.9	3.2	m13.0	m97.4	12.3	79.3
Internal Link Dist (m)		114.7		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	355	451	332	451	159	2040	120	2115
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.12	0.81	0.07	0.58	0.73	0.38	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	55	270	0	32	92	1305	183	45	1308	24
Future Volume (vph)	55	0	55	270	0	32	92	1305	183	45	1308	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		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	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3421		1785	3569	
Flt Permitted	0.74	1.00		0.72	1.00		0.15	1.00		0.11	1.00	
Satd. Flow (perm)	1356	1566		1266	1566		268	3421		204	3569	
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	0	55	270	0	32	92	1305	183	45	1308	24
RTOR Reduction (vph)	0	42	0	0	24	0	0	13	0	0	2	0
Lane Group Flow (vph)	55	13	0	270	8	0	92	1475	0	45	1330	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.6	19.6		19.6	19.6		47.4	47.4		47.4	47.4	
Effective Green, g (s)	19.6	19.6		19.6	19.6		47.4	47.4		47.4	47.4	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.59	0.59		0.59	0.59	
Clearance Time (s)	6.0	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	3.0	
Lane Grp Cap (vph)	332	383		310	383		158	2026		120	2114	
v/s Ratio Prot		0.01			0.01			c0.43			0.37	
v/s Ratio Perm	0.04			c0.21			0.34			0.22		
v/c Ratio	0.17	0.04		0.87	0.02		0.58	0.73		0.38	0.63	
Uniform Delay, d1	23.8	23.0		29.0	22.9		10.1	11.7		8.5	10.6	
Progression Factor	1.00	1.00		1.00	1.00		0.85	0.71		1.00	1.00	
Incremental Delay, d2	0.2	0.0		22.4	0.0		8.1	1.2		8.7	1.4	
Delay (s)	24.0	23.0		51.4	22.9		16.7	9.5		17.3	12.0	
Level of Service	C	C		D	C		B	A		B	B	
Approach Delay (s)		23.5			48.4			9.9			12.2	
Approach LOS		C			D			A			B	

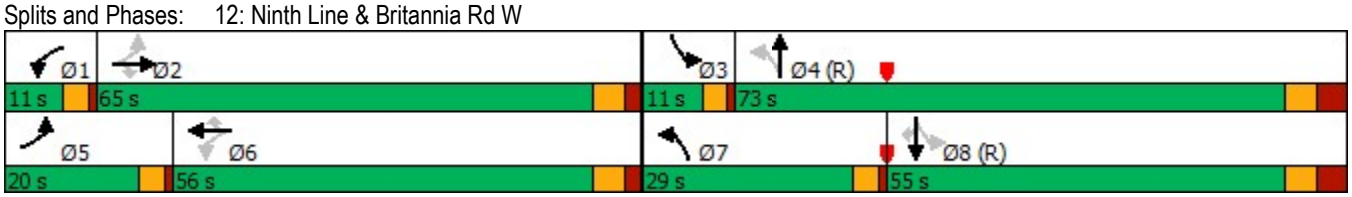
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	288	729	400	92	1299	101	400	1113	90	1061	369
Future Volume (vph)	288	729	400	92	1299	101	400	1113	90	1061	369
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	3	8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	5	2	2	1	6	6	7	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0	12.0
Minimum Split (s)	11.0	26.1	26.1	11.0	26.1	26.1	11.0	47.7	11.0	47.7	47.7
Total Split (s)	20.0	65.0	65.0	11.0	56.0	56.0	29.0	73.0	11.0	55.0	55.0
Total Split (%)	12.5%	40.6%	40.6%	6.9%	35.0%	35.0%	18.1%	45.6%	6.9%	34.4%	34.4%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.1	2.1	1.0	2.1	2.1	1.0	3.7	1.0	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7	4.0	7.7	7.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	72.0	58.9	58.9	59.0	49.9	49.9	80.0	65.3	58.0	47.3	47.3
Actuated g/C Ratio	0.45	0.37	0.37	0.37	0.31	0.31	0.50	0.41	0.36	0.30	0.30
v/c Ratio	1.27	0.54	0.50	0.37	1.15	0.18	1.23	0.83	0.67	1.00	0.63
Control Delay	188.7	41.8	7.8	31.2	127.3	2.3	157.8	50.8	54.3	85.8	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	188.7	41.8	7.8	31.2	127.3	2.3	157.8	50.8	54.3	85.8	35.7
LOS	F	D	A	C	F	A	F	D	D	F	D
Approach Delay		62.0			112.9			77.6		71.8	
Approach LOS		E			F			E		E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 41 (26%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 81.2	Intersection LOS: F
Intersection Capacity Utilization 121.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	288	729	400	92	1299	101	400	1196	90	1061	369
v/c Ratio	1.27	0.54	0.50	0.37	1.15	0.18	1.23	0.83	0.67	1.00	0.63
Control Delay	188.7	41.8	7.8	31.2	127.3	2.3	157.8	50.8	54.3	85.8	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	188.7	41.8	7.8	31.2	127.3	2.3	157.8	50.8	54.3	85.8	35.7
Queue Length 50th (m)	~91.2	88.6	9.0	15.5	~234.8	0.0	~129.0	164.9	13.9	~168.4	64.3
Queue Length 95th (m)	#146.5	107.2	33.8	26.2	#274.2	4.1	#188.9	198.6	m#24.9	#211.6	m96.2
Internal Link Dist (m)		80.1			420.4			341.1		608.8	
Turn Bay Length (m)	80.0		60.0	70.0		70.0	75.0		60.0		
Base Capacity (vph)	227	1343	805	247	1127	571	325	1436	134	1058	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.54	0.50	0.37	1.15	0.18	1.23	0.83	0.67	1.00	0.63

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	729	400	92	1299	101	400	1113	83	90	1061	369
Future Volume (vph)	288	729	400	92	1299	101	400	1113	83	90	1061	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7		4.0	7.7	7.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1785	3650	1581	1767	3614	1521	1767	3509		1668	3579	1581
Flt Permitted	0.07	1.00	1.00	0.28	1.00	1.00	0.08	1.00		0.11	1.00	1.00
Satd. Flow (perm)	139	3650	1581	525	3614	1521	145	3509		193	3579	1581
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)	288	729	400	92	1299	101	400	1113	83	90	1061	369
RTOR Reduction (vph)	0	0	223	0	0	70	0	4	0	0	0	123
Lane Group Flow (vph)	288	729	177	92	1299	31	400	1192	0	90	1061	246
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	69.9	58.9	58.9	56.9	49.9	49.9	76.3	65.3		54.3	47.3	47.3
Effective Green, g (s)	69.9	58.9	58.9	56.9	49.9	49.9	76.3	65.3		54.3	47.3	47.3
Actuated g/C Ratio	0.44	0.37	0.37	0.36	0.31	0.31	0.48	0.41		0.34	0.30	0.30
Clearance Time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7		4.0	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	225	1343	582	241	1127	474	322	1432		130	1058	467
v/s Ratio Prot	c0.13	0.20		0.02	0.36		c0.19	0.34		0.03	0.30	
v/s Ratio Perm	c0.43		0.11	0.12		0.02	c0.40			0.20		0.16
v/c Ratio	1.28	0.54	0.30	0.38	1.15	0.07	1.24	0.83		0.69	1.00	0.53
Uniform Delay, d1	51.1	39.9	36.0	35.6	55.1	38.7	53.3	42.5		39.4	56.4	47.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.10		1.41	1.11	1.28
Incremental Delay, d2	155.6	1.6	1.3	1.0	79.1	0.3	124.9	3.8		11.5	24.8	3.2
Delay (s)	206.7	41.5	37.3	36.6	134.2	39.0	172.2	50.6		67.0	87.2	63.3
Level of Service	F	D	D	D	F	D	F	D		E	F	E
Approach Delay (s)		73.9			121.7			81.1			80.2	
Approach LOS		E			F			F			F	

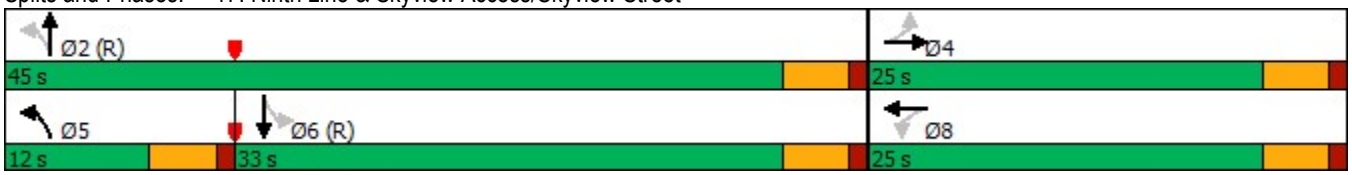
Intersection Summary			
HCM 2000 Control Delay	89.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.8
Intersection Capacity Utilization	121.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	78	5	4	5	293	1724	14	1377
Future Volume (vph)	78	5	4	5	293	1724	14	1377
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	9.5	24.0	24.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	12.0	45.0	33.0	33.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	17.1%	64.3%	47.1%	47.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.3	9.3	9.3	9.3	51.7	51.7	32.8	32.8
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.74	0.74	0.47	0.47
v/c Ratio	0.42	0.52	0.04	0.04	0.63	0.67	0.12	0.92
Control Delay	34.0	10.3	25.0	20.1	16.2	12.3	19.9	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	16.2	12.3	19.9	34.1
LOS	C	B	C	C	B	B	B	C
Approach Delay		17.1		21.6		12.9		34.0
Approach LOS		B		C		B		C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	78	194	4	9	293	1729	14	1497
v/c Ratio	0.42	0.52	0.04	0.04	0.63	0.67	0.12	0.92
Control Delay	34.0	10.3	25.0	20.1	16.2	12.3	19.9	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	16.2	12.3	19.9	34.1
Queue Length 50th (m)	8.8	0.5	0.4	0.6	27.3	176.0	1.4	111.5
Queue Length 95th (m)	18.4	14.4	2.5	3.6	m27.1	m180.6	m2.6	#157.8
Internal Link Dist (m)		104.9		106.4		253.8		165.7
Turn Bay Length (m)					15.0		15.0	
Base Capacity (vph)	405	594	238	506	465	2584	117	1626
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.33	0.02	0.02	0.63	0.67	0.12	0.92

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	5	189	4	5	4	293	1724	5	14	1377	120
Future Volume (vph)	78	5	189	4	5	4	293	1724	5	14	1377	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1573		1750	1719		1750	3498		1750	3458	
Flt Permitted	0.75	1.00		0.44	1.00		0.11	1.00		0.14	1.00	
Satd. Flow (perm)	1385	1573		814	1719		198	3498		253	3458	
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)	78	5	189	4	5	4	293	1724	5	14	1377	120
RTOR Reduction (vph)	0	164	0	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	78	30	0	4	6	0	293	1729	0	14	1488	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.3	9.3		9.3	9.3		51.7	51.7		32.8	32.8	
Effective Green, g (s)	9.3	9.3		9.3	9.3		51.7	51.7		32.8	32.8	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.47	0.47	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	208		108	228		465	2583		118	1620	
v/s Ratio Prot		0.02			0.00		0.13	c0.49			c0.43	
v/s Ratio Perm	c0.06			0.00			0.34			0.06		
v/c Ratio	0.42	0.14		0.04	0.02		0.63	0.67		0.12	0.92	
Uniform Delay, d1	27.9	26.8		26.4	26.4		15.3	4.7		10.5	17.4	
Progression Factor	1.00	1.00		1.00	1.00		1.21	2.22		1.40	1.36	
Incremental Delay, d2	1.6	0.3		0.1	0.0		1.4	0.7		1.8	8.9	
Delay (s)	29.5	27.2		26.6	26.4		19.9	11.2		16.4	32.5	
Level of Service	C	C		C	C		B	B		B	C	
Approach Delay (s)		27.8			26.5			12.5			32.4	
Approach LOS		C			C			B			C	

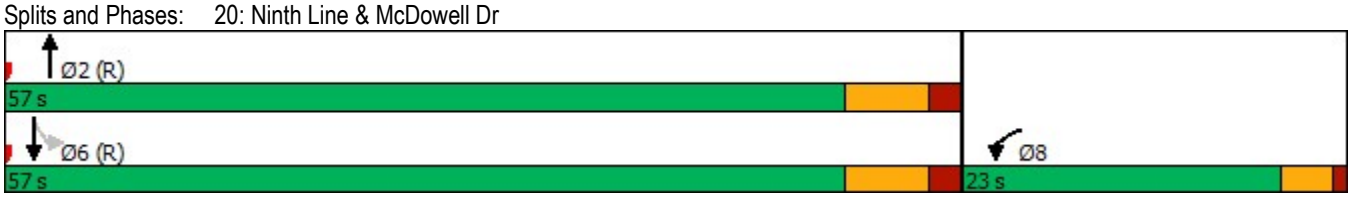
Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	117	1697	26	1441
Future Volume (vph)	117	1697	26	1441
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	57.0	57.0	57.0
Total Split (%)	28.8%	71.3%	71.3%	71.3%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.1	56.9	56.9	56.9
Actuated g/C Ratio	0.15	0.71	0.71	0.71
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	6.9	4.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	6.9	4.8
LOS	C	B	A	A
Approach Delay	34.9	10.7		4.9
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 60 (75%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 20: Ninth Line & McDowell Dr



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	176	1902	26	1441
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	6.9	4.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	6.9	4.8
Queue Length 50th (m)	19.5	71.7	0.5	25.6
Queue Length 95th (m)	34.3	125.0	m0.9	m33.6
Internal Link Dist (m)	322.0	187.3		341.1
Turn Bay Length (m)			25.0	
Base Capacity (vph)	438	2484	94	2545
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.77	0.28	0.57

Intersection Summary

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

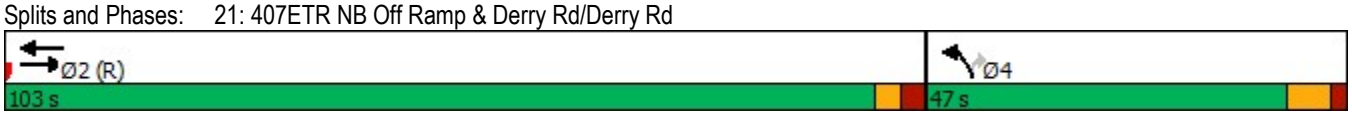
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	117	59	1697	205	26	1441
Future Volume (vph)	117	59	1697	205	26	1441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.98		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1757		3480		1785	3579
Flt Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1757		3480		133	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	59	1697	205	26	1441
RTOR Reduction (vph)	24	0	9	0	0	0
Lane Group Flow (vph)	152	0	1893	0	26	1441
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	12.1		56.9		56.9	56.9
Effective Green, g (s)	12.1		56.9		56.9	56.9
Actuated g/C Ratio	0.15		0.71		0.71	0.71
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	265		2475		94	2545
v/s Ratio Prot	c0.09		c0.54			0.40
v/s Ratio Perm					0.20	
v/c Ratio	0.57		0.76		0.28	0.57
Uniform Delay, d1	31.6		7.3		4.2	5.6
Progression Factor	1.00		1.00		0.50	0.72
Incremental Delay, d2	3.0		2.3		3.8	0.5
Delay (s)	34.6		9.6		5.8	4.5
Level of Service	C		A		A	A
Approach Delay (s)	34.6		9.6			4.5
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1157	2189	67	498
Future Volume (vph)	1157	2189	67	498
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	103.0	103.0	47.0	47.0
Total Split (%)	68.7%	68.7%	31.3%	31.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	98.5	98.5	42.5	42.5
Actuated g/C Ratio	0.66	0.66	0.28	0.28
v/c Ratio	0.49	0.95	0.08	0.99
Control Delay	13.9	34.1	39.9	79.9
Queue Delay	0.0	40.9	0.0	0.0
Total Delay	13.9	75.1	39.9	79.9
LOS	B	E	D	E
Approach Delay	13.9	75.1	75.1	
Approach LOS	B	E	E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 57.0	Intersection LOS: E
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1157	2189	67	498
v/c Ratio	0.49	0.95	0.08	0.99
Control Delay	13.9	34.1	39.9	79.9
Queue Delay	0.0	40.9	0.0	0.0
Total Delay	13.9	75.1	39.9	79.9
Queue Length 50th (m)	79.7	270.9	7.0	113.8
Queue Length 95th (m)	93.7	#316.1	12.7	#182.3
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2350	2304	831	502
Starvation Cap Reductn	0	301	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	1.09	0.08	0.99

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1157	0	0	2189	67	498
Future Volume (vph)	1157	0	0	2189	67	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1157	0	0	2189	67	498
RTOR Reduction (vph)	0	0	0	0	0	76
Lane Group Flow (vph)	1157	0	0	2189	67	422
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	97.0			97.0	40.0	40.0
Effective Green, g (s)	98.5			98.5	42.5	42.5
Actuated g/C Ratio	0.66			0.66	0.28	0.28
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2350			2304	831	426
v/s Ratio Prot	0.32			c0.62	0.02	
v/s Ratio Perm						c0.28
v/c Ratio	0.49			0.95	0.08	0.99
Uniform Delay, d1	13.1			23.5	39.4	53.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			10.2	0.2	41.4
Delay (s)	13.8			33.7	39.6	94.9
Level of Service	B			C	D	F
Approach Delay (s)	13.8			33.7	88.4	
Approach LOS	B			C	F	

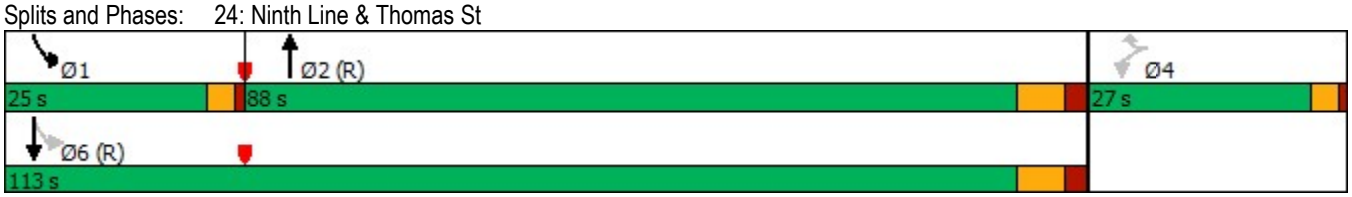
Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	178	322	1680	237	1313
Future Volume (vph)	178	322	1680	237	1313
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	27.0	27.0	88.0	25.0	113.0
Total Split (%)	19.3%	19.3%	62.9%	17.9%	80.7%
Yellow Time (s)	3.0	3.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	7.5	4.0	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	18.8	18.8	87.0	113.2	109.7
Actuated g/C Ratio	0.13	0.13	0.62	0.81	0.78
v/c Ratio	0.76	0.79	0.85	0.87	0.47
Control Delay	78.4	29.4	15.8	70.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	29.4	15.8	70.1	6.1
LOS	E	C	B	E	A
Approach Delay	46.9		15.8		15.9
Approach LOS	D		B		B

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 29 (21%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	178	322	1842	237	1313
v/c Ratio	0.76	0.79	0.85	0.87	0.47
Control Delay	78.4	29.4	15.8	70.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	29.4	15.8	70.1	6.1
Queue Length 50th (m)	44.1	19.2	133.5	44.8	53.0
Queue Length 95th (m)	66.0	51.4	162.2	#82.8	71.5
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	286	447	2177	300	2804
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.72	0.85	0.79	0.47

Intersection Summary

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

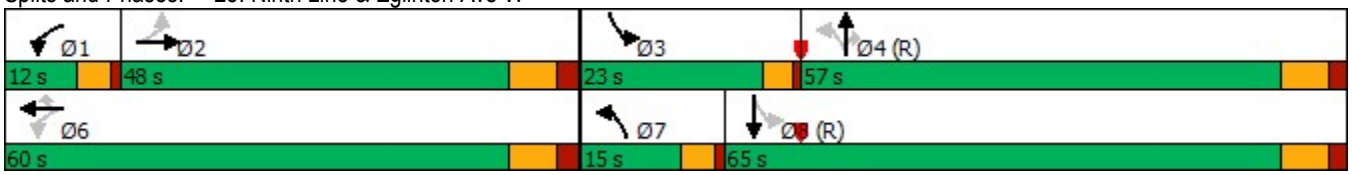
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	178	322	1680	162	237	1313
Future Volume (vph)	178	322	1680	162	237	1313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0	4.0	7.5		4.0	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1746	1493	3497		1653	3579
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	1746	1493	3497		76	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	178	322	1680	162	237	1313
RTOR Reduction (vph)	0	210	5	0	0	0
Lane Group Flow (vph)	178	112	1837	0	237	1313
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	18.8	18.8	87.0		109.7	109.7
Effective Green, g (s)	18.8	18.8	87.0		109.7	109.7
Actuated g/C Ratio	0.13	0.13	0.62		0.78	0.78
Clearance Time (s)	4.0	4.0	7.5		4.0	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	200	2173		270	2804
v/s Ratio Prot			0.53		c0.12	0.37
v/s Ratio Perm	c0.10	0.08			c0.57	
v/c Ratio	0.76	0.56	0.85		0.88	0.47
Uniform Delay, d1	58.4	56.7	21.1		47.8	5.2
Progression Factor	1.00	1.00	0.56		1.00	1.00
Incremental Delay, d2	13.6	3.6	2.8		25.8	0.6
Delay (s)	72.0	60.3	14.5		73.6	5.7
Level of Service	E	E	B		E	A
Approach Delay (s)	64.5		14.5			16.1
Approach LOS	E		B			B

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	54	562	154	728	538	110	1244	208	374	1042
Future Volume (vph)	54	562	154	728	538	110	1244	208	374	1042
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	1	6		7	4		3	8
Permitted Phases	2		6		6	4		4	8	
Detector Phase	2	2	1	6	6	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.5	32.5	11.5	32.5	32.5	11.5	40.0	40.0	11.0	40.0
Total Split (s)	48.0	48.0	12.0	60.0	60.0	15.0	57.0	57.0	23.0	65.0
Total Split (%)	34.3%	34.3%	8.6%	42.9%	42.9%	10.7%	40.7%	40.7%	16.4%	46.4%
Yellow Time (s)	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	1.0	2.5	2.5	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.5	7.5	7.5	4.5	7.0	10.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	40.5	40.5	55.5	52.5	52.5	62.9	50.0	47.0	76.0	58.1
Actuated g/C Ratio	0.29	0.29	0.40	0.38	0.38	0.45	0.36	0.34	0.54	0.42
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.00	0.34	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	70.8	13.9	191.5	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	70.8	13.9	191.5	39.8
LOS	F	F	F	F	C	E	E	B	F	D
Approach Delay		135.9		68.0			62.5			78.5
Approach LOS		F		E			E			E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 20 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 78.3	Intersection LOS: E
Intersection Capacity Utilization 121.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	54	622	154	728	538	110	1244	208	374	1091
v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.80	1.00	0.34	1.30	0.74
Control Delay	199.3	130.4	117.4	87.7	27.3	60.2	70.8	13.9	191.5	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.3	130.4	117.4	87.7	27.3	60.2	70.8	13.9	191.5	39.8
Queue Length 50th (m)	~15.3	~185.5	~27.1	~200.2	66.6	13.9	~167.2	12.8	~105.3	152.6
Queue Length 95th (m)	#41.7	#252.6	#69.0	#268.9	110.6	#40.9	#212.5	31.1	m#132.9	m165.4
Internal Link Dist (m)		373.3		388.7			291.0			253.8
Turn Bay Length (m)	20.0		35.0			65.0		35.0	65.0	
Base Capacity (vph)	50	542	148	699	712	139	1241	618	287	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.15	1.04	1.04	0.76	0.79	1.00	0.34	1.30	0.74

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Future Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0	10.0	4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1668	1863		1733	1865	1479	1069	3476	1574	1716	3558	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.14	1.00	1.00	0.07	1.00	
Satd. Flow (perm)	173	1863		162	1865	1479	157	3476	1574	134	3558	
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)	54	562	60	154	728	538	110	1244	208	374	1042	49
RTOR Reduction (vph)	0	3	0	0	0	158	0	0	90	0	2	0
Lane Group Flow (vph)	54	619	0	154	728	381	110	1244	118	374	1089	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4		4	8		
Actuated Green, G (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0	50.0	73.0	58.1	
Effective Green, g (s)	40.5	40.5		52.5	52.5	52.5	60.4	50.0	47.0	73.0	58.1	
Actuated g/C Ratio	0.29	0.29		0.38	0.38	0.38	0.43	0.36	0.34	0.52	0.42	
Clearance Time (s)	7.5	7.5		4.5	7.5	7.5	4.5	7.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	50	538		144	699	554	135	1241	528	284	1476	
v/s Ratio Prot		c0.33		0.06	c0.39		0.06	0.36		c0.18	0.31	
v/s Ratio Perm	0.31			0.34		0.26	0.29		0.07	c0.51		
v/c Ratio	1.08	1.15		1.07	1.04	0.69	0.81	1.00	0.22	1.32	0.74	
Uniform Delay, d1	49.8	49.8		37.8	43.8	36.8	28.3	45.0	33.4	46.1	34.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.34	1.10	
Incremental Delay, d2	151.5	87.7		94.7	45.3	6.8	30.0	26.1	1.0	154.8	1.7	
Delay (s)	201.2	137.4		132.6	89.1	43.6	58.3	71.1	34.4	216.7	39.5	
Level of Service	F	F		F	F	D	E	E	C	F	D	
Approach Delay (s)		142.5			76.6			65.3			84.7	
Approach LOS		F			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	84.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	121.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	97	1751	65	1460
Future Volume (vph)	97	1751	65	1460
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	47.0	47.0	47.0
Total Split (%)	32.9%	67.1%	67.1%	67.1%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.3	46.7	46.7	46.7
Actuated g/C Ratio	0.18	0.67	0.67	0.67
v/c Ratio	0.60	0.78	0.64	0.61
Control Delay	31.4	3.5	37.3	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	3.5	37.3	5.8
LOS	C	A	D	A
Approach Delay	31.4	3.5		7.1
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 34 (49%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 6.6	Intersection LOS: A
Intersection Capacity Utilization 74.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	1826	65	1460
v/c Ratio	0.60	0.78	0.64	0.61
Control Delay	31.4	3.5	37.3	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	3.5	37.3	5.8
Queue Length 50th (m)	19.4	2.9	3.1	35.8
Queue Length 95th (m)	33.5	m17.1	m#38.5	53.2
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	484	2348	101	2388
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.78	0.64	0.61

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.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	97	94	1751	75	65	1460
Future Volume (vph)	97	94	1751	75	65	1460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.93		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1740		3514		1684	3579
Flt Permitted	0.98		1.00		0.09	1.00
Satd. Flow (perm)	1740		3514		152	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	94	1751	75	65	1460
RTOR Reduction (vph)	14	0	3	0	0	0
Lane Group Flow (vph)	177	0	1823	0	65	1460
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.3		46.7		46.7	46.7
Effective Green, g (s)	12.3		46.7		46.7	46.7
Actuated g/C Ratio	0.18		0.67		0.67	0.67
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	305		2344		101	2387
v/s Ratio Prot			c0.52			0.41
v/s Ratio Perm	c0.10				0.43	
v/c Ratio	0.58		0.78		0.64	0.61
Uniform Delay, d1	26.5		8.1		6.8	6.6
Progression Factor	1.00		0.26		0.83	0.66
Incremental Delay, d2	2.8		1.2		24.9	1.1
Delay (s)	29.3		3.3		30.5	5.4
Level of Service	C		A		C	A
Approach Delay (s)	29.3		3.3			6.5
Approach LOS	C		A			A

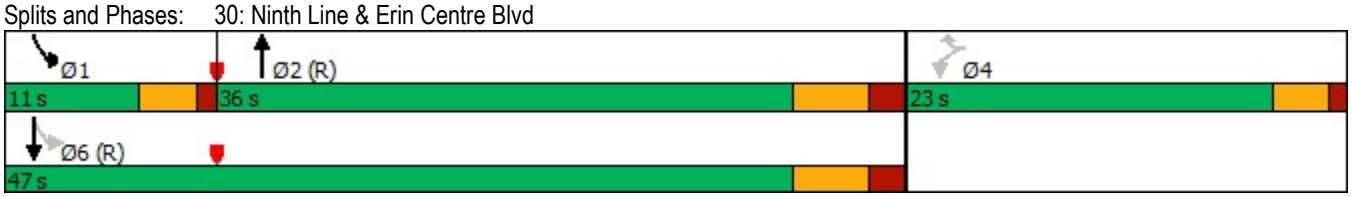
Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	132	158	1688	143	1361
Future Volume (vph)	132	158	1688	143	1361
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	23.0	23.0	36.0	11.0	47.0
Total Split (%)	32.9%	32.9%	51.4%	15.7%	67.1%
Yellow Time (s)	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.6	10.6	39.8	51.4	49.4
Actuated g/C Ratio	0.15	0.15	0.57	0.73	0.71
v/c Ratio	0.49	0.42	0.93	0.47	0.54
Control Delay	32.9	8.4	29.7	17.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	8.4	29.7	17.0	4.8
LOS	C	A	C	B	A
Approach Delay	19.5		29.7		6.0
Approach LOS	B		C		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 68 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 19.0	Intersection LOS: B
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	132	158	1813	143	1361
v/c Ratio	0.49	0.42	0.93	0.47	0.54
Control Delay	32.9	8.4	29.7	17.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	8.4	29.7	17.0	4.8
Queue Length 50th (m)	14.8	0.0	161.1	9.5	20.5
Queue Length 95th (m)	26.8	12.1	#280.5	22.3	46.4
Internal Link Dist (m)	358.4		270.9		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	479	548	1944	307	2523
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.29	0.93	0.47	0.54

Intersection Summary

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

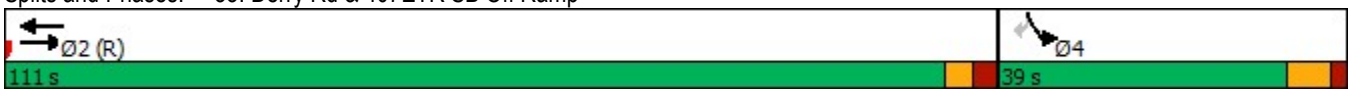
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	132	158	1688	125	143	1361
Future Volume (vph)	132	158	1688	125	143	1361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0	4.0	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3409		1785	3579
Flt Permitted	0.95	1.00	1.00		0.09	1.00
Satd. Flow (perm)	1765	1597	3409		175	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	132	158	1688	125	143	1361
RTOR Reduction (vph)	0	134	6	0	0	0
Lane Group Flow (vph)	132	24	1807	0	143	1361
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	10.6	10.6	39.0		49.4	49.4
Effective Green, g (s)	10.6	10.6	39.0		49.4	49.4
Actuated g/C Ratio	0.15	0.15	0.56		0.71	0.71
Clearance Time (s)	4.0	4.0	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	267	241	1899		270	2525
v/s Ratio Prot			c0.53		0.05	c0.38
v/s Ratio Perm	c0.07	0.01			0.32	
v/c Ratio	0.49	0.10	0.95		0.53	0.54
Uniform Delay, d1	27.2	25.6	14.6		12.9	4.9
Progression Factor	1.00	1.00	1.36		2.80	0.79
Incremental Delay, d2	1.4	0.2	9.9		1.5	0.7
Delay (s)	28.7	25.8	29.9		37.6	4.5
Level of Service	C	C	C		D	A
Approach Delay (s)	27.1		29.9			7.7
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1330	2156	361	219
Future Volume (vph)	1330	2156	361	219
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	111.0	111.0	39.0	39.0
Total Split (%)	74.0%	74.0%	26.0%	26.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	111.5	111.5	29.5	29.5
Actuated g/C Ratio	0.74	0.74	0.20	0.20
v/c Ratio	0.50	0.83	0.58	0.81
Control Delay	9.1	17.4	58.0	75.0
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	9.1	18.7	58.0	75.0
LOS	A	B	E	E
Approach Delay	9.1	18.7	64.4	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1330	2156	361	219
v/c Ratio	0.50	0.83	0.58	0.81
Control Delay	9.1	17.4	58.0	75.0
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	9.1	18.7	58.0	75.0
Queue Length 50th (m)	73.5	195.1	46.1	53.0
Queue Length 95th (m)	94.3	249.2	59.6	79.3
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	2686	2609	724	314
Starvation Cap Reductn	0	242	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.91	0.50	0.70

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1330	2156	0	361	219
Future Volume (vph)	0	1330	2156	0	361	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1330	2156	0	361	219
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	0	1330	2156	0	361	205
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		110.0	110.0		27.0	27.0
Effective Green, g (s)		111.5	111.5		29.5	29.5
Actuated g/C Ratio		0.74	0.74		0.20	0.20
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2686	2609		619	257
v/s Ratio Prot		0.37	c0.61		0.11	
v/s Ratio Perm						c0.16
v/c Ratio		0.50	0.83		0.58	0.80
Uniform Delay, d1		7.8	12.8		54.7	57.4
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.7	3.2		1.4	15.8
Delay (s)		8.5	16.0		56.1	73.2
Level of Service		A	B		E	E
Approach Delay (s)		8.5	16.0		62.5	
Approach LOS		A	B		E	

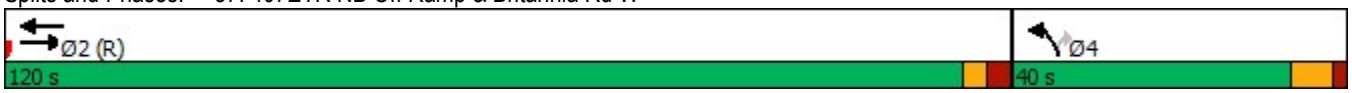
Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1439	1974	197	118
Future Volume (vph)	1439	1974	197	118
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	120.0	120.0	40.0	40.0
Total Split (%)	75.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	123.7	123.7	27.3	27.3
Actuated g/C Ratio	0.77	0.77	0.17	0.17
v/c Ratio	0.52	0.71	0.72	0.36
Control Delay	8.2	11.8	76.9	24.1
Queue Delay	0.3	2.8	0.0	0.0
Total Delay	8.5	14.6	76.9	24.1
LOS	A	B	E	C
Approach Delay	8.5	14.6	57.1	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 73.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1439	1974	197	118
v/c Ratio	0.52	0.71	0.72	0.36
Control Delay	8.2	11.8	76.9	24.1
Queue Delay	0.3	2.8	0.0	0.0
Total Delay	8.5	14.6	76.9	24.1
Queue Length 50th (m)	74.4	137.0	55.3	10.4
Queue Length 95th (m)	108.4	197.8	76.8	26.6
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2793	2766	356	407
Starvation Cap Reductn	622	652	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.93	0.55	0.29

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1439	0	0	1974	197	118
Future Volume (vph)	1439	0	0	1974	197	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1439	0	0	1974	197	118
RTOR Reduction (vph)	0	0	0	0	0	64
Lane Group Flow (vph)	1439	0	0	1974	197	54
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	122.2			122.2	24.8	24.8
Effective Green, g (s)	123.7			123.7	27.3	27.3
Actuated g/C Ratio	0.77			0.77	0.17	0.17
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2794			2767	274	267
v/s Ratio Prot	0.40			c0.55	c0.12	
v/s Ratio Perm						0.03
v/c Ratio	0.52			0.71	0.72	0.20
Uniform Delay, d1	6.8			9.2	62.7	57.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			1.6	8.7	0.4
Delay (s)	7.5			10.8	71.4	57.4
Level of Service	A			B	E	E
Approach Delay (s)	7.5			10.8	66.2	
Approach LOS	A			B	E	

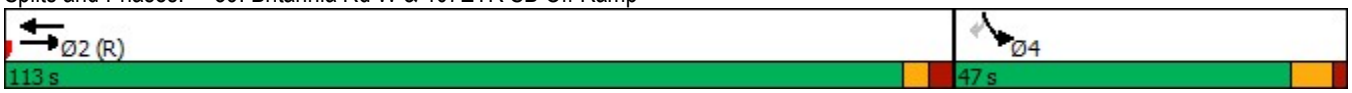
Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1451	2054	164	224
Future Volume (vph)	1451	2054	164	224
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	113.0	113.0	47.0	47.0
Total Split (%)	70.6%	70.6%	29.4%	29.4%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	116.6	116.6	34.4	34.4
Actuated g/C Ratio	0.73	0.73	0.22	0.22
v/c Ratio	0.55	0.79	0.45	0.82
Control Delay	11.6	17.9	57.4	77.3
Queue Delay	0.0	1.5	0.0	0.0
Total Delay	11.6	19.4	57.4	77.3
LOS	B	B	E	E
Approach Delay	11.6	19.4	68.9	
Approach LOS	B	B	E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1451	2054	164	224
v/c Ratio	0.55	0.79	0.45	0.82
Control Delay	11.6	17.9	57.4	77.3
Queue Delay	0.0	1.5	0.0	0.0
Total Delay	11.6	19.4	57.4	77.3
Queue Length 50th (m)	95.2	189.7	41.9	58.1
Queue Length 95th (m)	129.8	255.8	60.1	83.7
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2634	2609	447	334
Starvation Cap Reductn	0	350	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.91	0.37	0.67

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1451	2054	0	164	224
Future Volume (vph)	0	1451	2054	0	164	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1451	2054	0	164	224
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	0	1451	2054	0	164	210
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		115.1	115.1		31.9	31.9
Effective Green, g (s)		116.6	116.6		34.4	34.4
Actuated g/C Ratio		0.73	0.73		0.21	0.21
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2633	2608		362	260
v/s Ratio Prot		0.40	c0.57		0.10	
v/s Ratio Perm						c0.17
v/c Ratio		0.55	0.79		0.45	0.81
Uniform Delay, d1		9.8	13.8		54.6	59.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8	2.5		0.9	16.6
Delay (s)		10.7	16.3		55.5	76.2
Level of Service		B	B		E	E
Approach Delay (s)		10.7	16.3		67.5	
Approach LOS		B	B		E	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	25	22	0	17	32	1312	61	43	1334	120
Future Volume (Veh/h)	18	0	25	22	0	17	32	1312	61	43	1334	120
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)	18	0	25	22	0	17	32	1312	61	43	1334	120
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.71	0.71		0.71	0.71	0.71				0.71		
vC, conflicting volume	2217	2917	727	2184	2946	686	1454			1373		
vC1, stage 1 conf vol	1480	1480		1406	1406							
vC2, stage 2 conf vol	737	1437		778	1540							
vCu, unblocked vol	1893	2883	727	1848	2924	0	1454			701		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	93	88	100	98	93			93		
cM capacity (veh/h)	118	129	366	180	113	772	461			627		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	18	25	22	17	32	875	498	43	889	565
Volume Left	18	0	22	0	32	0	0	43	0	0
Volume Right	0	25	0	17	0	0	61	0	0	120
cSH	118	366	180	772	461	1700	1700	627	1700	1700
Volume to Capacity	0.15	0.07	0.12	0.02	0.07	0.51	0.29	0.07	0.52	0.33
Queue Length 95th (m)	3.6	1.5	2.9	0.5	1.6	0.0	0.0	1.5	0.0	0.0
Control Delay (s)	41.1	15.5	27.8	9.8	13.4	0.0	0.0	11.2	0.0	0.0
Lane LOS	E	C	D	A	B			B		
Approach Delay (s)	26.2		19.9		0.3			0.3		
Approach LOS	D		C							

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	22	38	1819	1474	20
Future Volume (Veh/h)	12	22	38	1819	1474	20
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	22	38	1819	1474	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				190	295	
pX, platoon unblocked	0.80	0.80	0.80			
vC, conflicting volume	2470	747	1494			
vC1, stage 1 conf vol	1484					
vC2, stage 2 conf vol	986					
vCu, unblocked vol	1217	180	1115			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	92			
cM capacity (veh/h)	215	665	497			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	22	38	910	910	983	511
Volume Left	12	0	38	0	0	0	0
Volume Right	0	22	0	0	0	0	20
cSH	215	665	497	1700	1700	1700	1700
Volume to Capacity	0.06	0.03	0.08	0.54	0.54	0.58	0.30
Queue Length 95th (m)	1.2	0.7	1.7	0.0	0.0	0.0	0.0
Control Delay (s)	22.8	10.6	12.8	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	14.9		0.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	5	8	1178	1515	57
Future Volume (Veh/h)	12	5	8	1178	1515	57
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	5	8	1178	1515	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				397	203	
pX, platoon unblocked	0.85	0.79	0.79			
vC, conflicting volume	2148	786	1572			
vC1, stage 1 conf vol	1544					
vC2, stage 2 conf vol	605					
vCu, unblocked vol	1329	190	1188			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	98			
cM capacity (veh/h)	201	646	460			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	12	5	401	785	1010	562
Volume Left	12	0	8	0	0	0
Volume Right	0	5	0	0	0	57
cSH	201	646	460	1700	1700	1700
Volume to Capacity	0.06	0.01	0.02	0.46	0.59	0.33
Queue Length 95th (m)	1.3	0.2	0.4	0.0	0.0	0.0
Control Delay (s)	24.1	10.6	0.5	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	20.1		0.2		0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	15	28	1236	1456	48
Future Volume (Veh/h)	25	15	28	1236	1456	48
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)	25	15	28	1236	1456	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					384	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	2154	752	1504			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1873	5	1007			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	45	98	95			
cM capacity (veh/h)	45	808	513			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	25	15	28	618	618	971	533
Volume Left	25	0	28	0	0	0	0
Volume Right	0	15	0	0	0	0	48
cSH	45	808	513	1700	1700	1700	1700
Volume to Capacity	0.55	0.02	0.05	0.36	0.36	0.57	0.31
Queue Length 95th (m)	14.4	0.4	1.2	0.0	0.0	0.0	0.0
Control Delay (s)	157.8	9.5	12.4	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	102.2		0.3			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
Future Volume (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2		2	6		6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	11.5	30.1	30.1	11.0	30.1	30.1	11.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	35.0	64.0	64.0	11.0	40.0	40.0	31.0	65.0	65.0	34.0	34.0	34.0
Total Split (%)	25.0%	45.7%	45.7%	7.9%	28.6%	28.6%	22.1%	46.4%	46.4%	24.3%	24.3%	24.3%
Yellow Time (s)	3.5	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.1	2.1	1.0	2.1	2.1	1.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.1	6.1	4.0	6.1	6.1	4.0	6.4	6.4	6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	70.5	57.9	57.9	46.3	37.2	37.2	61.0	58.6	58.6	27.6	27.6	27.6
Actuated g/C Ratio	0.50	0.41	0.41	0.33	0.27	0.27	0.44	0.42	0.42	0.20	0.20	0.20
v/c Ratio	0.88	0.98	0.28	0.86	0.62	0.09	1.02	0.57	0.33	0.20	0.92	0.63
Control Delay	46.9	60.1	15.9	77.8	49.5	0.3	89.3	29.2	12.2	52.0	74.3	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	60.1	15.9	77.8	49.5	0.3	89.3	29.2	12.2	52.0	74.3	10.4
LOS	D	E	B	E	D	A	F	C	B	D	E	B
Approach Delay		53.3			51.2			42.5			50.5	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 31 (22%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 49.4	Intersection LOS: D
Intersection Capacity Utilization 104.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
v/c Ratio	0.88	0.98	0.28	0.86	0.62	0.09	1.02	0.57	0.33	0.20	0.92	0.63
Control Delay	46.9	60.1	15.9	77.8	49.5	0.3	89.3	29.2	12.2	52.0	74.3	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	60.1	15.9	77.8	49.5	0.3	89.3	29.2	12.2	52.0	74.3	10.4
Queue Length 50th (m)	64.8	192.7	17.8	17.2	70.8	0.0	~93.6	84.9	22.2	5.0	87.3	2.3
Queue Length 95th (m)	#110.3	#240.2	34.5	#51.1	90.2	0.0	#154.4	99.9	40.2	13.0	#118.8	29.9
Internal Link Dist (m)		119.7			244.5			681.0			237.0	
Turn Bay Length (m)	75.0		45.0	80.0			130.0		45.0	95.0		80.0
Base Capacity (vph)	483	1494	712	142	931	507	394	1512	733	117	712	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.98	0.28	0.86	0.62	0.09	1.02	0.57	0.33	0.20	0.92	0.63

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
Future Volume (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.5	6.1	6.1	4.0	6.1	6.1	4.0	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	3614	1597	1733	3510	1566	1750	3614	1566	1716	3614	1581
Flt Permitted	0.23	1.00	1.00	0.11	1.00	1.00	0.13	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	410	3614	1597	196	3510	1566	233	3614	1566	596	3614	1581
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	1469	201	122	581	44	400	858	241	23	656	391
RTOR Reduction (vph)	0	0	52	0	0	32	0	0	78	0	0	305
Lane Group Flow (vph)	400	1469	149	122	581	12	400	858	163	23	656	86
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2		2	6		6	4		4	8		8
Actuated Green, G (s)	68.9	57.9	57.9	44.2	37.2	37.2	58.6	58.6	58.6	27.6	27.6	27.6
Effective Green, g (s)	68.9	57.9	57.9	44.2	37.2	37.2	58.6	58.6	58.6	27.6	27.6	27.6
Actuated g/C Ratio	0.49	0.41	0.41	0.32	0.27	0.27	0.42	0.42	0.42	0.20	0.20	0.20
Clearance Time (s)	4.5	6.1	6.1	4.0	6.1	6.1	4.0	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	449	1494	660	138	932	416	390	1512	655	117	712	311
v/s Ratio Prot	c0.17	c0.41		0.04	0.17		c0.20	0.24			0.18	
v/s Ratio Perm	0.27		0.09	0.23		0.01	c0.23		0.10	0.04		0.05
v/c Ratio	0.89	0.98	0.23	0.88	0.62	0.03	1.03	0.57	0.25	0.20	0.92	0.28
Uniform Delay, d1	26.5	40.6	26.5	40.3	45.2	38.0	43.2	31.0	26.4	46.9	55.1	47.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.16	0.89	0.96	1.00	1.00	1.00
Incremental Delay, d2	19.3	19.6	0.8	43.7	3.1	0.1	47.0	1.2	0.7	3.7	19.2	2.2
Delay (s)	45.8	60.2	27.3	84.1	48.4	38.2	97.1	28.9	26.0	50.7	74.3	49.9
Level of Service	D	E	C	F	D	D	F	C	C	D	E	D
Approach Delay (s)		54.2			53.6			46.6			64.9	
Approach LOS		D			D			D			E	

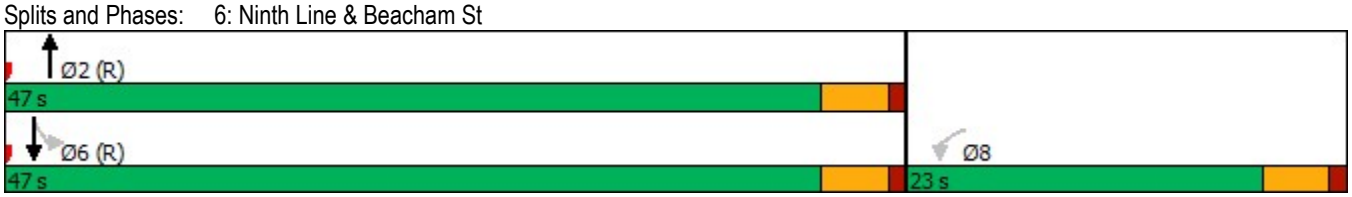
Intersection Summary			
HCM 2000 Control Delay	54.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	130	1423	90	946
Future Volume (vph)	130	1423	90	946
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	23.0	47.0	47.0	47.0
Total Split (%)	32.9%	67.1%	67.1%	67.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.5	48.5	48.5	48.5
Actuated g/C Ratio	0.18	0.69	0.69	0.69
v/c Ratio	0.64	0.63	0.58	0.39
Control Delay	28.9	2.8	30.2	3.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.9	2.8	30.2	3.1
LOS	C	A	C	A
Approach Delay	28.9	2.8		5.4
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 60 (86%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	225	1551	90	946
v/c Ratio	0.64	0.63	0.58	0.39
Control Delay	28.9	2.8	30.2	3.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.9	2.8	30.2	3.1
Queue Length 50th (m)	19.9	12.7	7.9	19.1
Queue Length 95th (m)	35.0	18.4	m14.9	m28.4
Internal Link Dist (m)	168.5	178.7		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	496	2457	155	2455
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.63	0.58	0.39

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	95	1423	128	90	946
Future Volume (vph)	130	95	1423	128	90	946
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.5		4.5		4.5	4.5
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1748		3534		1785	3544
Flt Permitted	0.97		1.00		0.12	1.00
Satd. Flow (perm)	1748		3534		224	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	95	1423	128	90	946
RTOR Reduction (vph)	39	0	7	0	0	0
Lane Group Flow (vph)	186	0	1544	0	90	946
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.5		48.5		48.5	48.5
Effective Green, g (s)	12.5		48.5		48.5	48.5
Actuated g/C Ratio	0.18		0.69		0.69	0.69
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	312		2448		155	2455
v/s Ratio Prot			c0.44			0.27
v/s Ratio Perm	c0.11				0.40	
v/c Ratio	0.60		0.63		0.58	0.39
Uniform Delay, d1	26.4		5.9		5.5	4.5
Progression Factor	1.00		0.31		2.30	0.56
Incremental Delay, d2	3.1		0.8		10.0	0.3
Delay (s)	29.5		2.6		22.7	2.8
Level of Service	C		A		C	A
Approach Delay (s)	29.5		2.6			4.5
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	133	13	111	5	17	1376	136	934
Future Volume (vph)	133	13	111	5	17	1376	136	934
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		6	5	2
Permitted Phases	4		8		6		2	
Detector Phase	4	4	8	8	6	6	5	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	5.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	9.5	25.0
Total Split (s)	23.0	23.0	23.0	23.0	37.0	37.0	10.0	47.0
Total Split (%)	32.9%	32.9%	32.9%	32.9%	52.9%	52.9%	14.3%	67.1%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	2.5	2.5	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	4.5	4.5	7.0	7.0	4.5	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	13.3	13.3	15.3	15.3	34.6	34.6	45.7	43.2
Actuated g/C Ratio	0.19	0.19	0.22	0.22	0.49	0.49	0.65	0.62
v/c Ratio	0.72	0.19	0.39	0.40	0.06	0.86	0.52	0.43
Control Delay	47.2	10.3	26.6	7.2	9.1	18.9	25.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	10.3	26.6	7.2	9.1	18.9	25.6	4.9
LOS	D	B	C	A	A	B	C	A
Approach Delay		34.9		14.2		18.8		7.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 33 (47%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 88.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	67	111	194	17	1512	136	951
v/c Ratio	0.72	0.19	0.39	0.40	0.06	0.86	0.52	0.43
Control Delay	47.2	10.3	26.6	7.2	9.1	18.9	25.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	10.3	26.6	7.2	9.1	18.9	25.6	4.9
Queue Length 50th (m)	15.0	1.3	11.4	1.3	0.9	100.0	13.7	13.0
Queue Length 95th (m)	#32.3	9.2	22.4	13.8	m1.6	#153.6	23.7	24.4
Internal Link Dist (m)		131.2		392.7		51.3		372.4
Turn Bay Length (m)			25.0		20.0		80.0	
Base Capacity (vph)	232	422	343	552	273	1751	264	2205
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	0.57	0.16	0.32	0.35	0.06	0.86	0.52	0.43

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	13	54	111	5	189	17	1376	136	136	934	17
Future Volume (vph)	133	13	54	111	5	189	17	1376	136	136	934	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		4.5	4.5		7.0	7.0		4.5	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.88		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1619		1733	1588		1750	3524		1750	3569	
Flt Permitted	0.53	1.00		0.71	1.00		0.30	1.00		0.10	1.00	
Satd. Flow (perm)	985	1619		1301	1588		554	3524		193	3569	
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)	133	13	54	111	5	189	17	1376	136	136	934	17
RTOR Reduction (vph)	0	44	0	0	141	0	0	10	0	0	2	0
Lane Group Flow (vph)	133	23	0	111	53	0	17	1502	0	136	949	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	13.3	13.3		15.3	15.3		33.6	33.6		43.2	43.2	
Effective Green, g (s)	13.3	13.3		15.3	15.3		33.6	33.6		43.2	43.2	
Actuated g/C Ratio	0.19	0.19		0.22	0.22		0.48	0.48		0.62	0.62	
Clearance Time (s)	6.5	6.5		4.5	4.5		7.0	7.0		4.5	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)	187	307		284	347		265	1691		232	2202	
v/s Ratio Prot		0.01			0.03			c0.43		c0.04	0.27	
v/s Ratio Perm	c0.13			0.09			0.03			0.32		
v/c Ratio	0.71	0.08		0.39	0.15		0.06	0.89		0.59	0.43	
Uniform Delay, d1	26.6	23.3		23.4	22.1		9.8	16.5		11.9	7.0	
Progression Factor	1.00	1.00		1.00	1.00		0.73	0.71		3.21	0.58	
Incremental Delay, d2	12.0	0.1		0.9	0.2		0.4	6.7		3.5	0.6	
Delay (s)	38.6	23.4		24.3	22.3		7.5	18.3		41.8	4.6	
Level of Service	D	C		C	C		A	B		D	A	
Approach Delay (s)		33.5			23.0			18.2			9.3	
Approach LOS		C			C			B			A	

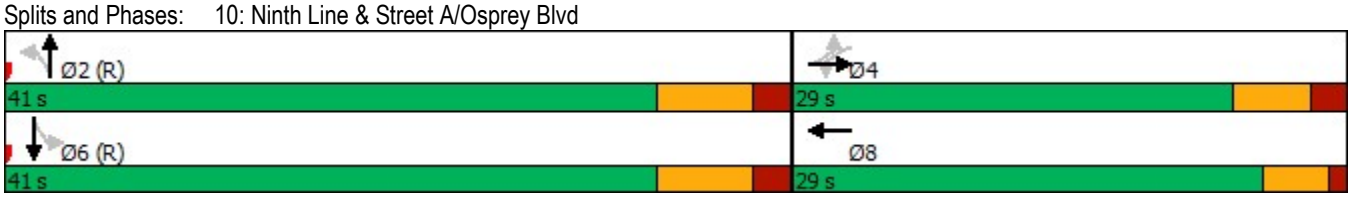
Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	93	0	232	0	30	1135	30	1065
Future Volume (vph)	93	0	232	0	30	1135	30	1065
Turn Type	Perm	NA	D.Pm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		4		2		6	
Detector Phase	4	4	4	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	8.0	8.0
Minimum Split (s)	23.0	23.0	23.0	22.5	23.0	23.0	23.0	23.0
Total Split (s)	29.0	29.0	29.0	29.0	41.0	41.0	41.0	41.0
Total Split (%)	41.4%	41.4%	41.4%	41.4%	58.6%	58.6%	58.6%	58.6%
Yellow Time (s)	4.0	4.0	4.0	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.5	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	17.7	17.7	17.7	19.2	39.3	39.3	39.3	39.3
Actuated g/C Ratio	0.25	0.25	0.25	0.27	0.56	0.56	0.56	0.56
v/c Ratio	0.28	0.21	0.75	0.18	0.13	0.65	0.18	0.54
Control Delay	21.6	9.3	38.6	8.2	8.7	8.8	10.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	9.3	38.6	8.2	8.7	8.8	10.0	9.4
LOS	C	A	D	A	A	A	A	A
Approach Delay		15.5		30.4		8.8		9.4
Approach LOS		B		C		A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 39 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 11.8	Intersection LOS: B
Intersection Capacity Utilization 64.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	93	232	86	30	1254	30	1073
v/c Ratio	0.28	0.21	0.75	0.18	0.13	0.65	0.18	0.54
Control Delay	21.6	9.3	38.6	8.2	8.7	8.8	10.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	9.3	38.6	8.2	8.7	8.8	10.0	9.4
Queue Length 50th (m)	8.9	2.8	25.4	2.1	1.5	40.9	1.9	38.7
Queue Length 95th (m)	17.3	10.8	42.5	9.5	m3.4	82.6	7.0	68.6
Internal Link Dist (m)		114.7		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	424	556	402	588	226	1940	170	2005
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	0.22	0.17	0.58	0.15	0.13	0.65	0.18	0.54

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	93	232	0	86	30	1135	119	30	1065	8
Future Volume (vph)	93	0	93	232	0	86	30	1135	119	30	1065	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	4.5		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	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3441		1785	3575	
Flt Permitted	0.70	1.00		0.70	1.00		0.22	1.00		0.16	1.00	
Satd. Flow (perm)	1292	1566		1223	1566		403	3441		303	3575	
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)	93	0	93	232	0	86	30	1135	119	30	1065	8
RTOR Reduction (vph)	0	46	0	0	45	0	0	10	0	0	0	0
Lane Group Flow (vph)	93	47	0	232	41	0	30	1244	0	30	1073	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		D.Pm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	17.7	17.7		17.7	19.2		39.3	39.3		39.3	39.3	
Effective Green, g (s)	17.7	17.7		17.7	19.2		39.3	39.3		39.3	39.3	
Actuated g/C Ratio	0.25	0.25		0.25	0.27		0.56	0.56		0.56	0.56	
Clearance Time (s)	6.0	6.0		6.0	4.5		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)	326	395		309	429		226	1931		170	2007	
v/s Ratio Prot		0.03			0.03			c0.36			0.30	
v/s Ratio Perm	0.07			c0.19			0.07			0.10		
v/c Ratio	0.29	0.12		0.75	0.10		0.13	0.64		0.18	0.53	
Uniform Delay, d1	21.1	20.1		24.1	18.9		7.3	10.5		7.5	9.6	
Progression Factor	1.00	1.00		1.00	1.00		0.84	0.68		0.79	0.80	
Incremental Delay, d2	0.5	0.1		9.8	0.1		0.8	1.2		2.2	1.0	
Delay (s)	21.5	20.3		34.0	19.0		6.9	8.3		8.0	8.7	
Level of Service	C	C		C	B		A	A		A	A	
Approach Delay (s)		20.9			29.9			8.3			8.7	
Approach LOS		C			C			A			A	

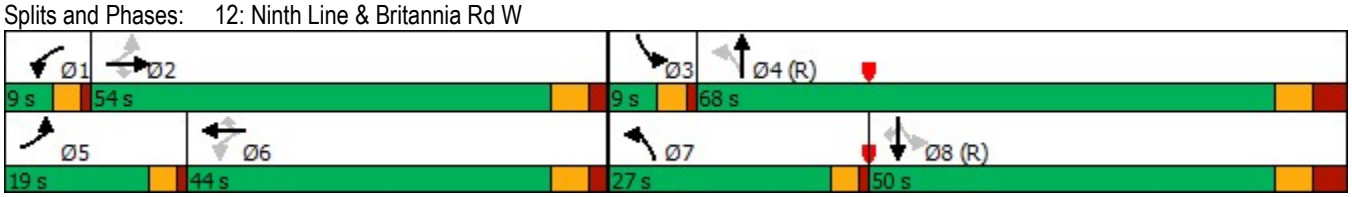
Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	227	1337	400	100	681	113	400	984	83	1001	168
Future Volume (vph)	227	1337	400	100	681	113	400	984	83	1001	168
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	3	8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	5	2	2	1	6	6	7	4	3	8	8
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	12.0	5.0	12.0	12.0
Minimum Split (s)	9.0	26.1	26.1	9.0	26.1	26.1	9.0	47.7	9.0	47.7	47.7
Total Split (s)	19.0	54.0	54.0	9.0	44.0	44.0	27.0	68.0	9.0	50.0	50.0
Total Split (%)	13.6%	38.6%	38.6%	6.4%	31.4%	31.4%	19.3%	48.6%	6.4%	35.7%	35.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.1	2.1	1.0	2.1	2.1	1.0	3.7	1.0	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7	4.0	7.7	7.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	59.0	47.9	47.9	45.5	38.4	38.4	73.0	60.3	51.0	42.3	42.3
Actuated g/C Ratio	0.42	0.34	0.34	0.32	0.27	0.27	0.52	0.43	0.36	0.30	0.30
v/c Ratio	0.78	1.07	0.56	0.84	0.69	0.21	1.15	0.76	0.54	0.93	0.28
Control Delay	46.7	90.6	15.7	80.2	49.8	2.3	135.0	41.0	34.4	58.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	90.6	15.7	80.2	49.8	2.3	135.0	41.0	34.4	58.9	8.9
LOS	D	F	B	F	D	A	F	D	C	E	A
Approach Delay		70.3			47.2			65.4		50.5	
Approach LOS		E			D			E		D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 88 (63%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 60.9	Intersection LOS: E
Intersection Capacity Utilization 110.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	227	1337	400	100	681	113	400	1138	83	1001	168
v/c Ratio	0.78	1.07	0.56	0.84	0.69	0.21	1.15	0.76	0.54	0.93	0.28
Control Delay	46.7	90.6	15.7	80.2	49.8	2.3	135.0	41.0	34.4	58.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	90.6	15.7	80.2	49.8	2.3	135.0	41.0	34.4	58.9	8.9
Queue Length 50th (m)	37.9	~198.4	27.4	15.5	82.5	0.0	~101.2	155.4	8.8	130.6	6.1
Queue Length 95th (m)	#61.3	#237.6	57.3	#40.7	102.5	4.0	#160.8	177.7	18.1	#168.8	15.0
Internal Link Dist (m)		80.1			420.4			341.1		608.8	
Turn Bay Length (m)	80.0		75.0	70.0		70.0	75.0		60.0		100.0
Base Capacity (vph)	296	1248	711	119	991	534	347	1506	155	1081	594
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.07	0.56	0.84	0.69	0.21	1.15	0.76	0.54	0.93	0.28

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	1337	400	100	681	113	400	984	154	83	1001	168
Future Volume (vph)	227	1337	400	100	681	113	400	984	154	83	1001	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7		4.0	7.7	7.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1785	3650	1581	1767	3614	1521	1767	3476		1668	3579	1581
Flt Permitted	0.18	1.00	1.00	0.10	1.00	1.00	0.09	1.00		0.17	1.00	1.00
Satd. Flow (perm)	335	3650	1581	194	3614	1521	161	3476		293	3579	1581
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)	227	1337	400	100	681	113	400	984	154	83	1001	168
RTOR Reduction (vph)	0	0	171	0	0	82	0	9	0	0	0	117
Lane Group Flow (vph)	227	1337	229	100	681	31	400	1129	0	83	1001	51
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	56.9	47.9	47.9	43.4	38.4	38.4	69.3	60.3		47.3	42.3	42.3
Effective Green, g (s)	56.9	47.9	47.9	43.4	38.4	38.4	69.3	60.3		47.3	42.3	42.3
Actuated g/C Ratio	0.41	0.34	0.34	0.31	0.27	0.27	0.49	0.43		0.34	0.30	0.30
Clearance Time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7		4.0	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	286	1248	540	116	991	417	343	1497		148	1081	477
v/s Ratio Prot	c0.08	c0.37		0.03	0.19		c0.19	0.32		0.02	0.28	
v/s Ratio Perm	0.24		0.14	0.24		0.02	c0.39			0.17		0.03
v/c Ratio	0.79	1.07	0.42	0.86	0.69	0.07	1.17	0.75		0.56	0.93	0.11
Uniform Delay, d1	31.0	46.0	35.4	43.2	45.4	37.6	45.0	33.6		33.2	47.3	35.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.12	1.13		1.09	0.97	1.56
Incremental Delay, d2	14.0	46.9	2.4	44.0	3.9	0.3	98.9	3.1		4.2	13.0	0.4
Delay (s)	45.0	93.0	37.9	87.3	49.3	38.0	149.3	41.1		40.4	58.7	55.2
Level of Service	D	F	D	F	D	D	F	D		D	E	E
Approach Delay (s)		76.2			52.1			69.3			57.0	
Approach LOS		E			D			E			E	

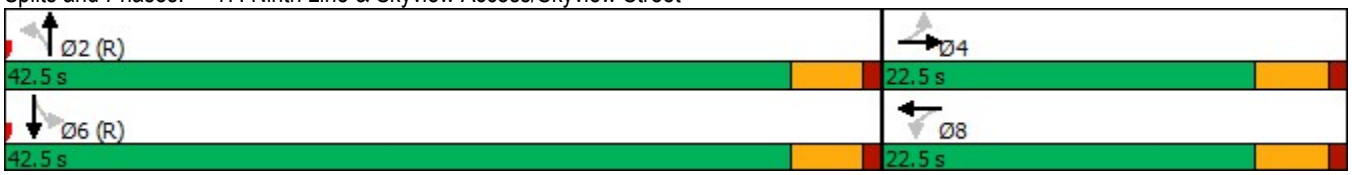
Intersection Summary			
HCM 2000 Control Delay	66.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.8
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	116	5	5	5	100	1081	2	1718
Future Volume (vph)	116	5	5	5	100	1081	2	1718
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	42.5	42.5	42.5	42.5
Total Split (%)	34.6%	34.6%	34.6%	34.6%	65.4%	65.4%	65.4%	65.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	15.2	15.2	15.2	15.2	40.8	40.8	40.8	40.8
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.63	0.63	0.63	0.63
v/c Ratio	0.36	0.76	0.03	0.04	0.88	0.49	0.01	0.80
Control Delay	23.2	34.6	18.0	11.6	89.8	17.8	8.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	34.6	18.0	11.6	89.8	17.8	8.0	11.4
LOS	C	C	B	B	F	B	A	B
Approach Delay		31.4		13.0		23.9		11.4
Approach LOS		C		B		C		B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 17: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	290	5	17	100	1083	2	1760
v/c Ratio	0.36	0.76	0.03	0.04	0.88	0.49	0.01	0.80
Control Delay	23.2	34.6	18.0	11.6	89.8	17.8	8.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	34.6	18.0	11.6	89.8	17.8	8.0	11.4
Queue Length 50th (m)	10.5	27.2	0.4	0.4	22.0	106.8	0.1	41.1
Queue Length 95th (m)	21.3	47.4	2.4	3.9	m#40.8	136.4	m0.1	#61.2
Internal Link Dist (m)		107.8		98.5		254.2		168.7
Turn Bay Length (m)					45.0		15.0	
Base Capacity (vph)	380	449	198	464	113	2198	254	2191
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	0.31	0.65	0.03	0.04	0.88	0.49	0.01	0.80

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	5	285	5	5	12	100	1081	2	2	1718	42
Future Volume (vph)	116	5	285	5	5	12	100	1081	2	2	1718	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1571		1750	1647		1750	3499		1750	3487	
Flt Permitted	0.75	1.00		0.39	1.00		0.10	1.00		0.22	1.00	
Satd. Flow (perm)	1375	1571		715	1647		181	3499		406	3487	
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)	116	5	285	5	5	12	100	1081	2	2	1718	42
RTOR Reduction (vph)	0	15	0	0	9	0	0	0	0	0	2	0
Lane Group Flow (vph)	116	275	0	5	8	0	100	1083	0	2	1758	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.2	15.2		15.2	15.2		40.8	40.8		40.8	40.8	
Effective Green, g (s)	15.2	15.2		15.2	15.2		40.8	40.8		40.8	40.8	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.63	0.63		0.63	0.63	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	321	367		167	385		113	2196		254	2188	
v/s Ratio Prot		c0.17			0.00			0.31			0.50	
v/s Ratio Perm	0.08			0.01			c0.55			0.00		
v/c Ratio	0.36	0.75		0.03	0.02		0.88	0.49		0.01	0.80	
Uniform Delay, d1	20.8	23.1		19.2	19.2		10.1	6.5		4.5	9.1	
Progression Factor	1.00	1.00		1.00	1.00		3.38	2.45		1.36	0.82	
Incremental Delay, d2	0.7	8.1		0.1	0.0		49.2	0.6		0.0	2.5	
Delay (s)	21.5	31.2		19.3	19.2		83.4	16.6		6.2	10.0	
Level of Service	C	C		B	B		F	B		A	A	
Approach Delay (s)		28.5			19.2			22.3			10.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	91	1406	26	1589
Future Volume (vph)	91	1406	26	1589
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.5	25.5	25.5
Total Split (s)	23.0	47.0	47.0	47.0
Total Split (%)	32.9%	67.1%	67.1%	67.1%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.8	52.8	52.8	52.8
Actuated g/C Ratio	0.14	0.75	0.75	0.75
v/c Ratio	0.49	0.56	0.12	0.59
Control Delay	26.3	2.6	2.7	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	2.6	2.7	5.8
LOS	C	A	A	A
Approach Delay	26.3	2.6		5.8
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 47 (67%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 5.2	Intersection LOS: A
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Ninth Line & McDowell Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	137	1487	26	1589
v/c Ratio	0.49	0.56	0.12	0.59
Control Delay	26.3	2.6	2.7	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	2.6	2.7	5.8
Queue Length 50th (m)	11.4	2.8	0.6	32.2
Queue Length 95th (m)	23.7	m8.0	m0.9	m175.5
Internal Link Dist (m)	322.0	187.3		341.1
Turn Bay Length (m)			25.0	
Base Capacity (vph)	503	2665	209	2699
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.56	0.12	0.59

Intersection Summary

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

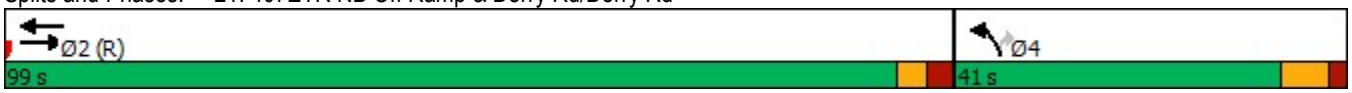
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	91	46	1406	81	26	1589
Future Volume (vph)	91	46	1406	81	26	1589
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1756		3529		1785	3579
Flt Permitted	0.97		1.00		0.15	1.00
Satd. Flow (perm)	1756		3529		278	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	91	46	1406	81	26	1589
RTOR Reduction (vph)	32	0	4	0	0	0
Lane Group Flow (vph)	105	0	1483	0	26	1589
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	8.4		50.6		50.6	50.6
Effective Green, g (s)	8.4		50.6		50.6	50.6
Actuated g/C Ratio	0.12		0.72		0.72	0.72
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	210		2550		200	2587
v/s Ratio Prot			0.42			c0.44
v/s Ratio Perm	c0.06				0.09	
v/c Ratio	0.50		0.58		0.13	0.61
Uniform Delay, d1	28.8		4.6		3.0	4.8
Progression Factor	1.00		0.41		0.44	0.97
Incremental Delay, d2	1.9		0.5		0.8	0.7
Delay (s)	30.7		2.3		2.1	5.4
Level of Service	C		A		A	A
Approach Delay (s)	30.7		2.3			5.3
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1769	1173	54	242
Future Volume (vph)	1769	1173	54	242
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	99.0	99.0	41.0	41.0
Total Split (%)	70.7%	70.7%	29.3%	29.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	93.0	93.0	34.0	34.0
Actuated g/C Ratio	0.66	0.66	0.24	0.24
v/c Ratio	0.74	0.50	0.08	0.62
Control Delay	18.1	12.8	41.4	49.3
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	18.4	12.8	41.4	49.3
LOS	B	B	D	D
Approach Delay	18.4	12.8	47.8	
Approach LOS	B	B	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1769	1173	54	242
v/c Ratio	0.74	0.50	0.08	0.62
Control Delay	18.1	12.8	41.4	49.3
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	18.4	12.8	41.4	49.3
Queue Length 50th (m)	146.8	73.8	5.5	48.7
Queue Length 95th (m)	171.5	88.1	10.8	75.8
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2377	2331	712	388
Starvation Cap Reductn	177	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.50	0.08	0.62

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1769	0	0	1173	54	242
Future Volume (vph)	1769	0	0	1173	54	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1769	0	0	1173	54	242
RTOR Reduction (vph)	0	0	0	0	0	23
Lane Group Flow (vph)	1769	0	0	1173	54	219
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	93.0			93.0	34.0	34.0
Effective Green, g (s)	93.0			93.0	34.0	34.0
Actuated g/C Ratio	0.66			0.66	0.24	0.24
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2377			2331	712	365
v/s Ratio Prot	c0.49			0.33	0.02	
v/s Ratio Perm						c0.15
v/c Ratio	0.74			0.50	0.08	0.60
Uniform Delay, d1	15.6			11.9	40.9	47.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	2.2			0.8	0.2	7.1
Delay (s)	17.8			12.6	41.1	54.1
Level of Service	B			B	D	D
Approach Delay (s)	17.8			12.6	51.7	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	208	183	1360	142	1522
Future Volume (vph)	208	183	1360	142	1522
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	25.5	25.5	27.5	9.5	27.5
Total Split (s)	26.0	26.0	34.0	10.0	44.0
Total Split (%)	37.1%	37.1%	48.6%	14.3%	62.9%
Yellow Time (s)	4.0	4.0	5.0	3.5	5.0
All-Red Time (s)	2.5	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.5	4.5	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.5	13.5	32.9	45.5	42.5
Actuated g/C Ratio	0.19	0.19	0.47	0.65	0.61
v/c Ratio	0.62	0.42	0.94	0.52	0.70
Control Delay	33.4	7.0	34.7	18.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	7.0	34.7	18.7	5.7
LOS	C	A	C	B	A
Approach Delay	21.1		34.7		6.8
Approach LOS	C		C		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 20 (29%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 20.4	Intersection LOS: C
Intersection Capacity Utilization 78.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	208	183	1553	142	1522
v/c Ratio	0.62	0.42	0.94	0.52	0.70
Control Delay	33.4	7.0	34.7	18.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	7.0	34.7	18.7	5.7
Queue Length 50th (m)	23.2	0.0	~101.3	9.8	18.3
Queue Length 95th (m)	37.3	12.1	#156.2	17.3	60.1
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	486	547	1645	275	2173
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.33	0.94	0.52	0.70

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.

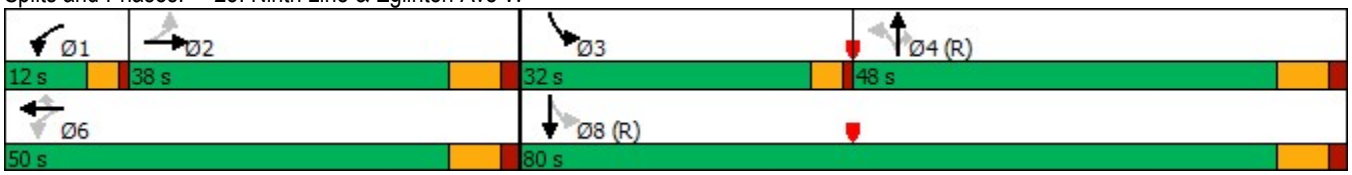
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	208	183	1360	193	142	1522
Future Volume (vph)	208	183	1360	193	142	1522
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	7.5		4.5	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1748	1493	3478		1653	3579
Flt Permitted	0.95	1.00	1.00		0.11	1.00
Satd. Flow (perm)	1748	1493	3478		191	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	208	183	1360	193	142	1522
RTOR Reduction (vph)	0	148	14	0	0	0
Lane Group Flow (vph)	208	35	1539	0	142	1522
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	13.5	13.5	31.9		42.5	42.5
Effective Green, g (s)	13.5	13.5	31.9		42.5	42.5
Actuated g/C Ratio	0.19	0.19	0.46		0.61	0.61
Clearance Time (s)	6.5	6.5	7.5		4.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	337	287	1584		243	2172
v/s Ratio Prot			c0.44		0.05	c0.43
v/s Ratio Perm	c0.12	0.02			0.30	
v/c Ratio	0.62	0.12	0.97		0.58	0.70
Uniform Delay, d1	25.9	23.4	18.6		12.9	9.4
Progression Factor	1.00	1.00	1.00		2.06	0.41
Incremental Delay, d2	3.3	0.2	16.8		2.9	1.6
Delay (s)	29.2	23.5	35.4		29.4	5.4
Level of Service	C	C	D		C	A
Approach Delay (s)	26.6		35.4			7.5
Approach LOS	C		D			A

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	38	612	99	264	256	28	856	150	400	1316
Future Volume (vph)	38	612	99	264	256	28	856	150	400	1316
Turn Type	Perm	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases		2	1	6			4		3	8
Permitted Phases	2		6		6	4		4	8	
Detector Phase	2	2	1	6	6	4	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	32.0	32.0	9.5	32.0	32.0	40.0	40.0	40.0	9.0	40.0
Total Split (s)	38.0	38.0	12.0	50.0	50.0	48.0	48.0	48.0	32.0	80.0
Total Split (%)	29.2%	29.2%	9.2%	38.5%	38.5%	36.9%	36.9%	36.9%	24.6%	61.5%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	4.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead	
Lead-Lag Optimize?										
Recall Mode	Max	Max	None	Max	Max	C-Max	C-Max	C-Max	None	C-Max
Act Effct Green (s)	31.2	31.2	46.0	43.0	43.0	43.4	43.4	43.4	76.0	73.0
Actuated g/C Ratio	0.24	0.24	0.35	0.33	0.33	0.33	0.33	0.33	0.58	0.56
v/c Ratio	0.15	0.87	0.59	0.43	0.39	0.41	0.74	0.25	0.90	0.69
Control Delay	41.2	58.1	44.1	36.6	5.4	56.4	43.5	13.1	51.6	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	58.1	44.1	36.6	5.4	56.4	43.5	13.1	51.6	19.5
LOS	D	E	D	D	A	E	D	B	D	B
Approach Delay		57.3		24.9			39.4			26.7
Approach LOS		E		C			D			C

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 18 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 94.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	735	99	264	256	28	856	150	400	1386
v/c Ratio	0.15	0.87	0.59	0.43	0.39	0.41	0.74	0.25	0.90	0.69
Control Delay	41.2	58.1	44.1	36.6	5.4	56.4	43.5	13.1	51.6	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	58.1	44.1	36.6	5.4	56.4	43.5	13.1	51.6	19.5
Queue Length 50th (m)	7.1	86.4	15.9	48.4	0.0	5.2	96.4	8.2	74.4	103.9
Queue Length 95th (m)	16.1	#114.7	28.0	71.5	16.9	#16.5	118.9	23.0	m#107.5	115.8
Internal Link Dist (m)		373.3		388.7			291.0			254.2
Turn Bay Length (m)	20.0		35.0			65.0		35.0	65.0	
Base Capacity (vph)	251	849	169	616	660	69	1161	593	469	1998
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.87	0.59	0.43	0.39	0.41	0.74	0.25	0.85	0.69

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Future Volume (vph)	38	612	123	99	264	256	28	856	150	400	1316	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		4.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1668	3485		1733	1865	1479	1069	3476	1574	1716	3555	
Flt Permitted	0.60	1.00		0.12	1.00	1.00	0.18	1.00	1.00	0.15	1.00	
Satd. Flow (perm)	1047	3485		215	1865	1479	208	3476	1574	271	3555	
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)	38	612	123	99	264	256	28	856	150	400	1316	70
RTOR Reduction (vph)	0	13	0	0	0	171	0	0	67	0	3	0
Lane Group Flow (vph)	38	722	0	99	264	85	28	856	83	400	1383	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6		6	4		4	8		
Actuated Green, G (s)	31.2	31.2		43.0	43.0	43.0	43.4	43.4	43.4	73.0	73.0	
Effective Green, g (s)	31.2	31.2		43.0	43.0	43.0	43.4	43.4	43.4	73.0	73.0	
Actuated g/C Ratio	0.24	0.24		0.33	0.33	0.33	0.33	0.33	0.33	0.56	0.56	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	251	836		162	616	489	69	1160	525	436	1996	
v/s Ratio Prot		c0.21		c0.04	0.14			0.25		c0.18	0.39	
v/s Ratio Perm	0.04			0.17		0.06	0.13		0.05	c0.33		
v/c Ratio	0.15	0.86		0.61	0.43	0.17	0.41	0.74	0.16	0.92	0.69	
Uniform Delay, d1	39.0	47.4		33.5	33.9	30.9	33.4	38.3	30.4	31.3	20.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.31	0.89	
Incremental Delay, d2	1.3	11.5		6.7	2.2	0.8	16.8	4.2	0.6	16.4	1.2	
Delay (s)	40.2	58.9		40.1	36.1	31.6	50.1	42.5	31.1	57.6	19.3	
Level of Service	D	E		D	D	C	D	D	C	E	B	
Approach Delay (s)		57.9			34.9			41.0			27.9	
Approach LOS		E			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	48	1373	65	1639
Future Volume (vph)	48	1373	65	1639
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	8.0	8.0	8.0
Minimum Split (s)	22.5	24.0	24.0	24.0
Total Split (s)	23.0	42.0	42.0	42.0
Total Split (%)	35.4%	64.6%	64.6%	64.6%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.8	47.9	47.9	47.9
Actuated g/C Ratio	0.15	0.74	0.74	0.74
v/c Ratio	0.53	0.56	0.33	0.62
Control Delay	24.9	1.8	11.5	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.9	1.8	11.5	7.4
LOS	C	A	B	A
Approach Delay	24.9	1.8		7.6
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 29 (45%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	1448	65	1639
v/c Ratio	0.53	0.56	0.33	0.62
Control Delay	24.9	1.8	11.5	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.9	1.8	11.5	7.4
Queue Length 50th (m)	11.8	5.3	2.4	44.3
Queue Length 95th (m)	24.0	10.1	12.2	79.5
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	513	2585	195	2636
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.56	0.33	0.62

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	106	1373	75	65	1639
Future Volume (vph)	48	106	1373	75	65	1639
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.5		6.0		6.0	6.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1704		3506		1684	3579
Flt Permitted	0.98		1.00		0.15	1.00
Satd. Flow (perm)	1704		3506		267	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	106	1373	75	65	1639
RTOR Reduction (vph)	34	0	4	0	0	0
Lane Group Flow (vph)	120	0	1444	0	65	1639
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	8.7		45.8		45.8	45.8
Effective Green, g (s)	8.7		45.8		45.8	45.8
Actuated g/C Ratio	0.13		0.70		0.70	0.70
Clearance Time (s)	4.5		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	228		2470		188	2521
v/s Ratio Prot			0.41			c0.46
v/s Ratio Perm	c0.07				0.24	
v/c Ratio	0.53		0.58		0.35	0.65
Uniform Delay, d1	26.2		4.8		3.7	5.2
Progression Factor	1.00		0.19		1.00	1.00
Incremental Delay, d2	2.2		0.9		5.0	1.3
Delay (s)	28.4		1.8		8.7	6.5
Level of Service	C		A		A	A
Approach Delay (s)	28.4		1.8			6.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	145	82	1115	110	1685
Future Volume (vph)	145	82	1115	110	1685
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	22.5	22.5	22.0	9.0	22.0
Total Split (s)	23.0	23.0	33.0	9.0	42.0
Total Split (%)	35.4%	35.4%	50.8%	13.8%	64.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.9	10.9	37.0	46.5	45.7
Actuated g/C Ratio	0.17	0.17	0.57	0.72	0.70
v/c Ratio	0.49	0.24	0.61	0.32	0.67
Control Delay	29.8	7.9	27.5	8.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	7.9	27.5	8.7	6.5
LOS	C	A	C	A	A
Approach Delay	21.9		27.5		6.6
Approach LOS	C		C		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 62 (95%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	145	82	1192	110	1685
v/c Ratio	0.49	0.24	0.61	0.32	0.67
Control Delay	29.8	7.9	27.5	8.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	7.9	27.5	8.7	6.5
Queue Length 50th (m)	14.9	0.0	119.7	3.1	30.4
Queue Length 95th (m)	26.7	8.4	125.2	m8.5	49.5
Internal Link Dist (m)	358.4		267.4		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	448	466	1950	347	2517
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.18	0.61	0.32	0.67

Intersection Summary

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

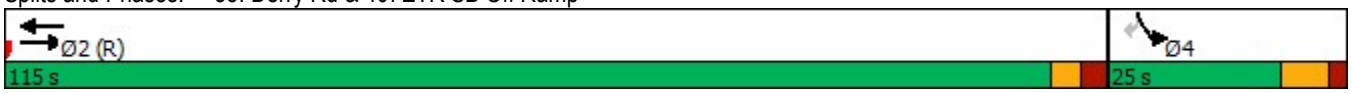
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	145	82	1115	77	110	1685
Future Volume (vph)	145	82	1115	77	110	1685
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	6.5	6.5	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3416		1785	3579
Flt Permitted	0.95	1.00	1.00		0.14	1.00
Satd. Flow (perm)	1765	1597	3416		271	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	145	82	1115	77	110	1685
RTOR Reduction (vph)	0	70	6	0	0	0
Lane Group Flow (vph)	145	12	1186	0	110	1685
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	9.3	9.3	33.7		43.2	43.2
Effective Green, g (s)	9.3	9.3	33.7		43.2	43.2
Actuated g/C Ratio	0.14	0.14	0.52		0.66	0.66
Clearance Time (s)	6.5	6.5	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	252	228	1771		308	2378
v/s Ratio Prot			0.35		0.03	c0.47
v/s Ratio Perm	c0.08	0.01			0.21	
v/c Ratio	0.58	0.05	0.67		0.36	0.71
Uniform Delay, d1	26.0	24.0	11.5		6.1	6.9
Progression Factor	1.00	1.00	2.07		1.54	0.66
Incremental Delay, d2	3.2	0.1	1.8		0.6	1.5
Delay (s)	29.2	24.1	25.7		10.0	6.0
Level of Service	C	C	C		A	A
Approach Delay (s)	27.4		25.7			6.3
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	2270	1010	54	46
Future Volume (vph)	2270	1010	54	46
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	115.0	115.0	25.0	25.0
Total Split (%)	82.1%	82.1%	17.9%	17.9%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	122.9	122.9	8.1	8.1
Actuated g/C Ratio	0.88	0.88	0.06	0.06
v/c Ratio	0.72	0.33	0.30	0.39
Control Delay	5.5	2.3	67.0	26.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	2.3	67.0	26.0
LOS	A	A	E	C
Approach Delay	5.5	2.3	48.1	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 79.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2270	1010	54	46
v/c Ratio	0.72	0.33	0.30	0.39
Control Delay	5.5	2.3	67.0	26.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.5	2.3	67.0	26.0
Queue Length 50th (m)	92.5	21.5	6.9	0.0
Queue Length 95th (m)	126.1	30.0	13.3	11.8
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	3171	3080	404	208
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.33	0.13	0.22

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2270	1010	0	54	46
Future Volume (vph)	0	2270	1010	0	54	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2270	1010	0	54	46
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	0	2270	1010	0	54	2
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		120.3	120.3		6.7	6.7
Effective Green, g (s)		120.3	120.3		6.7	6.7
Actuated g/C Ratio		0.86	0.86		0.05	0.05
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3105	3016		150	62
v/s Ratio Prot		c0.63	0.29		c0.02	
v/s Ratio Perm						0.00
v/c Ratio		0.73	0.33		0.36	0.04
Uniform Delay, d1		3.7	1.9		64.6	63.6
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.6	0.3		1.5	0.2
Delay (s)		5.3	2.2		66.1	63.8
Level of Service		A	A		E	E
Approach Delay (s)		5.3	2.2		65.0	
Approach LOS		A	A		E	

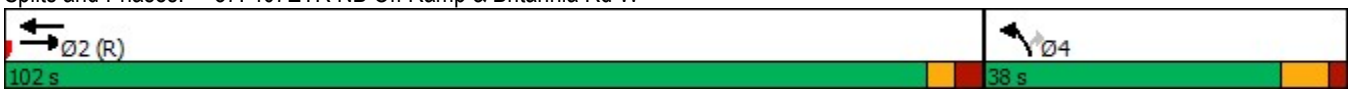
Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1807	1063	69	208
Future Volume (vph)	1807	1063	69	208
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	102.0	102.0	38.0	38.0
Total Split (%)	72.9%	72.9%	27.1%	27.1%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	105.6	105.6	21.4	21.4
Actuated g/C Ratio	0.75	0.75	0.15	0.15
v/c Ratio	0.66	0.39	0.28	0.78
Control Delay	10.7	7.1	53.4	68.1
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	11.1	7.1	53.4	68.1
LOS	B	A	D	E
Approach Delay	11.1	7.1	64.4	
Approach LOS	B	A	E	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1807	1063	69	208
v/c Ratio	0.66	0.39	0.28	0.78
Control Delay	10.7	7.1	53.4	68.1
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	11.1	7.1	53.4	68.1
Queue Length 50th (m)	105.1	44.0	15.8	44.3
Queue Length 95th (m)	158.4	67.9	27.3	65.6
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2726	2700	356	370
Starvation Cap Reductn	360	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.39	0.19	0.56

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1807	0	0	1063	69	208
Future Volume (vph)	1807	0	0	1063	69	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	6.0			6.0	7.0	7.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1807	0	0	1063	69	208
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	1807	0	0	1063	69	182
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	105.6			105.6	21.4	21.4
Effective Green, g (s)	105.6			105.6	21.4	21.4
Actuated g/C Ratio	0.75			0.75	0.15	0.15
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2725			2699	245	239
v/s Ratio Prot	c0.50			0.30	0.04	
v/s Ratio Perm						c0.12
v/c Ratio	0.66			0.39	0.28	0.76
Uniform Delay, d1	8.5			6.0	52.5	56.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.3			0.4	0.6	13.3
Delay (s)	9.7			6.4	53.1	70.1
Level of Service	A			A	D	E
Approach Delay (s)	9.7			6.4	65.9	
Approach LOS	A			A	E	

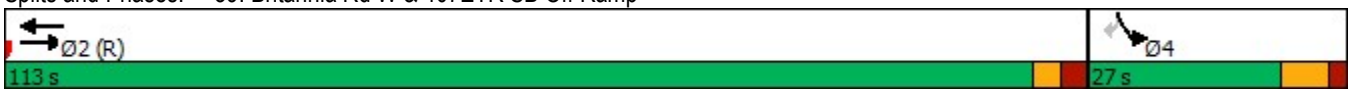
Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1993	996	70	63
Future Volume (vph)	1993	996	70	63
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	113.0	113.0	27.0	27.0
Total Split (%)	80.7%	80.7%	19.3%	19.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	115.8	115.8	11.2	11.2
Actuated g/C Ratio	0.83	0.83	0.08	0.08
v/c Ratio	0.67	0.34	0.52	0.41
Control Delay	6.3	3.4	74.6	21.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	3.4	74.6	21.3
LOS	A	A	E	C
Approach Delay	6.3	3.4	49.3	
Approach LOS	A	A	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1993	996	70	63
v/c Ratio	0.67	0.34	0.52	0.41
Control Delay	6.3	3.4	74.6	21.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	3.4	74.6	21.3
Queue Length 50th (m)	82.7	25.7	17.4	0.0
Queue Length 95th (m)	120.1	38.4	31.4	12.8
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2988	2959	240	226
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.34	0.29	0.28

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1993	996	0	70	63
Future Volume (vph)	0	1993	996	0	70	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		6.0	6.0		7.0	7.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1993	996	0	70	63
RTOR Reduction (vph)	0	0	0	0	0	58
Lane Group Flow (vph)	0	1993	996	0	70	5
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		115.8	115.8		11.2	11.2
Effective Green, g (s)		115.8	115.8		11.2	11.2
Actuated g/C Ratio		0.83	0.83		0.08	0.08
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2989	2960		134	96
v/s Ratio Prot		c0.55	0.28		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.67	0.34		0.52	0.05
Uniform Delay, d1		4.7	2.9		61.8	59.5
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.2	0.3		3.6	0.2
Delay (s)		5.9	3.2		65.5	59.7
Level of Service		A	A		E	E
Approach Delay (s)		5.9	3.2		62.8	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	5	42	46	5	68	10	1240	36	30	1116	39
Future Volume (Veh/h)	29	5	42	46	5	68	10	1240	36	30	1116	39
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)	29	5	42	46	5	68	10	1240	36	30	1116	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.78	0.78		0.78	0.78	0.78				0.78		
vC, conflicting volume	1906	2492	578	1940	2493	638	1155			1276		
vC1, stage 1 conf vol	1196	1196		1278	1278							
vC2, stage 2 conf vol	710	1296		662	1215							
vCu, unblocked vol	1590	2344	578	1634	2346	0	1155			777		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	97	91	78	97	92	98			95		
cM capacity (veh/h)	178	176	459	212	178	846	601			643		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	47	46	73	10	827	449	30	744	411
Volume Left	29	0	46	0	10	0	0	30	0	0
Volume Right	0	42	0	68	0	0	36	0	0	39
cSH	178	392	212	673	601	1700	1700	643	1700	1700
Volume to Capacity	0.16	0.12	0.22	0.11	0.02	0.49	0.26	0.05	0.44	0.24
Queue Length 95th (m)	4.0	2.8	5.6	2.5	0.4	0.0	0.0	1.0	0.0	0.0
Control Delay (s)	29.1	15.4	26.6	11.0	11.1	0.0	0.0	10.9	0.0	0.0
Lane LOS	D	C	D	B	B			B		
Approach Delay (s)	20.7		17.0		0.1			0.3		
Approach LOS	C		C							

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	38	11	1161	1821	6
Future Volume (Veh/h)	21	38	11	1161	1821	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)	21	38	11	1161	1821	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				193	291	
pX, platoon unblocked	0.71	0.63	0.63			
vC, conflicting volume	2426	914	1827			
vC1, stage 1 conf vol	1824					
vC2, stage 2 conf vol	602					
vCu, unblocked vol	1170	0	1139			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	94	97			
cM capacity (veh/h)	165	684	384			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	21	38	11	580	580	1214	613
Volume Left	21	0	11	0	0	0	0
Volume Right	0	38	0	0	0	0	6
cSH	165	684	384	1700	1700	1700	1700
Volume to Capacity	0.13	0.06	0.03	0.34	0.34	0.71	0.36
Queue Length 95th (m)	3.0	1.2	0.6	0.0	0.0	0.0	0.0
Control Delay (s)	29.9	10.6	14.7	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	17.5		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	8	2	1557	1073	18
Future Volume (Veh/h)	20	8	2	1557	1073	18
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)	20	8	2	1557	1073	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				397	203	
pX, platoon unblocked	0.70	0.89	0.89			
vC, conflicting volume	1864	546	1091			
vC1, stage 1 conf vol	1082					
vC2, stage 2 conf vol	782					
vCu, unblocked vol	677	253	863			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	328	667	692			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	20	8	521	1038	715	376
Volume Left	20	0	2	0	0	0
Volume Right	0	8	0	0	0	18
cSH	328	667	692	1700	1700	1700
Volume to Capacity	0.06	0.01	0.00	0.61	0.42	0.22
Queue Length 95th (m)	1.4	0.3	0.1	0.0	0.0	0.0
Control Delay (s)	16.7	10.5	0.1	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	14.9		0.0		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	15	9	1401	1079	16
Future Volume (Veh/h)	42	15	9	1401	1079	16
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)	42	15	9	1401	1079	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					384	
pX, platoon unblocked	0.89	0.89	0.89			
vC, conflicting volume	1806	548	1095			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1661	250	864			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	46	98	99			
cM capacity (veh/h)	78	669	691			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	15	9	700	700	719	376
Volume Left	42	0	9	0	0	0	0
Volume Right	0	15	0	0	0	0	16
cSH	78	669	691	1700	1700	1700	1700
Volume to Capacity	0.54	0.02	0.01	0.41	0.41	0.42	0.22
Queue Length 95th (m)	16.3	0.5	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	96.3	10.5	10.3	0.0	0.0	0.0	0.0
Lane LOS	F	B	B				
Approach Delay (s)	73.7		0.1			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

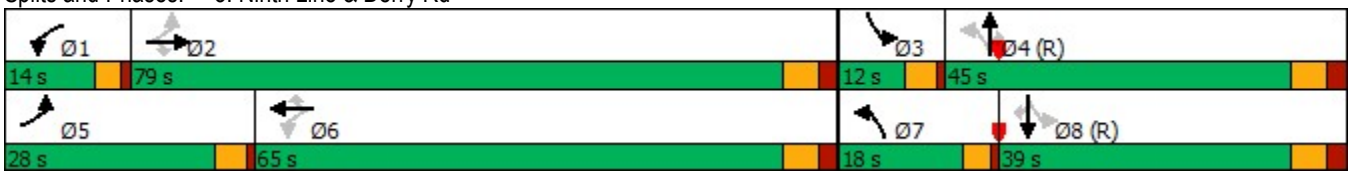
Timings
3: Ninth Line & Derry Rd

04/22/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
Future Volume (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.5	30.1	30.1	11.0	30.1	30.1	11.0	29.4	29.4	11.5	29.4	29.4
Total Split (s)	28.0	79.0	79.0	14.0	65.0	65.0	18.0	45.0	45.0	12.0	39.0	39.0
Total Split (%)	18.7%	52.7%	52.7%	9.3%	43.3%	43.3%	12.0%	30.0%	30.0%	8.0%	26.0%	26.0%
Yellow Time (s)	3.5	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	2.1	2.1	1.0	2.1	2.1	1.0	2.4	2.4	1.0	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.1	6.1	4.0	6.1	6.1	4.0	6.4	8.8	4.5	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	88.5	73.2	73.2	70.7	58.9	58.9	53.0	41.0	38.6	41.9	32.6	32.6
Actuated g/C Ratio	0.59	0.49	0.49	0.47	0.39	0.39	0.35	0.27	0.26	0.28	0.22	0.22
v/c Ratio	1.18	0.41	0.43	0.42	1.17	0.06	1.14	0.84	0.29	0.41	0.97	0.74
Control Delay	148.8	25.5	8.1	18.7	124.1	0.2	146.2	53.2	13.6	42.8	83.2	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.8	25.5	8.1	18.7	124.1	0.2	146.2	53.2	13.6	42.8	83.2	28.7
LOS	F	C	A	B	F	A	F	D	B	D	F	C
Approach Delay		51.2			111.5			67.4			63.4	
Approach LOS		D			F			E			E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 31 (21%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 76.3	Intersection LOS: E
Intersection Capacity Utilization 116.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Ninth Line & Derry Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
v/c Ratio	1.18	0.41	0.43	0.42	1.17	0.06	1.14	0.84	0.29	0.41	0.97	0.74
Control Delay	148.8	25.5	8.1	18.7	124.1	0.2	146.2	53.2	13.6	42.8	83.2	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.8	25.5	8.1	18.7	124.1	0.2	146.2	53.2	13.6	42.8	83.2	28.7
Queue Length 50th (m)	~106.0	65.6	16.8	19.5	~274.6	0.0	~61.4	118.3	8.1	10.3	109.9	38.7
Queue Length 95th (m)	#164.7	80.3	39.2	30.1	#313.5	0.0	#117.1	#147.8	18.9	19.7	#147.1	75.9
Internal Link Dist (m)		119.7			244.5			681.0			237.0	
Turn Bay Length (m)	75.0		45.0	80.0			130.0		45.0	95.0		80.0
Base Capacity (vph)	312	1763	925	394	1378	704	215	988	489	136	785	541
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.41	0.43	0.42	1.17	0.06	1.14	0.84	0.29	0.41	0.97	0.74

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
Future Volume (vph)	367	722	400	165	1608	45	246	831	140	56	761	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.5	6.1	6.1	4.0	6.1	6.1	4.0	6.4	8.8	4.5	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	3614	1597	1733	3510	1566	1750	3614	1566	1716	3614	1581
Flt Permitted	0.06	1.00	1.00	0.38	1.00	1.00	0.11	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	112	3614	1597	686	3510	1566	201	3614	1566	222	3614	1581
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)	367	722	400	165	1608	45	246	831	140	56	761	400
RTOR Reduction (vph)	0	0	147	0	0	27	0	0	88	0	0	198
Lane Group Flow (vph)	367	722	253	165	1608	18	246	831	52	56	761	202
Heavy Vehicles (%)	6%	1%	0%	3%	4%	2%	2%	1%	2%	4%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		8
Actuated Green, G (s)	86.9	73.2	73.2	68.6	58.9	58.9	50.6	40.1	40.1	38.6	32.6	32.6
Effective Green, g (s)	86.9	73.2	73.2	68.6	58.9	58.9	50.6	40.1	37.7	38.6	32.6	32.6
Actuated g/C Ratio	0.58	0.49	0.49	0.46	0.39	0.39	0.34	0.27	0.25	0.26	0.22	0.22
Clearance Time (s)	4.5	6.1	6.1	4.0	6.1	6.1	4.0	6.4	6.4	4.5	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	311	1763	779	381	1378	614	212	966	393	116	785	343
v/s Ratio Prot	c0.18	0.20		0.03	0.46		c0.11	0.23		0.02	0.21	
v/s Ratio Perm	c0.50		0.16	0.17		0.01	c0.28		0.03	0.10		0.13
v/c Ratio	1.18	0.41	0.32	0.43	1.17	0.03	1.16	0.86	0.13	0.48	0.97	0.59
Uniform Delay, d1	51.6	24.6	23.4	24.4	45.5	28.0	42.7	52.3	43.5	44.4	58.2	52.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.28	0.87	1.09	1.00	1.00	1.00
Incremental Delay, d2	109.2	0.7	1.1	0.8	83.3	0.1	108.8	9.0	0.6	3.1	25.5	7.2
Delay (s)	160.7	25.3	24.5	25.2	128.9	28.1	163.6	54.3	47.9	47.6	83.7	59.9
Level of Service	F	C	C	C	F	C	F	D	D	D	F	E
Approach Delay (s)		58.5			117.0			75.6			74.2	
Approach LOS		E			F			E			E	

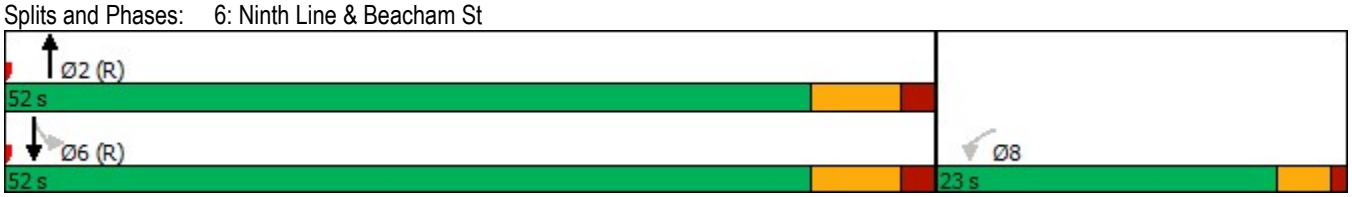
Intersection Summary			
HCM 2000 Control Delay	84.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	116.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	131	1082	81	1357
Future Volume (vph)	131	1082	81	1357
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	52.0	52.0	52.0
Total Split (%)	30.7%	69.3%	69.3%	69.3%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.7	51.3	51.3	51.3
Actuated g/C Ratio	0.17	0.68	0.68	0.68
v/c Ratio	0.64	0.49	0.30	0.56
Control Delay	31.9	4.5	5.3	6.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.9	4.5	5.3	6.0
LOS	C	A	A	A
Approach Delay	31.9	4.5		6.0
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 63 (84%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Beacham St



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	1192	81	1357
v/c Ratio	0.64	0.49	0.30	0.56
Control Delay	31.9	4.5	5.3	6.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.9	4.5	5.3	6.0
Queue Length 50th (m)	20.9	9.2	2.6	30.6
Queue Length 95th (m)	36.3	13.8	m4.9	m46.7
Internal Link Dist (m)	168.5	178.7		681.0
Turn Bay Length (m)			45.0	
Base Capacity (vph)	473	2420	270	2423
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.49	0.30	0.56

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	131	80	1082	110	81	1357
Future Volume (vph)	131	80	1082	110	81	1357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1754		3529		1785	3544
Flt Permitted	0.97		1.00		0.21	1.00
Satd. Flow (perm)	1754		3529		395	3544
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	80	1082	110	81	1357
RTOR Reduction (vph)	32	0	8	0	0	0
Lane Group Flow (vph)	179	0	1184	0	81	1357
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.7		51.3		51.3	51.3
Effective Green, g (s)	12.7		51.3		51.3	51.3
Actuated g/C Ratio	0.17		0.68		0.68	0.68
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	297		2413		270	2424
v/s Ratio Prot			0.34			c0.38
v/s Ratio Perm	c0.10				0.20	
v/c Ratio	0.60		0.49		0.30	0.56
Uniform Delay, d1	28.8		5.6		4.7	6.1
Progression Factor	1.00		0.63		0.53	0.80
Incremental Delay, d2	3.4		0.6		2.1	0.7
Delay (s)	32.2		4.2		4.6	5.5
Level of Service	C		A		A	A
Approach Delay (s)	32.2		4.2			5.5
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	79	8	147	13	52	1059	157	1404
Future Volume (vph)	79	8	147	13	52	1059	157	1404
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		6		2
Permitted Phases	4		8		6		2	
Detector Phase	4	4	8	8	6	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	24.5	24.5	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	50.0	50.0	50.0	50.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.4	13.4	13.4	13.4	48.1	48.1	48.1	48.1
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.64	0.64	0.64	0.64
v/c Ratio	0.35	0.13	0.62	0.33	0.34	0.52	0.64	0.64
Control Delay	30.0	11.7	39.1	10.9	15.3	8.7	18.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	11.7	39.1	10.9	15.3	8.7	18.1	4.6
LOS	C	B	D	B	B	A	B	A
Approach Delay		23.8		26.5		9.0		5.9
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 24 (32%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Street F/Doug Leavens Blvd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	79	40	147	119	52	1169	157	1457
v/c Ratio	0.35	0.13	0.62	0.33	0.34	0.52	0.64	0.64
Control Delay	30.0	11.7	39.1	10.9	15.3	8.7	18.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	11.7	39.1	10.9	15.3	8.7	18.1	4.6
Queue Length 50th (m)	9.1	0.9	17.9	2.8	2.7	36.6	5.9	25.0
Queue Length 95th (m)	18.3	7.1	31.3	13.3	12.2	60.8	#40.6	26.5
Internal Link Dist (m)		131.2		392.7		51.3		372.4
Turn Bay Length (m)			25.0		20.0		80.0	
Base Capacity (vph)	309	423	328	467	155	2267	244	2286
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	0.26	0.09	0.45	0.25	0.34	0.52	0.64	0.64

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	8	32	147	13	106	52	1059	110	157	1404	53
Future Volume (vph)	79	8	32	147	13	106	52	1059	110	157	1404	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		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	0.95	
Frt	1.00	0.88		1.00	0.87		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1621		1733	1610		1750	3522		1750	3559	
Flt Permitted	0.68	1.00		0.73	1.00		0.13	1.00		0.21	1.00	
Satd. Flow (perm)	1254	1621		1333	1610		244	3522		381	3559	
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)	79	8	32	147	13	106	52	1059	110	157	1404	53
RTOR Reduction (vph)	0	26	0	0	77	0	0	9	0	0	3	0
Lane Group Flow (vph)	79	14	0	147	42	0	52	1160	0	157	1454	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	2%	4%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	13.4	13.4		13.4	13.4		48.1	48.1		48.1	48.1	
Effective Green, g (s)	13.4	13.4		13.4	13.4		48.1	48.1		48.1	48.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.64	0.64		0.64	0.64	
Clearance Time (s)	6.5	6.5		6.5	6.5		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)	224	289		238	287		156	2258		244	2282	
v/s Ratio Prot		0.01			0.03			0.33			0.41	
v/s Ratio Perm	0.06			c0.11			0.21			c0.41		
v/c Ratio	0.35	0.05		0.62	0.15		0.33	0.51		0.64	0.64	
Uniform Delay, d1	27.0	25.5		28.4	26.0		6.1	7.2		8.2	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.57	0.38	
Incremental Delay, d2	1.0	0.1		4.7	0.2		5.7	0.8		11.0	1.2	
Delay (s)	28.0	25.6		33.1	26.2		11.8	8.0		15.7	4.3	
Level of Service	C	C		C	C		B	A		B	A	
Approach Delay (s)		27.2			30.0			8.2			5.4	
Approach LOS		C			C			A			A	

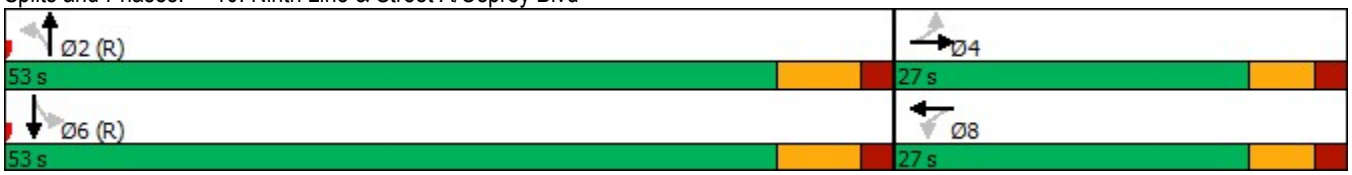
Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	0	270	0	92	1305	45	1308
Future Volume (vph)	55	0	270	0	92	1305	45	1308
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	23.0	23.0	24.0	24.0	23.0	23.0	23.0	23.0
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	19.6	19.6	19.6	19.6	47.4	47.4	47.4	47.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.59	0.59	0.59	0.59
v/c Ratio	0.17	0.13	0.87	0.08	0.58	0.73	0.38	0.63
Control Delay	24.4	7.8	57.4	3.6	18.6	9.6	20.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	7.8	57.4	3.6	18.6	9.6	20.7	12.6
LOS	C	A	E	A	B	A	C	B
Approach Delay		16.1		51.7		10.2		12.9
Approach LOS		B		D		B		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: Ninth Line & Street A/Osprey Blvd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	55	270	32	92	1488	45	1332
v/c Ratio	0.17	0.13	0.87	0.08	0.58	0.73	0.38	0.63
Control Delay	24.4	7.8	57.4	3.6	18.6	9.6	20.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	7.8	57.4	3.6	18.6	9.6	20.7	12.6
Queue Length 50th (m)	5.9	0.0	35.4	0.0	8.1	69.2	3.2	60.7
Queue Length 95th (m)	13.9	7.3	#70.9	3.2	m13.0	m97.4	12.3	79.3
Internal Link Dist (m)		114.7		224.9		608.8		273.4
Turn Bay Length (m)			10.0		15.0		35.0	
Base Capacity (vph)	355	451	332	451	159	2040	120	2115
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.12	0.81	0.07	0.58	0.73	0.38	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	55	270	0	32	92	1305	183	45	1308	24
Future Volume (vph)	55	0	55	270	0	32	92	1305	183	45	1308	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		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	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1566		1668	1566		1750	3421		1785	3569	
Flt Permitted	0.74	1.00		0.72	1.00		0.15	1.00		0.11	1.00	
Satd. Flow (perm)	1356	1566		1266	1566		268	3421		204	3569	
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	0	55	270	0	32	92	1305	183	45	1308	24
RTOR Reduction (vph)	0	42	0	0	24	0	0	13	0	0	2	0
Lane Group Flow (vph)	55	13	0	270	8	0	92	1475	0	45	1330	0
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	10%	0%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.6	19.6		19.6	19.6		47.4	47.4		47.4	47.4	
Effective Green, g (s)	19.6	19.6		19.6	19.6		47.4	47.4		47.4	47.4	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.59	0.59		0.59	0.59	
Clearance Time (s)	6.0	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	3.0	
Lane Grp Cap (vph)	332	383		310	383		158	2026		120	2114	
v/s Ratio Prot		0.01			0.01			c0.43			0.37	
v/s Ratio Perm	0.04			c0.21			0.34			0.22		
v/c Ratio	0.17	0.04		0.87	0.02		0.58	0.73		0.38	0.63	
Uniform Delay, d1	23.8	23.0		29.0	22.9		10.1	11.7		8.5	10.6	
Progression Factor	1.00	1.00		1.00	1.00		0.85	0.71		1.00	1.00	
Incremental Delay, d2	0.2	0.0		22.4	0.0		8.1	1.2		8.7	1.4	
Delay (s)	24.0	23.0		51.4	22.9		16.7	9.5		17.3	12.0	
Level of Service	C	C		D	C		B	A		B	B	
Approach Delay (s)		23.5			48.4			9.9			12.2	
Approach LOS		C			D			A			B	

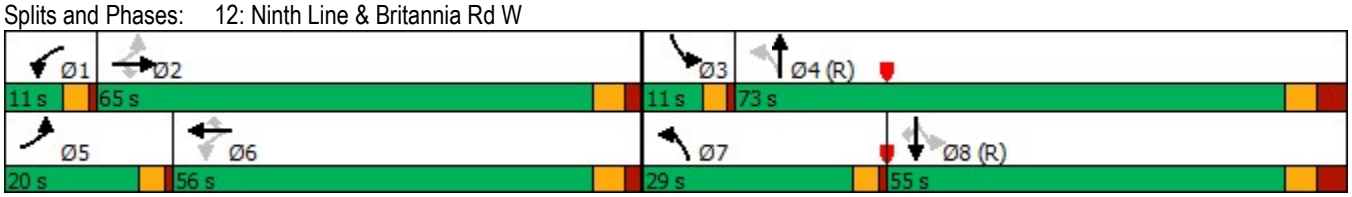
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	288	729	400	92	1299	101	400	1113	90	1061	369
Future Volume (vph)	288	729	400	92	1299	101	400	1113	90	1061	369
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4	3	8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	5	2	2	1	6	6	7	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	12.0	7.0	12.0	12.0
Minimum Split (s)	11.0	26.1	26.1	11.0	26.1	26.1	11.0	47.7	11.0	47.7	47.7
Total Split (s)	20.0	65.0	65.0	11.0	56.0	56.0	29.0	73.0	11.0	55.0	55.0
Total Split (%)	12.5%	40.6%	40.6%	6.9%	35.0%	35.0%	18.1%	45.6%	6.9%	34.4%	34.4%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.1	2.1	1.0	2.1	2.1	1.0	3.7	1.0	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7	4.0	7.7	7.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	72.0	58.9	58.9	59.0	49.9	49.9	80.0	65.3	58.0	47.3	47.3
Actuated g/C Ratio	0.45	0.37	0.37	0.37	0.31	0.31	0.50	0.41	0.36	0.30	0.30
v/c Ratio	1.27	0.54	0.50	0.37	1.15	0.18	1.23	0.83	0.67	1.00	0.63
Control Delay	188.7	41.8	7.8	31.2	127.3	2.3	157.8	50.8	54.3	85.8	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	188.7	41.8	7.8	31.2	127.3	2.3	157.8	50.8	54.3	85.8	35.7
LOS	F	D	A	C	F	A	F	D	D	F	D
Approach Delay		62.0			112.9			77.6		71.8	
Approach LOS		E			F			E		E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 81.2	Intersection LOS: F
Intersection Capacity Utilization 121.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: Ninth Line & Britannia Rd W



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	288	729	400	92	1299	101	400	1196	90	1061	369
v/c Ratio	1.27	0.54	0.50	0.37	1.15	0.18	1.23	0.83	0.67	1.00	0.63
Control Delay	188.7	41.8	7.8	31.2	127.3	2.3	157.8	50.8	54.3	85.8	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	188.7	41.8	7.8	31.2	127.3	2.3	157.8	50.8	54.3	85.8	35.7
Queue Length 50th (m)	~91.2	88.6	9.0	15.5	~234.8	0.0	~129.0	164.9	13.9	~168.4	64.3
Queue Length 95th (m)	#146.5	107.2	33.8	26.2	#274.2	4.1	#188.9	198.6	m#24.9	#211.6	m96.2
Internal Link Dist (m)		80.1			420.4			341.1		608.8	
Turn Bay Length (m)	80.0		75.0	70.0		70.0	75.0		60.0		100.0
Base Capacity (vph)	227	1343	805	247	1127	571	325	1436	134	1058	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.54	0.50	0.37	1.15	0.18	1.23	0.83	0.67	1.00	0.63

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	729	400	92	1299	101	400	1113	83	90	1061	369
Future Volume (vph)	288	729	400	92	1299	101	400	1113	83	90	1061	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7		4.0	7.7	7.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1785	3650	1581	1767	3614	1521	1767	3509		1668	3579	1581
Flt Permitted	0.07	1.00	1.00	0.28	1.00	1.00	0.08	1.00		0.11	1.00	1.00
Satd. Flow (perm)	139	3650	1581	525	3614	1521	145	3509		193	3579	1581
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)	288	729	400	92	1299	101	400	1113	83	90	1061	369
RTOR Reduction (vph)	0	0	223	0	0	70	0	4	0	0	0	123
Lane Group Flow (vph)	288	729	177	92	1299	31	400	1192	0	90	1061	246
Heavy Vehicles (%)	0%	0%	1%	1%	1%	5%	1%	3%	2%	7%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	69.9	58.9	58.9	56.9	49.9	49.9	76.3	65.3		54.3	47.3	47.3
Effective Green, g (s)	69.9	58.9	58.9	56.9	49.9	49.9	76.3	65.3		54.3	47.3	47.3
Actuated g/C Ratio	0.44	0.37	0.37	0.36	0.31	0.31	0.48	0.41		0.34	0.30	0.30
Clearance Time (s)	4.0	6.1	6.1	4.0	6.1	6.1	4.0	7.7		4.0	7.7	7.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	225	1343	582	241	1127	474	322	1432		130	1058	467
v/s Ratio Prot	c0.13	0.20		0.02	0.36		c0.19	0.34		0.03	0.30	
v/s Ratio Perm	c0.43		0.11	0.12		0.02	c0.40			0.20		0.16
v/c Ratio	1.28	0.54	0.30	0.38	1.15	0.07	1.24	0.83		0.69	1.00	0.53
Uniform Delay, d1	51.1	39.9	36.0	35.6	55.1	38.7	53.3	42.5		39.4	56.4	47.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.10		1.41	1.11	1.28
Incremental Delay, d2	155.6	1.6	1.3	1.0	79.1	0.3	124.9	3.8		11.5	24.8	3.2
Delay (s)	206.7	41.5	37.3	36.6	134.2	39.0	172.2	50.6		67.0	87.2	63.3
Level of Service	F	D	D	D	F	D	F	D		E	F	E
Approach Delay (s)		73.9			121.7			81.1			80.2	
Approach LOS		E			F			F			F	

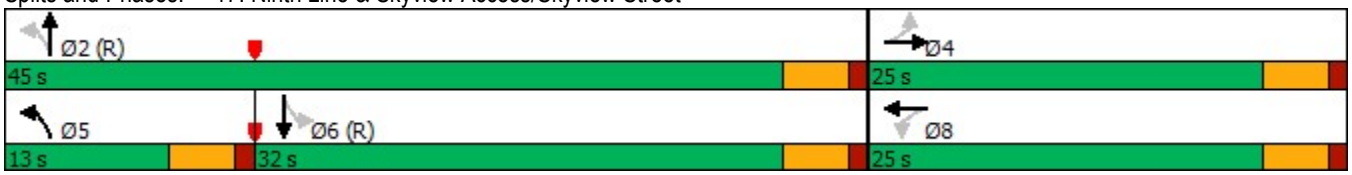
Intersection Summary			
HCM 2000 Control Delay	89.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.8
Intersection Capacity Utilization	121.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	78	5	4	5	293	1724	14	1377
Future Volume (vph)	78	5	4	5	293	1724	14	1377
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.5	24.5	24.5	24.5	9.5	24.0	24.0	24.0
Total Split (s)	25.0	25.0	25.0	25.0	13.0	45.0	32.0	32.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	18.6%	64.3%	45.7%	45.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.3	9.3	9.3	9.3	51.7	51.7	34.0	34.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.74	0.74	0.49	0.49
v/c Ratio	0.42	0.52	0.04	0.04	0.67	0.67	0.11	0.89
Control Delay	34.0	10.3	25.0	20.1	18.1	12.2	20.4	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	18.1	12.2	20.4	30.8
LOS	C	B	C	C	B	B	C	C
Approach Delay		17.1		21.6		13.1		30.7
Approach LOS		B		C		B		C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 20.4	Intersection LOS: C
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Ninth Line & Skyview Access/Skyview Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	78	194	4	9	293	1729	14	1497
v/c Ratio	0.42	0.52	0.04	0.04	0.67	0.67	0.11	0.89
Control Delay	34.0	10.3	25.0	20.1	18.1	12.2	20.4	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	10.3	25.0	20.1	18.1	12.2	20.4	30.8
Queue Length 50th (m)	8.8	0.5	0.4	0.6	28.9	178.5	1.3	107.6
Queue Length 95th (m)	18.4	14.4	2.5	3.6	m27.2	m180.2	m2.7	#205.8
Internal Link Dist (m)		133.8		136.4		256.6		164.9
Turn Bay Length (m)					45.0		15.0	
Base Capacity (vph)	405	594	238	506	436	2584	122	1685
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.33	0.02	0.02	0.67	0.67	0.11	0.89

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	5	189	4	5	4	293	1724	5	14	1377	120
Future Volume (vph)	78	5	189	4	5	4	293	1724	5	14	1377	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1573		1750	1719		1750	3498		1750	3458	
Flt Permitted	0.75	1.00		0.44	1.00		0.10	1.00		0.14	1.00	
Satd. Flow (perm)	1385	1573		814	1719		191	3498		253	3458	
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)	78	5	189	4	5	4	293	1724	5	14	1377	120
RTOR Reduction (vph)	0	164	0	0	3	0	0	0	0	0	8	0
Lane Group Flow (vph)	78	30	0	4	6	0	293	1729	0	14	1489	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Effective Green, g (s)	9.3	9.3		9.3	9.3		51.7	51.7		34.0	34.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.49	0.49	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	208		108	228		435	2583		122	1679	
v/s Ratio Prot		0.02			0.00		0.13	c0.49			c0.43	
v/s Ratio Perm	c0.06			0.00			0.37			0.06		
v/c Ratio	0.42	0.14		0.04	0.02		0.67	0.67		0.11	0.89	
Uniform Delay, d1	27.9	26.8		26.4	26.4		16.0	4.7		9.8	16.3	
Progression Factor	1.00	1.00		1.00	1.00		1.27	2.20		1.42	1.36	
Incremental Delay, d2	1.6	0.3		0.1	0.0		2.0	0.7		1.7	6.5	
Delay (s)	29.5	27.2		26.6	26.4		22.3	11.1		15.6	28.7	
Level of Service	C	C		C	C		C	B		B	C	
Approach Delay (s)		27.8			26.5			12.7			28.6	
Approach LOS		C			C			B			C	

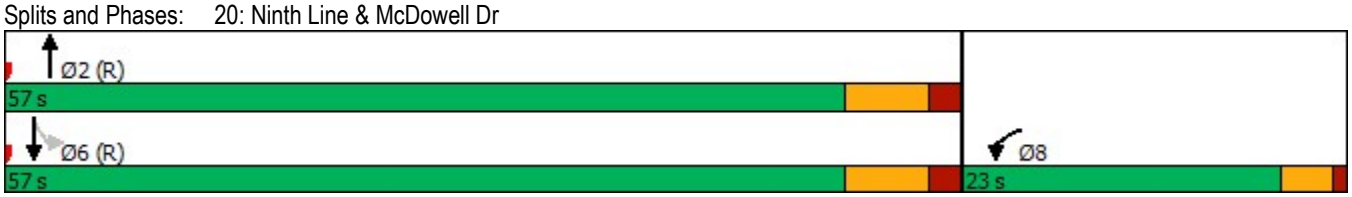
Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	117	1697	26	1441
Future Volume (vph)	117	1697	26	1441
Turn Type	Prot	NA	Perm	NA
Protected Phases	8	2		6
Permitted Phases			6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	57.0	57.0	57.0
Total Split (%)	28.8%	71.3%	71.3%	71.3%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.1	56.9	56.9	56.9
Actuated g/C Ratio	0.15	0.71	0.71	0.71
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	6.9	4.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	6.9	4.8
LOS	C	B	A	A
Approach Delay	34.9	10.7		4.9
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 19 (24%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 20: Ninth Line & McDowell Dr



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	176	1902	26	1441
v/c Ratio	0.61	0.77	0.28	0.57
Control Delay	34.9	10.7	6.9	4.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	10.7	6.9	4.8
Queue Length 50th (m)	19.5	71.7	0.5	25.6
Queue Length 95th (m)	34.3	125.0	m0.9	m33.6
Internal Link Dist (m)	322.0	187.3		341.1
Turn Bay Length (m)			25.0	
Base Capacity (vph)	438	2484	94	2545
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.77	0.28	0.57

Intersection Summary

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

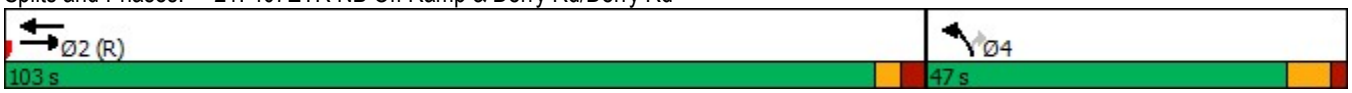
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	117	59	1697	205	26	1441
Future Volume (vph)	117	59	1697	205	26	1441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.95		0.98		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1757		3480		1785	3579
Flt Permitted	0.97		1.00		0.07	1.00
Satd. Flow (perm)	1757		3480		133	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	59	1697	205	26	1441
RTOR Reduction (vph)	24	0	9	0	0	0
Lane Group Flow (vph)	152	0	1893	0	26	1441
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	12.1		56.9		56.9	56.9
Effective Green, g (s)	12.1		56.9		56.9	56.9
Actuated g/C Ratio	0.15		0.71		0.71	0.71
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	265		2475		94	2545
v/s Ratio Prot	c0.09		c0.54			0.40
v/s Ratio Perm					0.20	
v/c Ratio	0.57		0.76		0.28	0.57
Uniform Delay, d1	31.6		7.3		4.2	5.6
Progression Factor	1.00		1.00		0.50	0.72
Incremental Delay, d2	3.0		2.3		3.8	0.5
Delay (s)	34.6		9.6		5.8	4.5
Level of Service	C		A		A	A
Approach Delay (s)	34.6		9.6			4.5
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1157	2189	67	498
Future Volume (vph)	1157	2189	67	498
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	103.0	103.0	47.0	47.0
Total Split (%)	68.7%	68.7%	31.3%	31.3%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	98.5	98.5	42.5	42.5
Actuated g/C Ratio	0.66	0.66	0.28	0.28
v/c Ratio	0.49	0.95	0.08	0.99
Control Delay	13.9	34.1	39.9	79.9
Queue Delay	0.0	40.9	0.0	0.0
Total Delay	13.9	75.1	39.9	79.9
LOS	B	E	D	E
Approach Delay	13.9	75.1	75.1	
Approach LOS	B	E	E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 57.0	Intersection LOS: E
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: 407ETR NB Off Ramp & Derry Rd/Derry Rd



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1157	2189	67	498
v/c Ratio	0.49	0.95	0.08	0.99
Control Delay	13.9	34.1	39.9	79.9
Queue Delay	0.0	40.9	0.0	0.0
Total Delay	13.9	75.1	39.9	79.9
Queue Length 50th (m)	79.7	270.9	7.0	113.8
Queue Length 95th (m)	93.7	#316.1	12.7	#182.3
Internal Link Dist (m)	73.6	69.5	127.8	
Turn Bay Length (m)				
Base Capacity (vph)	2350	2304	831	502
Starvation Cap Reductn	0	301	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	1.09	0.08	0.99

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1157	0	0	2189	67	498
Future Volume (vph)	1157	0	0	2189	67	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3579			3510	2935	1507
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3579			3510	2935	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1157	0	0	2189	67	498
RTOR Reduction (vph)	0	0	0	0	0	76
Lane Group Flow (vph)	1157	0	0	2189	67	422
Heavy Vehicles (%)	2%	0%	0%	4%	18%	6%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	97.0			97.0	40.0	40.0
Effective Green, g (s)	98.5			98.5	42.5	42.5
Actuated g/C Ratio	0.66			0.66	0.28	0.28
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2350			2304	831	426
v/s Ratio Prot	0.32			c0.62	0.02	
v/s Ratio Perm						c0.28
v/c Ratio	0.49			0.95	0.08	0.99
Uniform Delay, d1	13.1			23.5	39.4	53.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			10.2	0.2	41.4
Delay (s)	13.8			33.7	39.6	94.9
Level of Service	B			C	D	F
Approach Delay (s)	13.8			33.7	88.4	
Approach LOS	B			C	F	

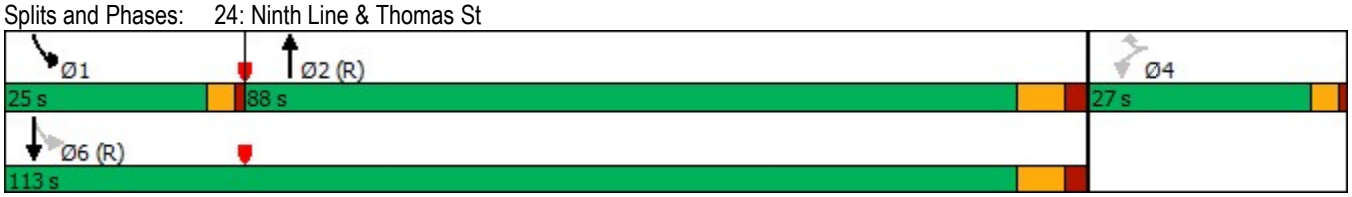
Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	178	322	1680	237	1313
Future Volume (vph)	178	322	1680	237	1313
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	8.0	7.0	8.0
Minimum Split (s)	25.5	25.5	27.5	11.0	27.5
Total Split (s)	27.0	27.0	88.0	25.0	113.0
Total Split (%)	19.3%	19.3%	62.9%	17.9%	80.7%
Yellow Time (s)	3.0	3.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	7.5	4.0	7.5
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	18.8	18.8	87.0	113.2	109.7
Actuated g/C Ratio	0.13	0.13	0.62	0.81	0.78
v/c Ratio	0.76	0.79	0.85	0.87	0.47
Control Delay	78.4	29.4	15.9	70.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	29.4	15.9	70.1	6.1
LOS	E	C	B	E	A
Approach Delay	46.9		15.9		15.9
Approach LOS	D		B		B

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Ninth Line & Thomas St



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	178	322	1842	237	1313
v/c Ratio	0.76	0.79	0.85	0.87	0.47
Control Delay	78.4	29.4	15.9	70.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	29.4	15.9	70.1	6.1
Queue Length 50th (m)	44.1	19.2	133.6	44.8	53.0
Queue Length 95th (m)	66.0	51.4	159.1	#82.8	71.5
Internal Link Dist (m)	339.8		639.8		385.4
Turn Bay Length (m)				50.0	
Base Capacity (vph)	286	447	2177	300	2804
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.72	0.85	0.79	0.47

Intersection Summary

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

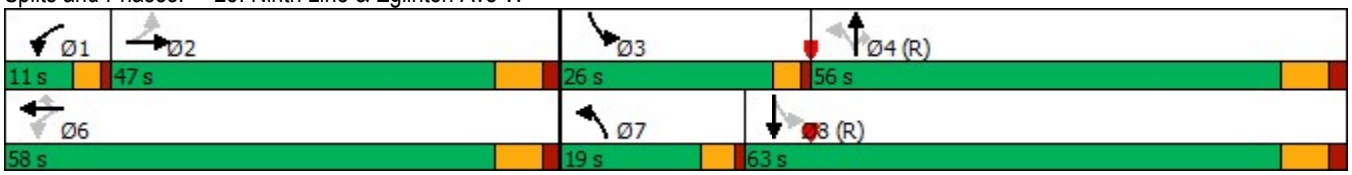
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	178	322	1680	162	237	1313
Future Volume (vph)	178	322	1680	162	237	1313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0	4.0	7.5		4.0	7.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1746	1493	3497		1653	3579
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	1746	1493	3497		76	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	178	322	1680	162	237	1313
RTOR Reduction (vph)	0	210	5	0	0	0
Lane Group Flow (vph)	178	112	1837	0	237	1313
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	18.8	18.8	87.0		109.7	109.7
Effective Green, g (s)	18.8	18.8	87.0		109.7	109.7
Actuated g/C Ratio	0.13	0.13	0.62		0.78	0.78
Clearance Time (s)	4.0	4.0	7.5		4.0	7.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	200	2173		270	2804
v/s Ratio Prot			0.53		c0.12	0.37
v/s Ratio Perm	c0.10	0.08			c0.57	
v/c Ratio	0.76	0.56	0.85		0.88	0.47
Uniform Delay, d1	58.4	56.7	21.1		47.8	5.2
Progression Factor	1.00	1.00	0.56		1.00	1.00
Incremental Delay, d2	13.6	3.6	2.8		25.8	0.6
Delay (s)	72.0	60.3	14.6		73.6	5.7
Level of Service	E	E	B		E	A
Approach Delay (s)	64.5		14.6			16.1
Approach LOS	E		B			B

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	54	562	154	728	538	110	1244	208	374	1042
Future Volume (vph)	54	562	154	728	538	110	1244	208	374	1042
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	1	6		7	4		3	8
Permitted Phases	2		6		6	4		4	8	
Detector Phase	2	2	1	6	6	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0
Minimum Split (s)	32.0	32.0	11.0	32.0	32.0	11.5	40.0	40.0	11.0	40.0
Total Split (s)	47.0	47.0	11.0	58.0	58.0	19.0	56.0	56.0	26.0	63.0
Total Split (%)	33.6%	33.6%	7.9%	41.4%	41.4%	13.6%	40.0%	40.0%	18.6%	45.0%
Yellow Time (s)	5.0	5.0	3.0	5.0	5.0	3.5	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	4.0	7.0	7.0	4.5	7.0	10.0	4.0	7.0
Lead/Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	40.0	40.0	54.0	51.0	51.0	63.9	49.0	46.0	78.0	58.1
Actuated g/C Ratio	0.29	0.29	0.39	0.36	0.36	0.46	0.35	0.33	0.56	0.42
v/c Ratio	1.08	0.61	0.67	1.07	0.74	0.72	1.02	0.34	1.16	0.74
Control Delay	199.5	45.8	46.5	97.8	23.9	47.3	76.3	15.2	134.8	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.5	45.8	46.5	97.8	23.9	47.3	76.3	15.2	134.8	40.6
LOS	F	D	D	F	C	D	E	B	F	D
Approach Delay		58.0		64.3			66.2			64.6
Approach LOS		E		E			E			E

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 20 (14%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.16	
Intersection Signal Delay: 64.1	Intersection LOS: E
Intersection Capacity Utilization 120.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Ninth Line & Eglinton Ave W



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	54	622	154	728	538	110	1244	208	374	1091
v/c Ratio	1.08	0.61	0.67	1.07	0.74	0.72	1.02	0.34	1.16	0.74
Control Delay	199.5	45.8	46.5	97.8	23.9	47.3	76.3	15.2	134.8	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.5	45.8	46.5	97.8	23.9	47.3	76.3	15.2	134.8	40.6
Queue Length 50th (m)	~15.3	71.5	26.3	~205.5	56.8	13.5	~177.0	14.3	~94.7	152.9
Queue Length 95th (m)	#41.7	90.0	#42.4	#274.2	100.0	#32.6	#216.0	33.1	m#130.0	m173.7
Internal Link Dist (m)		373.3		388.7			291.0			256.6
Turn Bay Length (m)	20.0		35.0			65.0		35.0	65.0	
Base Capacity (vph)	50	1017	229	679	725	169	1216	603	323	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.61	0.67	1.07	0.74	0.65	1.02	0.34	1.16	0.74

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Future Volume (vph)	54	562	60	154	728	538	110	1244	208	374	1042	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		4.0	7.0	7.0	4.5	7.0	10.0	4.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1668	3540		1733	1865	1479	1069	3476	1574	1716	3558	
Flt Permitted	0.10	1.00		0.23	1.00	1.00	0.14	1.00	1.00	0.08	1.00	
Satd. Flow (perm)	176	3540		427	1865	1479	161	3476	1574	136	3558	
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)	54	562	60	154	728	538	110	1244	208	374	1042	49
RTOR Reduction (vph)	0	6	0	0	0	186	0	0	87	0	2	0
Lane Group Flow (vph)	54	616	0	154	728	352	110	1244	121	374	1089	0
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	7%	1%	6%	3%	3%	8%	67%	5%	0%	4%	2%	0%
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4		4	8		
Actuated Green, G (s)	40.0	40.0		51.0	51.0	51.0	61.4	49.0	49.0	75.0	58.1	
Effective Green, g (s)	40.0	40.0		51.0	51.0	51.0	61.4	49.0	46.0	75.0	58.1	
Actuated g/C Ratio	0.29	0.29		0.36	0.36	0.36	0.44	0.35	0.33	0.54	0.42	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	4.5	7.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	50	1011		220	679	538	151	1216	517	321	1476	
v/s Ratio Prot		0.17		0.03	c0.39		0.06	0.36		c0.18	0.31	
v/s Ratio Perm	0.31			0.22		0.24	0.26		0.08	c0.44		
v/c Ratio	1.08	0.61		0.70	1.07	0.65	0.73	1.02	0.23	1.17	0.74	
Uniform Delay, d1	50.0	43.2		35.8	44.5	37.1	27.4	45.5	34.2	46.4	34.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.27	1.10	
Incremental Delay, d2	151.5	2.7		9.4	55.5	6.1	16.1	31.8	1.1	91.8	1.8	
Delay (s)	201.5	46.0		45.2	100.0	43.2	43.5	77.3	35.3	150.6	39.9	
Level of Service	F	D		D	F	D	D	E	D	F	D	
Approach Delay (s)		58.4			72.5			69.3			68.1	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	68.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	120.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	97	1751	65	1460
Future Volume (vph)	97	1751	65	1460
Turn Type	Perm	NA	Perm	NA
Protected Phases		2		6
Permitted Phases	8		6	
Detector Phase	8	2	6	6
Switch Phase				
Minimum Initial (s)	7.0	8.0	8.0	8.0
Minimum Split (s)	22.5	25.0	25.0	25.0
Total Split (s)	23.0	47.0	47.0	47.0
Total Split (%)	32.9%	67.1%	67.1%	67.1%
Yellow Time (s)	3.0	5.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	12.3	46.7	46.7	46.7
Actuated g/C Ratio	0.18	0.67	0.67	0.67
v/c Ratio	0.60	0.78	0.64	0.61
Control Delay	31.4	3.7	37.4	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	3.7	37.4	5.8
LOS	C	A	D	A
Approach Delay	31.4	3.7		7.2
Approach LOS	C	A		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 32 (46%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 74.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 29: Ninth Line & Tacc Dr

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	1826	65	1460
v/c Ratio	0.60	0.78	0.64	0.61
Control Delay	31.4	3.7	37.4	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	3.7	37.4	5.8
Queue Length 50th (m)	19.4	2.9	3.1	35.8
Queue Length 95th (m)	33.5	m17.2	m#38.5	53.2
Internal Link Dist (m)	395.8	650.7		639.8
Turn Bay Length (m)			65.0	
Base Capacity (vph)	484	2348	101	2388
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.78	0.64	0.61

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.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	97	94	1751	75	65	1460
Future Volume (vph)	97	94	1751	75	65	1460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0		7.0		7.0	7.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.93		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1740		3514		1684	3579
Flt Permitted	0.98		1.00		0.09	1.00
Satd. Flow (perm)	1740		3514		152	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	97	94	1751	75	65	1460
RTOR Reduction (vph)	14	0	3	0	0	0
Lane Group Flow (vph)	177	0	1823	0	65	1460
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8				6	
Actuated Green, G (s)	12.3		46.7		46.7	46.7
Effective Green, g (s)	12.3		46.7		46.7	46.7
Actuated g/C Ratio	0.18		0.67		0.67	0.67
Clearance Time (s)	4.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	305		2344		101	2387
v/s Ratio Prot			c0.52			0.41
v/s Ratio Perm	c0.10				0.43	
v/c Ratio	0.58		0.78		0.64	0.61
Uniform Delay, d1	26.5		8.1		6.8	6.6
Progression Factor	1.00		0.28		0.84	0.67
Incremental Delay, d2	2.8		1.2		24.9	1.1
Delay (s)	29.3		3.5		30.6	5.4
Level of Service	C		A		C	A
Approach Delay (s)	29.3		3.5			6.5
Approach LOS	C		A			A

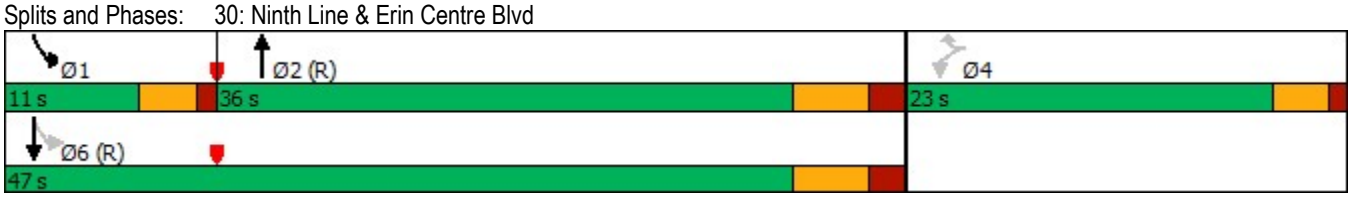
Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	132	158	1688	143	1361
Future Volume (vph)	132	158	1688	143	1361
Turn Type	Perm	Perm	NA	pm+pt	NA
Protected Phases			2	1	6
Permitted Phases	4	4		6	
Detector Phase	4	4	2	1	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	8.0	7.0	8.0
Minimum Split (s)	22.5	22.5	22.0	11.0	22.0
Total Split (s)	23.0	23.0	36.0	11.0	47.0
Total Split (%)	32.9%	32.9%	51.4%	15.7%	67.1%
Yellow Time (s)	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	6.0	4.0	6.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.6	10.6	39.8	51.4	49.4
Actuated g/C Ratio	0.15	0.15	0.57	0.73	0.71
v/c Ratio	0.49	0.42	0.93	0.47	0.54
Control Delay	32.9	8.4	29.2	17.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	8.4	29.2	17.1	4.5
LOS	C	A	C	B	A
Approach Delay	19.5		29.2		5.7
Approach LOS	B		C		A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 68 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Ninth Line & Erin Centre Blvd



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	132	158	1813	143	1361
v/c Ratio	0.49	0.42	0.93	0.47	0.54
Control Delay	32.9	8.4	29.2	17.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	8.4	29.2	17.1	4.5
Queue Length 50th (m)	14.8	0.0	156.7	8.8	16.9
Queue Length 95th (m)	26.8	12.1	#276.7	21.8	42.8
Internal Link Dist (m)	358.4		268.7		650.7
Turn Bay Length (m)				35.0	
Base Capacity (vph)	479	548	1944	307	2523
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.29	0.93	0.47	0.54

Intersection Summary

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

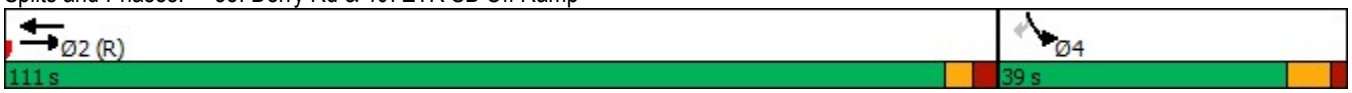
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	132	158	1688	125	143	1361
Future Volume (vph)	132	158	1688	125	143	1361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.7	3.5	3.5	3.7
Total Lost time (s)	4.0	4.0	6.0		4.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1765	1597	3409		1785	3579
Flt Permitted	0.95	1.00	1.00		0.09	1.00
Satd. Flow (perm)	1765	1597	3409		175	3579
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	132	158	1688	125	143	1361
RTOR Reduction (vph)	0	134	6	0	0	0
Lane Group Flow (vph)	132	24	1807	0	143	1361
Confl. Peds. (#/hr)	1			1	1	
Heavy Vehicles (%)	1%	0%	4%	30%	0%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	4	4			6	
Actuated Green, G (s)	10.6	10.6	39.0		49.4	49.4
Effective Green, g (s)	10.6	10.6	39.0		49.4	49.4
Actuated g/C Ratio	0.15	0.15	0.56		0.71	0.71
Clearance Time (s)	4.0	4.0	6.0		4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	267	241	1899		270	2525
v/s Ratio Prot			c0.53		0.05	c0.38
v/s Ratio Perm	c0.07	0.01			0.32	
v/c Ratio	0.49	0.10	0.95		0.53	0.54
Uniform Delay, d1	27.2	25.6	14.6		12.9	4.9
Progression Factor	1.00	1.00	1.32		2.81	0.72
Incremental Delay, d2	1.4	0.2	9.9		1.5	0.7
Delay (s)	28.7	25.8	29.2		37.8	4.2
Level of Service	C	C	C		D	A
Approach Delay (s)	27.1		29.2			7.4
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1330	2156	361	219
Future Volume (vph)	1330	2156	361	219
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	111.0	111.0	39.0	39.0
Total Split (%)	74.0%	74.0%	26.0%	26.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	111.5	111.5	29.5	29.5
Actuated g/C Ratio	0.74	0.74	0.20	0.20
v/c Ratio	0.50	0.83	0.58	0.81
Control Delay	9.1	17.4	58.0	75.0
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	9.1	18.7	58.0	75.0
LOS	A	B	E	E
Approach Delay	9.1	18.7	64.4	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 33: Derry Rd & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1330	2156	361	219
v/c Ratio	0.50	0.83	0.58	0.81
Control Delay	9.1	17.4	58.0	75.0
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	9.1	18.7	58.0	75.0
Queue Length 50th (m)	73.5	195.1	46.1	53.0
Queue Length 95th (m)	94.3	249.2	59.6	79.3
Internal Link Dist (m)	67.5	30.8	119.3	
Turn Bay Length (m)				
Base Capacity (vph)	2686	2609	724	314
Starvation Cap Reductn	0	242	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.91	0.50	0.70

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1330	2156	0	361	219
Future Volume (vph)	0	1330	2156	0	361	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3510		3148	1309
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3510		3148	1309
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1330	2156	0	361	219
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	0	1330	2156	0	361	205
Heavy Vehicles (%)	0%	1%	4%	0%	10%	22%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		110.0	110.0		27.0	27.0
Effective Green, g (s)		111.5	111.5		29.5	29.5
Actuated g/C Ratio		0.74	0.74		0.20	0.20
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2686	2609		619	257
v/s Ratio Prot		0.37	c0.61		0.11	
v/s Ratio Perm						c0.16
v/c Ratio		0.50	0.83		0.58	0.80
Uniform Delay, d1		7.8	12.8		54.7	57.4
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.7	3.2		1.4	15.8
Delay (s)		8.5	16.0		56.1	73.2
Level of Service		A	B		E	E
Approach Delay (s)		8.5	16.0		62.5	
Approach LOS		A	B		E	

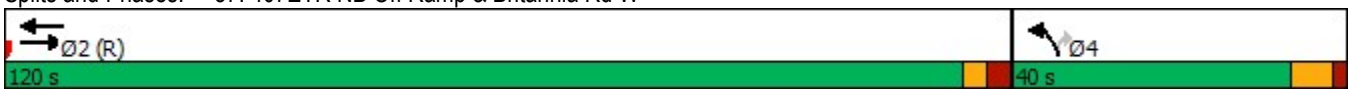
Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Traffic Volume (vph)	1439	1974	197	118
Future Volume (vph)	1439	1974	197	118
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	120.0	120.0	40.0	40.0
Total Split (%)	75.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	123.7	123.7	27.3	27.3
Actuated g/C Ratio	0.77	0.77	0.17	0.17
v/c Ratio	0.52	0.71	0.72	0.36
Control Delay	8.2	11.8	76.9	24.1
Queue Delay	0.3	2.8	0.0	0.0
Total Delay	8.5	14.6	76.9	24.1
LOS	A	B	E	C
Approach Delay	8.5	14.6	57.1	
Approach LOS	A	B	E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 73.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 37: 407ETR NB Off Ramp & Britannia Rd W



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1439	1974	197	118
v/c Ratio	0.52	0.71	0.72	0.36
Control Delay	8.2	11.8	76.9	24.1
Queue Delay	0.3	2.8	0.0	0.0
Total Delay	8.5	14.6	76.9	24.1
Queue Length 50th (m)	74.4	137.0	55.3	10.4
Queue Length 95th (m)	108.4	197.8	76.8	26.6
Internal Link Dist (m)	85.1	84.1	104.6	
Turn Bay Length (m)				
Base Capacity (vph)	2793	2766	356	407
Starvation Cap Reductn	622	652	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.93	0.55	0.29

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1439	0	0	1974	197	118
Future Volume (vph)	1439	0	0	1974	197	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.5	3.5	3.7	3.5	3.5
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3614			3579	1608	1566
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3614			3579	1608	1566
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1439	0	0	1974	197	118
RTOR Reduction (vph)	0	0	0	0	0	64
Lane Group Flow (vph)	1439	0	0	1974	197	54
Heavy Vehicles (%)	1%	0%	0%	2%	11%	2%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Actuated Green, G (s)	122.2			122.2	24.8	24.8
Effective Green, g (s)	123.7			123.7	27.3	27.3
Actuated g/C Ratio	0.77			0.77	0.17	0.17
Clearance Time (s)	6.0			6.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2794			2767	274	267
v/s Ratio Prot	0.40			c0.55	c0.12	
v/s Ratio Perm						0.03
v/c Ratio	0.52			0.71	0.72	0.20
Uniform Delay, d1	6.8			9.2	62.7	57.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			1.6	8.7	0.4
Delay (s)	7.5			10.8	71.4	57.4
Level of Service	A			B	E	E
Approach Delay (s)	7.5			10.8	66.2	
Approach LOS	A			B	E	

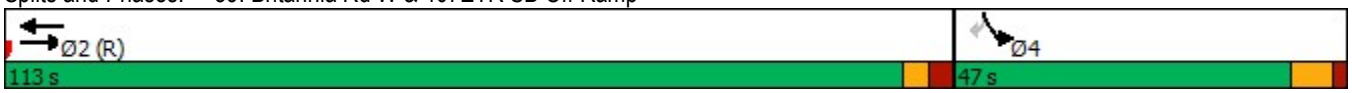
Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Traffic Volume (vph)	1451	2054	164	224
Future Volume (vph)	1451	2054	164	224
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	2	4	
Permitted Phases				4
Detector Phase	2	2	4	4
Switch Phase				
Minimum Initial (s)	12.0	12.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.0	25.0
Total Split (s)	113.0	113.0	47.0	47.0
Total Split (%)	70.6%	70.6%	29.4%	29.4%
Yellow Time (s)	3.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-2.5	-2.5
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	None	None
Act Effct Green (s)	116.6	116.6	34.4	34.4
Actuated g/C Ratio	0.73	0.73	0.22	0.22
v/c Ratio	0.55	0.79	0.45	0.82
Control Delay	11.6	17.9	57.4	77.3
Queue Delay	0.0	1.5	0.0	0.0
Total Delay	11.6	19.4	57.4	77.3
LOS	B	B	E	E
Approach Delay	11.6	19.4	68.9	
Approach LOS	B	B	E	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 39: Britannia Rd W & 407ETR SB Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1451	2054	164	224
v/c Ratio	0.55	0.79	0.45	0.82
Control Delay	11.6	17.9	57.4	77.3
Queue Delay	0.0	1.5	0.0	0.0
Total Delay	11.6	19.4	57.4	77.3
Queue Length 50th (m)	95.2	189.7	41.9	58.1
Queue Length 95th (m)	129.8	255.8	60.1	83.7
Internal Link Dist (m)	64.1	51.2	123.1	
Turn Bay Length (m)				
Base Capacity (vph)	2634	2609	447	334
Starvation Cap Reductn	0	350	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.91	0.37	0.67

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1451	2054	0	164	224
Future Volume (vph)	0	1451	2054	0	164	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3614	3579		1684	1210
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3614	3579		1684	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1451	2054	0	164	224
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	0	1451	2054	0	164	210
Heavy Vehicles (%)	0%	1%	2%	0%	6%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Actuated Green, G (s)		115.1	115.1		31.9	31.9
Effective Green, g (s)		116.6	116.6		34.4	34.4
Actuated g/C Ratio		0.73	0.73		0.21	0.21
Clearance Time (s)		6.0	6.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2633	2608		362	260
v/s Ratio Prot		0.40	c0.57		0.10	
v/s Ratio Perm						c0.17
v/c Ratio		0.55	0.79		0.45	0.81
Uniform Delay, d1		9.8	13.8		54.6	59.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8	2.5		0.9	16.6
Delay (s)		10.7	16.3		55.5	76.2
Level of Service		B	B		E	E
Approach Delay (s)		10.7	16.3		67.5	
Approach LOS		B	B		E	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: Ninth Line & Street B South/Foxwood Ave

04/22/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	25	22	0	17	32	1312	61	43	1334	120
Future Volume (Veh/h)	18	0	25	22	0	17	32	1312	61	43	1334	120
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)	18	0	25	22	0	17	32	1312	61	43	1334	120
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								297				
pX, platoon unblocked	0.71	0.71		0.71	0.71	0.71				0.71		
vC, conflicting volume	2217	2917	727	2184	2946	686	1454			1373		
vC1, stage 1 conf vol	1480	1480		1406	1406							
vC2, stage 2 conf vol	737	1437		778	1540							
vCu, unblocked vol	1893	2883	727	1848	2924	0	1454			701		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	93	88	100	98	93			93		
cM capacity (veh/h)	118	129	366	180	113	772	461			627		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	18	25	22	17	32	875	498	43	889	565
Volume Left	18	0	22	0	32	0	0	43	0	0
Volume Right	0	25	0	17	0	0	61	0	0	120
cSH	118	366	180	772	461	1700	1700	627	1700	1700
Volume to Capacity	0.15	0.07	0.12	0.02	0.07	0.51	0.29	0.07	0.52	0.33
Queue Length 95th (m)	3.6	1.5	2.9	0.5	1.6	0.0	0.0	1.5	0.0	0.0
Control Delay (s)	41.1	15.5	27.8	9.8	13.4	0.0	0.0	11.2	0.0	0.0
Lane LOS	E	C	D	A	B			B		
Approach Delay (s)	26.2		19.9		0.3			0.3		
Approach LOS	D		C							

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		94	144			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				91		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		55	246			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	203			98		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)				88		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		108	104			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)	181			109		
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		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future 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)		75	215			
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				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	22	38	1819	1474	20
Future Volume (Veh/h)	12	22	38	1819	1474	20
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	22	38	1819	1474	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (m)				189	293	
pX, platoon unblocked	0.81	0.80	0.80			
vC, conflicting volume	2470	747	1494			
vC1, stage 1 conf vol	1484					
vC2, stage 2 conf vol	986					
vCu, unblocked vol	1217	180	1115			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	92			
cM capacity (veh/h)	215	665	497			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	22	38	910	910	983	511
Volume Left	12	0	38	0	0	0	0
Volume Right	0	22	0	0	0	0	20
cSH	215	665	497	1700	1700	1700	1700
Volume to Capacity	0.06	0.03	0.08	0.54	0.54	0.58	0.30
Queue Length 95th (m)	1.2	0.7	1.7	0.0	0.0	0.0	0.0
Control Delay (s)	22.8	10.6	12.8	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	14.9		0.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	5	8	1178	1515	57
Future Volume (Veh/h)	12	5	8	1178	1515	57
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	5	8	1178	1515	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)				397	203	
pX, platoon unblocked	0.85	0.79	0.79			
vC, conflicting volume	2148	786	1572			
vC1, stage 1 conf vol	1544					
vC2, stage 2 conf vol	605					
vCu, unblocked vol	1339	190	1188			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	98			
cM capacity (veh/h)	201	646	460			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	12	5	8	589	589	1010	562
Volume Left	12	0	8	0	0	0	0
Volume Right	0	5	0	0	0	0	57
cSH	201	646	460	1700	1700	1700	1700
Volume to Capacity	0.06	0.01	0.02	0.35	0.35	0.59	0.33
Queue Length 95th (m)	1.3	0.2	0.4	0.0	0.0	0.0	0.0
Control Delay (s)	24.1	10.6	13.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	20.1		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	15	28	1236	1456	48
Future Volume (Veh/h)	25	15	28	1236	1456	48
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)	25	15	28	1236	1456	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					384	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	2154	752	1504			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1873	5	1007			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	45	98	95			
cM capacity (veh/h)	45	808	513			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	25	15	28	618	618	971	533
Volume Left	25	0	28	0	0	0	0
Volume Right	0	15	0	0	0	0	48
cSH	45	808	513	1700	1700	1700	1700
Volume to Capacity	0.55	0.02	0.05	0.36	0.36	0.57	0.31
Queue Length 95th (m)	14.4	0.4	1.2	0.0	0.0	0.0	0.0
Control Delay (s)	157.8	9.5	12.4	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	102.2		0.3			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

2041 Synchro Results – Scenario 2

Appendix G

2041 Synchro Results – Scenario 3

Appendix H

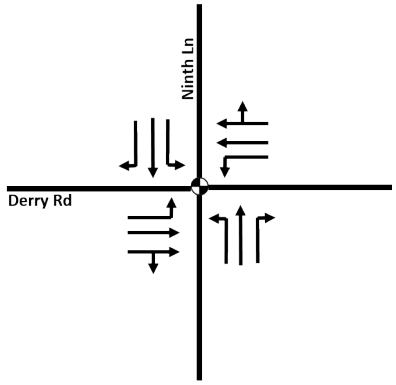
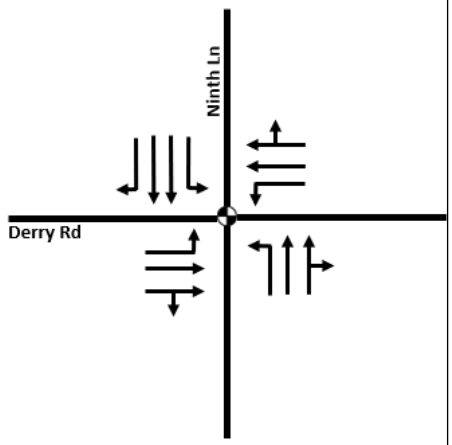
Roundabout Assessment

Region of Peel
Roundabout Feasibility Screening Tool

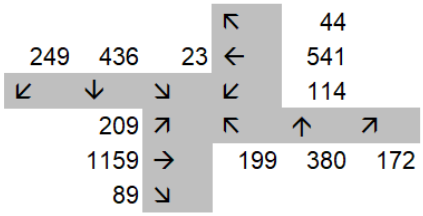
		Roundabout Supportive?
1)	Project name, File #, Intersection Location (B/C/M, Street name, distance from major intersections, etc.): Ninth Line and Derry Road Distances from major intersections • N-S: 1250 m south of Ninth Line and Canadian Pacific Railway and 700 m north of Ninth Line and Beacham Street. o Beacham Street is recommended for signalization for 2041. If left unsignalized, the next signalized intersection is nearly 1300 m away at Doug Leavens Boulevard • E-W: 230 m east of Derry Road 407 East Ramp and 375 m west of Derry Road and Rosehurst Drive/Lisgar Drive	
2)	Brief description of Intersection (No. of legs, Lanes on each leg, Total AADT, ADDT on each road). Attach or sketch a diagram of existing and horizon year TMCs:	**NEUTRAL** ☐

4 -legged signal controlled intersection, 2 lanes per direction along Derry Road (E-W), 1 lane per direction along Ninth Line (N-S)

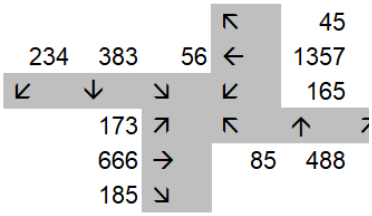
Existing Average AADT: N-S: 14,900, E-W: 23,900
Future Average AADT (Widening): N-S: 29,30, E-W: 32,800

Existing Lane Configuration	Future Lane Configuration
	

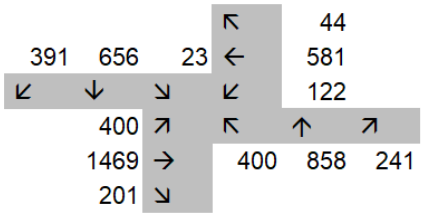
Derry Existing AM Peak Hour



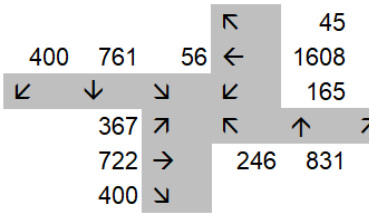
Derry Existing PM Peak Hour



Derry 2041 AM Peak Hour



Derry 2041 PM Peak Hour

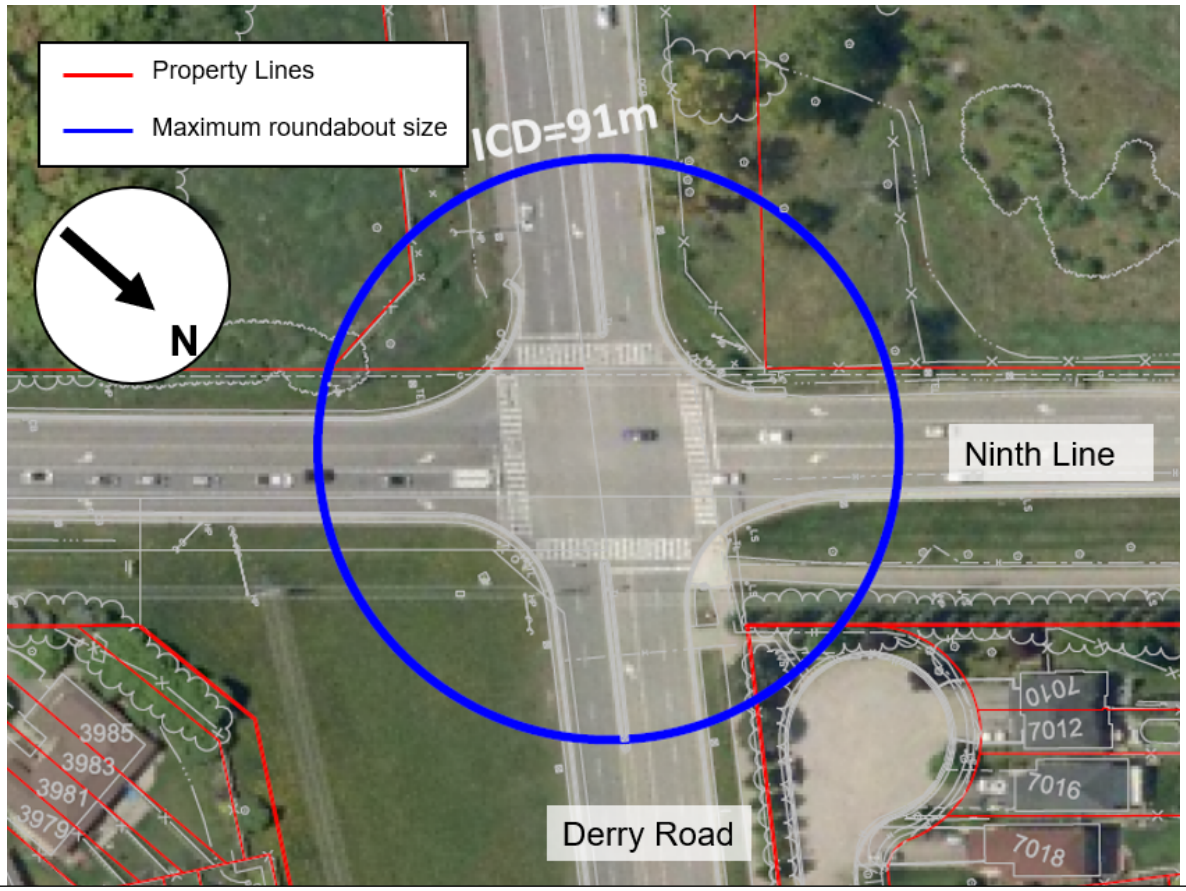


3)	What operational problems are being experienced at this location? Existing AM peak hour operates at LOS D • Critical movements: EBL (LOS E, v/c 0.74), EBT (LOS E, v/c 0.94), WBL (LOS E, v/c 0.75) Existing PM peak hour operates at LOS D • Critical movements: EBL (LOS F, v/c 0.92), WBL (LOS E, 0.72), WBT (LOS E, 0.97)	**NEUTRAL** ☐
4)	Is it a new intersection or a retrofit of an existing intersection? If existing, what is the existing type of traffic control? The intersection is existing with signalized control.	**NO** ☐
5)	Is the intersection near a major intersection or a railroad crossing? If so, how close and what type of traffic control exists at the adjacent intersection(s)? Will queues be a problem? Describe the corridor (eg.: average intersection spacing). Distances from major intersections • N-S: 1250 m south of Ninth Line and Canadian Pacific Railway and 700 m north of Ninth Line and Beacham Street. o Beacham Street is recommended for signalization for 2041. If left unsignalized, the next signalized intersection is nearly 1300 m away at Doug Leavens Boulevard • E-W: 230 m east of Derry Road 407 East Ramp and 375 m west of Derry Road and Rosehurst Drive/Lisgar Drive 95th percentile queue lengths for both peak periods during 2041 future conditions are expected to be less than 330m and would not spillback into adjacent signalized intersections. There is concern for the 2041 AM EB queue which is expected to be 290 m to exceed the Highway 407 east ramp 230 m away.	**NO** ☐
6)	Would the intersection be located within a coordinated signal network? It is unknown if Ninth Line is to officially be considered a coordinated signal network; however, opportunities for coordination exist along the corridor if left as a signalized intersection Britannia Road and Derry Road also have signal coordination opportunities along its corridors, but the proximity of signalized Highway 407 ramps should be considered prior to roundabout implementation. In addition, it could be acceptable to have the intersection at Ninth Line be uncoordinated as it is located at the western limit of City of Mississauga's border.	**NEUTRAL** ☐

7)	Would the intersection be located on a preferred roundabout corridor? If yes why? Unknown	**NEUTRAL** ☐
8)	What is the collision history of the intersection over the past five years? Is there a collision problem that needs to be addressed? There are 36 collisions reported in the past 5 years, between January 1, 2014 to Dec 31, 2019. 39% of collisions at this intersection are related to angle and turning movements. The average collision rate at Derry Road is 0.33 (collisions per million vehicles per year), which is higher than the average 0.12 for all intersections within the study area. Mini or single lane roundabout might be able to reduce some of the collisions like angle collisions, but there is not enough evidence that three-lane roundabouts could help reduce collisions. To the contrary, some research suggested that inappropriate lane changes resulted in higher than expected crash rate at the four three-lane roundabouts in Michigan[1].	**NEUTRAL** ☐
9)	Is the intersection scheduled for improvements or is it located within a corridor that is scheduled for improvements in the next 10 years? What is the ultimate cross-section of the approaching legs? Yes, Ninth Line was planned for widening from two to four lanes between Eglinton Avenue and Derry Road (within 10 years), and then North of Derry Road (beyond 10 years), according to City's 2019 Development Charges Update Transportation Background Study. The approach leg from the 407 East Ramp to Derry Road will require realignment/reconstruction to accommodate for future 2041 AM EB queue that is expected to be 290 m long, exceeding the Highway 407 east ramp 230 m away.	**NO** ☐

[1] An Evaluation of Signing for Three-Lane Roundabouts: https://www.fhwa.dot.gov/publications/research/safety/10030/10030.pdf

10)	Are there expected to be special users at this intersection in the near future (ie. a person with disability, pedestrians, cyclists, large agricultural machinery, horses, etc.)? If yes, what special considerations would be required? The urban form of Ninth Line is expected to transform in the future as a result of new developments on the west side. The road and study area must be able to accommodate all users and travel modes with equity, safety, and efficiency in mind. Pedestrian and cyclist interactions at roundabouts will be a key consideration. Although Ninth Line is not designated as a corridor in the Strategic Goods Movement network, Derry Road is a truck route. Consideration may be required for large truck interaction at the intersection with roundabout control.	**NO** ☐
11)	What traditional improvements are proposed for this intersection (traffic signals, all-way stop, auxiliary lanes, off-set re-alignment, etc)? Auxiliary eastbound right and southbound right turn lanes are proposed for this intersection by the 2041 horizon. Signal timing changes include protected EBL phase during AM peak, protected WBL and SBL phase during PM Peak, and signal optimization	**NEUTRAL** ☐
12)	If traffic signals are considered, does it meet the warrant for the horizon year? Existing intersection is already signalized	**NEUTRAL** ☐
13)	What size of roundabout is being considered for this intersection (ie. single, two, three lane entry)? Please attach a Traffic Flow Worksheet, a lane configuration diagram and a sketch of how a roundabout would fit into the ROW. Based on the output of the Traffic Flow Worksheet, a three-lane entry roundabout will be required at this intersection. The maximum inscribed circle diameter (ICD) of the roundabout will be 91m which allows for a three-lane entry roundabout. This would be a very large roundabout and may be difficult for users to travel through, especially as the first multi lane roundabout in Mississauga.	**NO** ☐

14)	Are there property constraints at/near the intersection or is it restricted by a watercourse/parks/cemeteries/etc? If yes, what are they? WB-20 vehicles were used to assess the space required for a roundabout as Derry Road is part of the goods movement route identified by Peel Region. A three-lane roundabout based on a WB-20 vehicle requires a 67 to 91 metre common inscribed circle diameter range[2]. The 91m maximum diameter was used to determine if property constraints exist. Based on the preliminary review below, there are some property constraints.  	**NO** ☐
15)	Terrain – Is the area on a grade/flat/rolling? Flat terrain in all four quadrants	**YES** ☐

[2] https://nacto.org/docs/usdg/nchrprpt672.pdf

16) 20 Year Life Cycle Cost Estimate

Injury Collision Cost (ICC): _____

Discount Rate (i): _____

YES ☐
NO ☐
NEUTRAL ☐

20 YEAR LIFE- CYCLE COST COMPARISON		
Cost Item	Other Traffic Control	Roundabout
Implementation Cost	$	$
Injury Collision Cost (Present Value)	$	$
Total Life Cycle Cost	$	$

Notes:

- Implementation Cost
  = sum of costs for construction, property, utility relocation, illumination, engineering (20%), contingency (20%) and maintenance (5%)
- Present Value of 20 Year Injury Collision Cost
  = expected annual collision frequency x ICC $((1+i)^{20}-1)/i(1+i)^{20}$
- Monte Carlo Analysis may be required. If so, a range for the implementation cost (i.e. 10%, 50%, 90% probability) is required

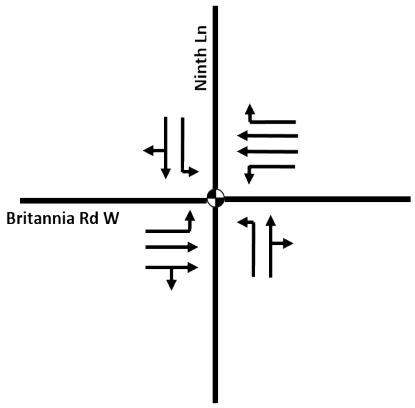
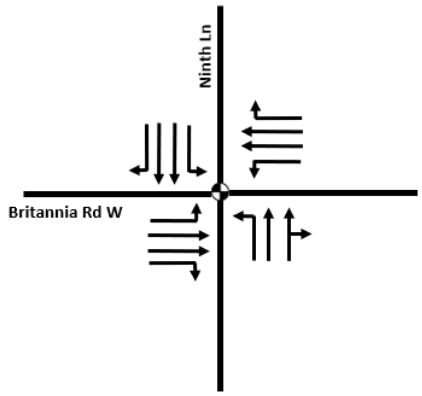
17)	Conclusions and Recommendations: Based on the traffic flow sheet, a three-lane entry roundabout will likely be required to accommodate vehicle volumes. A three-lane roundabout using a WB-20 vehicle would have a ICD up to 91m based on NCHRP report. Some minor property impacts are expected; however, specific property impacts will have to be confirmed. The potential roundabout is located 230 m east of the 407 East Ramp and there is concern for the 2041 AM EB queue that is expected to be 290 m long, resulting in spill backs onto the roundabout. This may require realignment/reconstruction of the east ramp or shift roundabout further east from Ninth Line, which creates more property impacts. As Mississauga has few roundabouts and no multi-lane roundabouts present today, road users maybe be unfamiliar with them, especially for multi-lane roundabouts. Pedestrians and cyclists may also find multi-lane roundabouts difficult to cross as well. Public education and consultation should be considered before any implementation. Impacts for heavy vehicles using Derry Road as part of Strategic Goods Movement corridor should also need to be considered. Based on the above listed points and preliminary review, this intersection is recommended not to be considered for roundabout control to better support all modes of travel.	**NO**☐

Region of Peel
Roundabout Feasibility Screening Tool

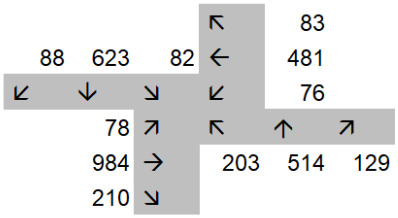
		Roundabout Supportive?
1)	Project name, File #, Intersection Location (B/C/M, Street name, distance from major intersections, etc.): Ninth Line and Britannia Road Distances from **major** intersections N-S: 640m south of Ninth Line and Osprey Boulevard and 370m north of Ninth Line and McDowell Drive. o McDowell Drive is recommended for signalization for 2041. If left unsignalized, the next signalized intersection is nearly 1 km away at Thomas Street • E-W: 220 m east of Britannia Road 407 East Ramp and 475 m west of Britannia Road and Maple Gate Crescent / Churchill Meadows Boulevard	
2)	Brief description of Intersection (No. of legs, Lanes on each leg, Total AADT, ADDT on each road). Attach or sketch a diagram of existing and horizon year TMCs:	**NEUTRAL** ☐

4 -legged signal controlled intersection, 2 lanes per direction along Britannia Road (E-W), 1 lane per direction along Ninth Line (N-S)

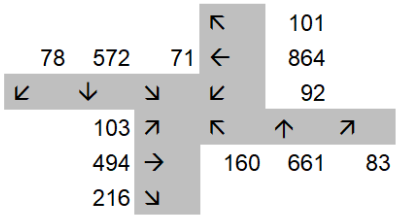
Existing Average AADT: N-S: 18,400, E-W: 19,800
Future Average AADT (Widening): N-S: 39,800, E-W: 30,500

Existing Lane Configuration	Future Lane Configuration
	

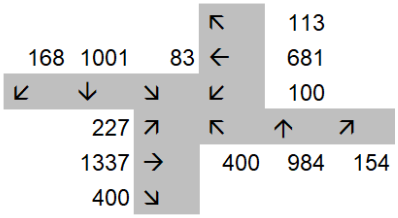
Britannia Existing AM Peak Hour



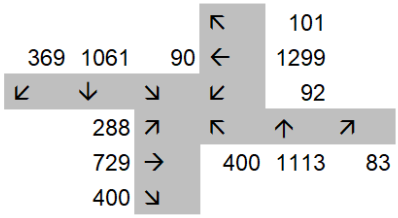
Britannia Existing PM Peak Hour



Britannia 2041 AM Peak Hour



Britannia 2041 PM Peak Hour



3) What operational problems are being experienced at this location?

Existing AM peak hour operates at LOS E

- Critical movements: EBT (LOS E, v/c 1.03), NBL (LOS F, v/c 1.13), SBT (LOS E, v/c 0.96)

PM peak hour operates at LOS D

- Critical movements: WBT (LOS e, v/c 1.00)

NEUTRAL ☐

4)	Is it a new intersection or a retrofit of an existing intersection? If existing, what is the existing type of traffic control? The intersection is existing with signalized control	**NO** ☐
5)	Is the intersection near a major intersection or a railroad crossing? If so, how close and what type of traffic control exists at the adjacent intersection(s)? Will queues be a problem? Describe the corridor (eg.: average intersection spacing). Distances from major intersections • N-S: 640 m south of Ninth Line and Osprey Boulevard and 370m north of Ninth Line and McDowell Drive. ○ McDowell Drive is currently two way-stop control for the minor street and recommended for signalization for 2041. If left unsignalized, the next signalized intersection is nearly 1 km away at Thomas Street • E-W: 220 m east of Britannia Road 407 East Ramp and 475 m west of Britannia Road and Maple Gate Crescent / Churchill Meadows Boulevard 95th queue lengths for both peak periods during 2041 future conditions are expected to be less than 300m and would not spillback into adjacent signalized intersections. There is some concern for the 2041 AM EB queue which is expected to be 240 m to exceed the Highway 407 east ramp 220 m away.	**NO** ☐
6)	Would the intersection be located within a coordinated signal network? It is unknown if Ninth Line is to officially be considered a coordinated signal network; however, opportunities for coordination exist along the corridor if left as a signalized intersection Britannia Road and Derry Road also have signal coordination opportunities along its corridors, but the proximity of signalized Highway 407 ramps should be considered prior to roundabout implementation. In addition, it could be acceptable to have the intersection at Ninth Line be uncoordinated as it is located at the western limit of City of Mississauga's border.	**NEUTRAL** ☐
7)	Would the intersection be located on a preferred roundabout corridor? If yes why? Unknown	**NEUTRAL** ☐

8)	What is the collision history of the intersection over the past five years? Is there a collision problem that needs to be addressed? There are 41 collisions reported in the past 5 years, between January 1, 2014 to Dec 31, 2019. 37% of collisions at this intersection are related to angle and turning movements, which can potentially be reduced with the implementation of a roundabout. The average collision rate at Britannia Road Road is 0.38 (collisions per million vehicles per year), which is higher than the average 0.12 for all intersections within the study area. Mini or single lane roundabout might be able to reduce some of the collisions like angle collisions, but there is not enough evidence that three-lane roundabouts could help reduce collisions. To the contrary, some research suggested that inappropriate lane changes resulted in higher than expected crash rate at the four three-lane roundabouts in Michigan[1].	**NEUTRAL** ☐
9)	Is the intersection scheduled for improvements or is it located within a corridor that is scheduled for improvements in the next 10 years? What is the ultimate cross-section of the approaching legs? Yes, Ninth Line was planned for widening from two to four lanes between Eglinton Avenue and Derry Road (within 10 years), and then North of Derry Road (beyond 10 years), according to City's 2019 Development Charges Update Transportation Background Study. The approach leg from the 407 East Ramp to Britannia Road will require realignment/reconstruction to accommodate for future 2041 AM EB queue that is expected to be 240 m long, exceeding the Highway 407 east ramp 220 m away.	**NO** ☐
10)	Are there expected to be special users at this intersection in the near future (ie. a person with disability, pedestrians, cyclists, large agricultural machinery, horses, etc.)? If yes, what special considerations would be required? The urban form of Ninth Line is expected to transform in the future as a result of new developments on the west side. The road and study area must be able to accommodate all users and travel modes with equity, safety, and efficiency in mind. Pedestrian and cyclist interactions at roundabouts will be a key consideration. It is to be noted trucks are also observed at this location from the counts; however, neither Ninth Line or Britannia Road is designated as a corridor in the Strategic Goods Movement network. Consideration may also be required for truck interaction at the intersection	**NO**☐

[1] An Evaluation of Signing for Three-Lane Roundabouts: https://www.fhwa.dot.gov/publications/research/safety/10030/10030.pdf

11)	What traditional improvements are proposed for this intersection (traffic signals, all-way stop, auxiliary lanes, off-set re-alignment, etc)? Auxiliary eastbound right and southbound right turn lanes are proposed for this intersection by the 2041 horizon. Signal will also be optimized for the future	**NEUTRAL** ☐
12)	If traffic signals are considered, does it meet the warrant for the horizon year? Existing intersection is already signalized	**NEUTRAL** ☐
13)	What size of roundabout is being considered for this intersection (ie. single, two, three lane entry)? Please attach a Traffic Flow Worksheet, a lane configuration diagram and a sketch of how a roundabout would fit into the ROW. Based on the output of the Traffic Flow Worksheet, a three-lane entry roundabout will be required at this intersection. The maximum inscribed circle diameter (ICD) of the roundabout will be 91m which allows for a three-lane entry roundabout. This would be a very large roundabout and may be difficult for users to travel through, especially as the first multi lane roundabout in Mississauga.	**NO**☐

14)	Are there property constraints at/near the intersection or is it restricted by a watercourse/parks/cemeteries/etc? If yes, what are they? WB-20 vehicles were used to assess the space required for a roundabout as Derry Road is part of the goods movement route identified by Peel Region. A three-lane roundabout based on a WB-20 vehicle requires a 67 to 91 metre common inscribed circle diameter range[2]. The 91m maximum diameter was used to determine if property constraints exist. Based on the preliminary review below, there are some property constraints. 	**NO** ☐
15)	Terrain – Is the area on a grade/flat/rolling? Flat terrain in all four quadrants	**YES** ☐

[2] https://nacto.org/docs/usdg/nchrprpt672.pdf

16) 20 Year Life Cycle Cost Estimate

Injury Collision Cost (ICC): _____

Discount Rate (i): _____

YES ☐
NO ☐
NEUTRAL ☐

20 YEAR LIFE- CYCLE COST COMPARISON		
Cost Item	Other Traffic Control	Roundabout
Implementation Cost	$	$
Injury Collision Cost (Present Value)	$	$
Total Life Cycle Cost	$	$

Notes:

- Implementation Cost
  = sum of costs for construction, property, utility relocation, illumination, engineering (20%), contingency (20%) and maintenance (5%)
- Present Value of 20 Year Injury Collision Cost
  = expected annual collision frequency x ICC $((1+i)^{20}-1)/i(1+i)^{20}$
- Monte Carlo Analysis may be required. If so, a range for the implementation cost (i.e. 10%, 50%, 90% probability) is required

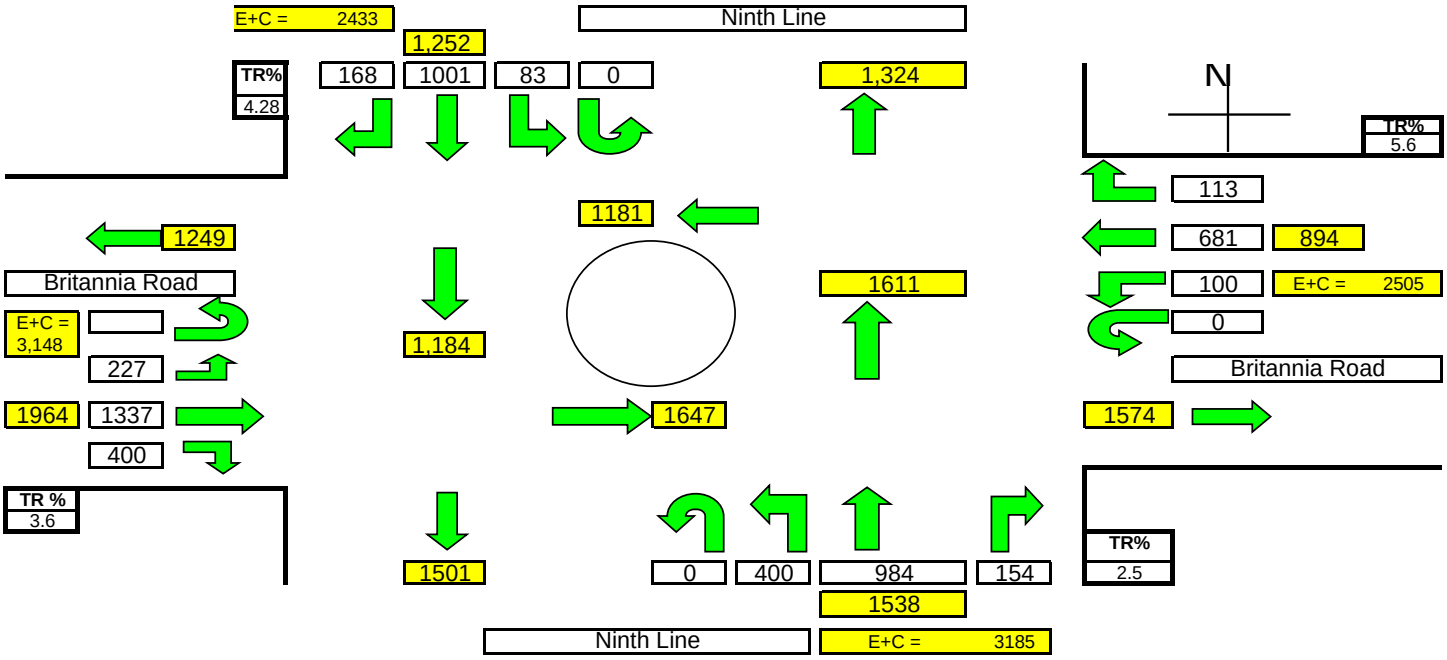
17)	Conclusions and Recommendations: Based on the traffic flow sheet, a three-lane entry roundabout will likely be required to accommodate vehicle volumes. A three-lane roundabout using a WB-20 vehicle would have a ICD up to 91m based on NCHRP report. Some minor property impacts are expected; however, specific property impacts will have to be confirmed. The potential roundabout is located 220 m east of the 407 East Ramp and there is concern for the 2041 AM EB queue that is expected to be 240 m long, resulting in spill backs onto the roundabout. This may require realignment/reconstruction of the east ramp or shift roundabout further east from Ninth Line, which creates more property impacts. As Mississauga has few roundabouts and no multi-lane roundabouts present today, road users maybe be unfamiliar with them, especially for multi-lane roundabouts. Pedestrians and cyclists may also find multi-lane roundabouts difficult to cross as well. Public education and consultation should be considered before any implementation. Based on the above listed points and preliminary review, this intersection is recommended not to be considered for roundabout control to better support all modes of travel.	**NO**☐

REGION OF PEEL ROUNDABOUT TRAFFIC FLOW SHEET

VERSION 1.0

Project: Ninth Line EA
Project No.:
Intersection: Britannia Road at Ninth Line
Time Period: AM PEAK 2041

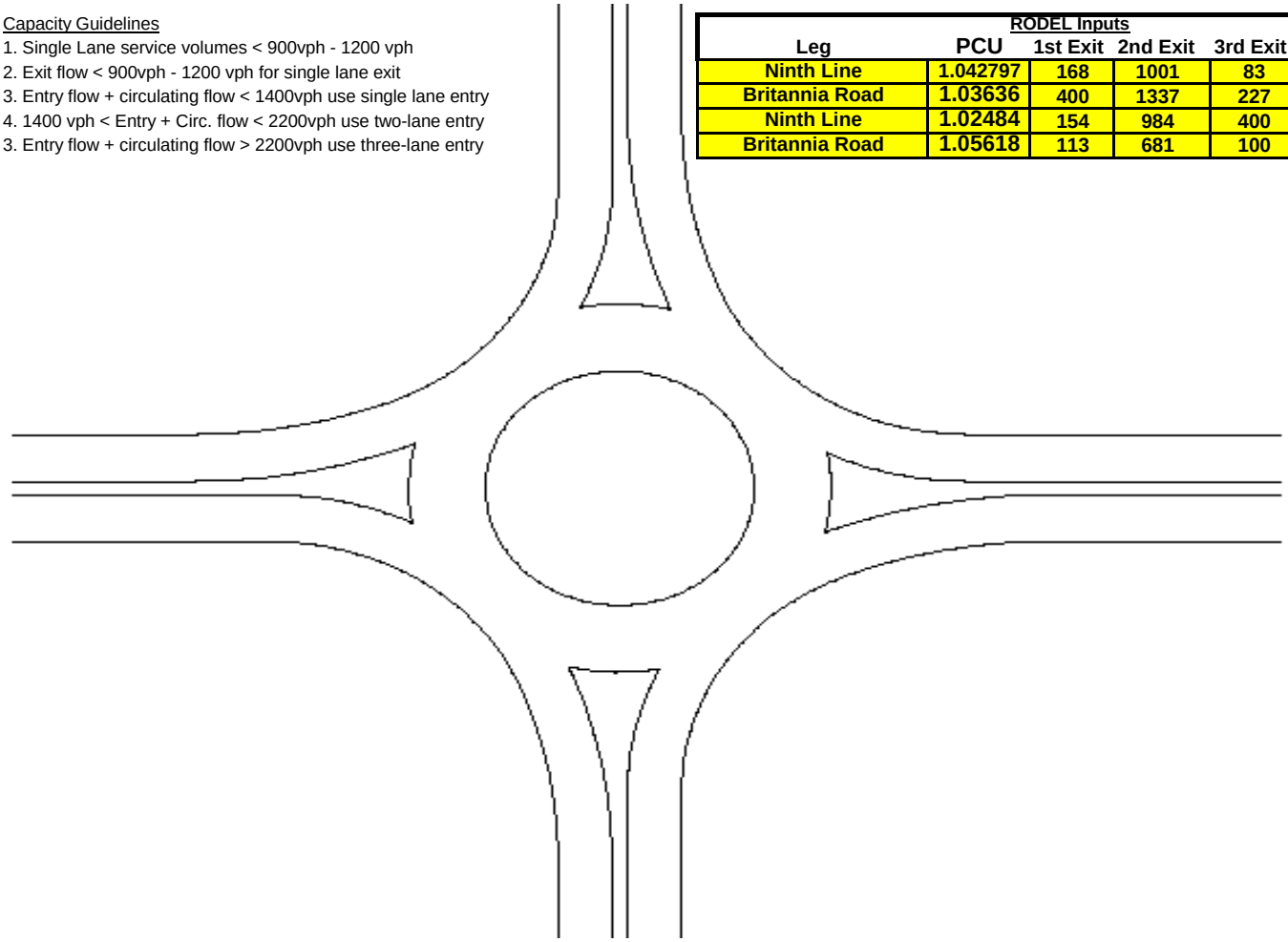
Drawn By: HDR
Sheet **of**



Capacity Guidelines
1. Single Lane service volumes < 900vph - 1200 vph
2. Exit flow < 900vph - 1200 vph for single lane exit
3. Entry flow + circulating flow < 1400vph use single lane entry
4. 1400 vph < Entry + Circ. flow < 2200vph use two-lane entry
3. Entry flow + circulating flow > 2200vph use three-lane entry

RODEL Inputs

Leg	PCU	1st Exit	2nd Exit	3rd Exit	U-turn
Ninth Line	1.042797	168	1001	83	0
Britannia Road	1.03636	400	1337	227	0
Ninth Line	1.02484	154	984	400	0
Britannia Road	1.05618	113	681	100	0

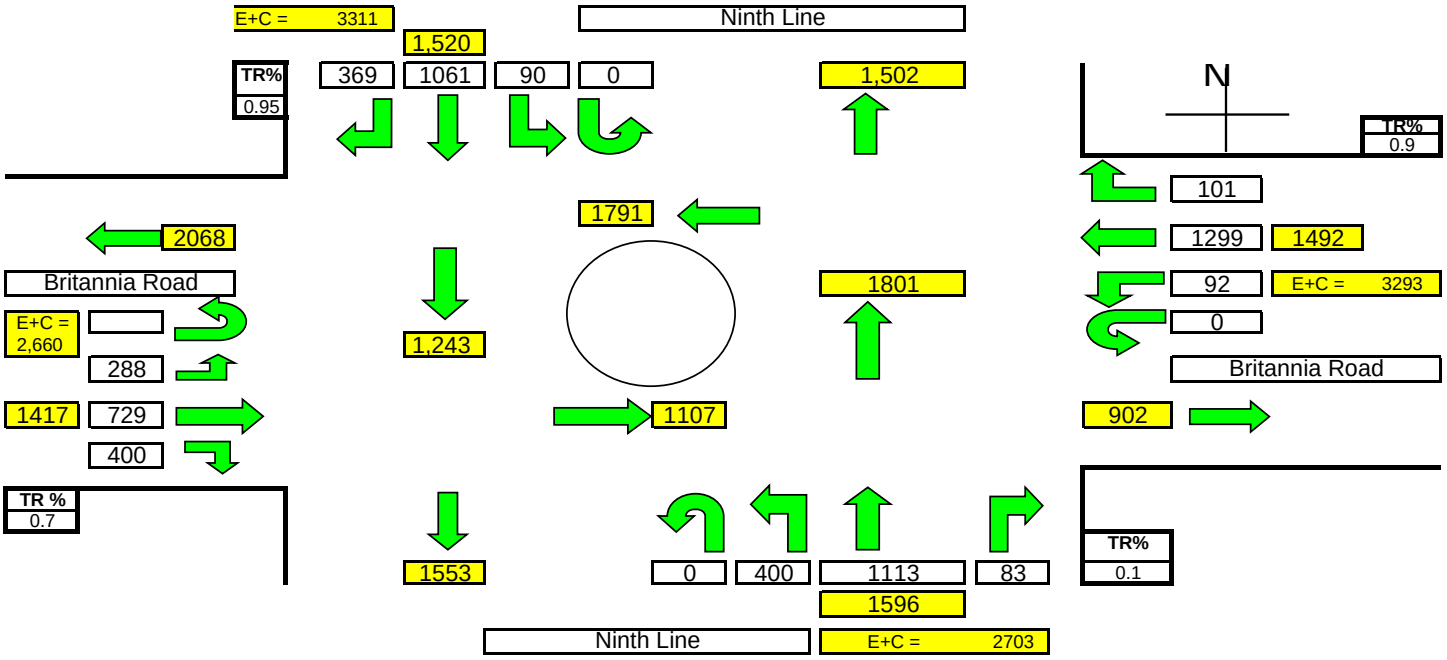


REGION OF PEEL ROUNDABOUT TRAFFIC FLOW SHEET

VERSION 1.0

Project: Ninth Line EA
Project No.:
Intersection: Britannia Road at Ninth Line
Time Period: PM PEAK 2041

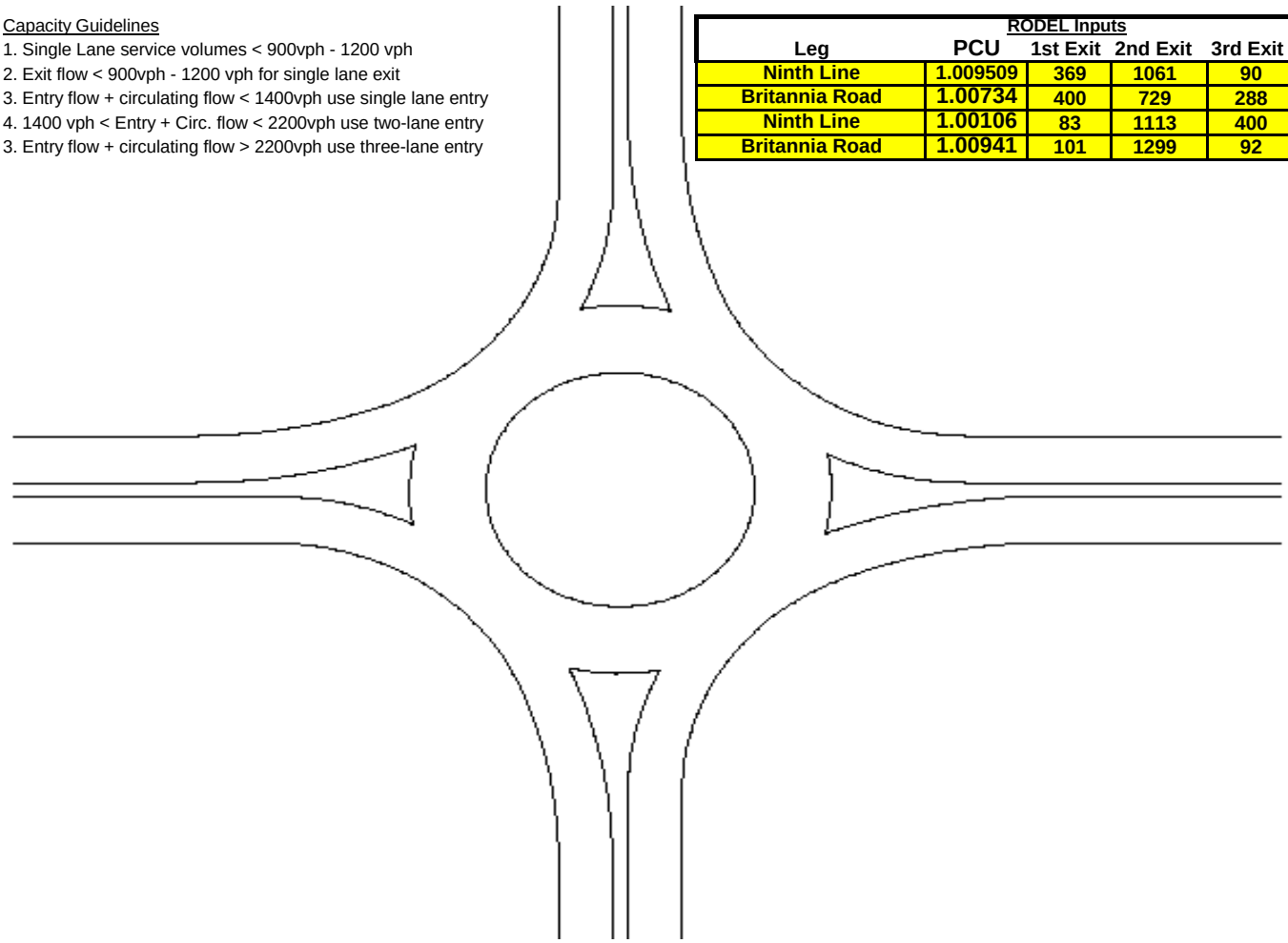
Drawn By: HDR
Sheet **of**



Capacity Guidelines
1. Single Lane service volumes < 900vph - 1200 vph
2. Exit flow < 900vph - 1200 vph for single lane exit
3. Entry flow + circulating flow < 1400vph use single lane entry
4. 1400 vph < Entry + Circ. flow < 2200vph use two-lane entry
3. Entry flow + circulating flow > 2200vph use three-lane entry

RODEL Inputs

Leg	PCU	1st Exit	2nd Exit	3rd Exit	U-turn
Ninth Line	1.009509	369	1061	90	0
Britannia Road	1.00734	400	729	288	0
Ninth Line	1.00106	83	1113	400	0
Britannia Road	1.00941	101	1299	92	0

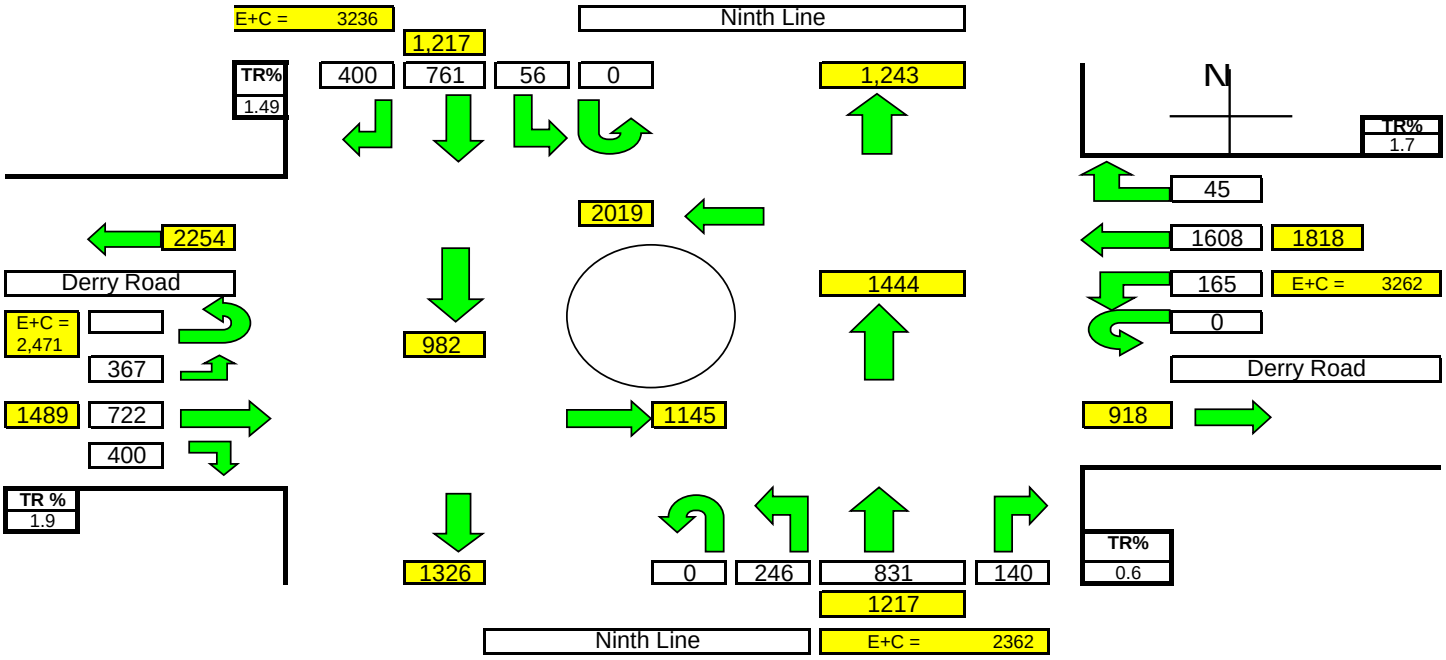


REGION OF PEEL ROUNDABOUT TRAFFIC FLOW SHEET

VERSION 1.0

Project: Ninth Line EA
Project No.:
Intersection: Britannia Road at Ninth Line
Time Period: PM PEAK 2041

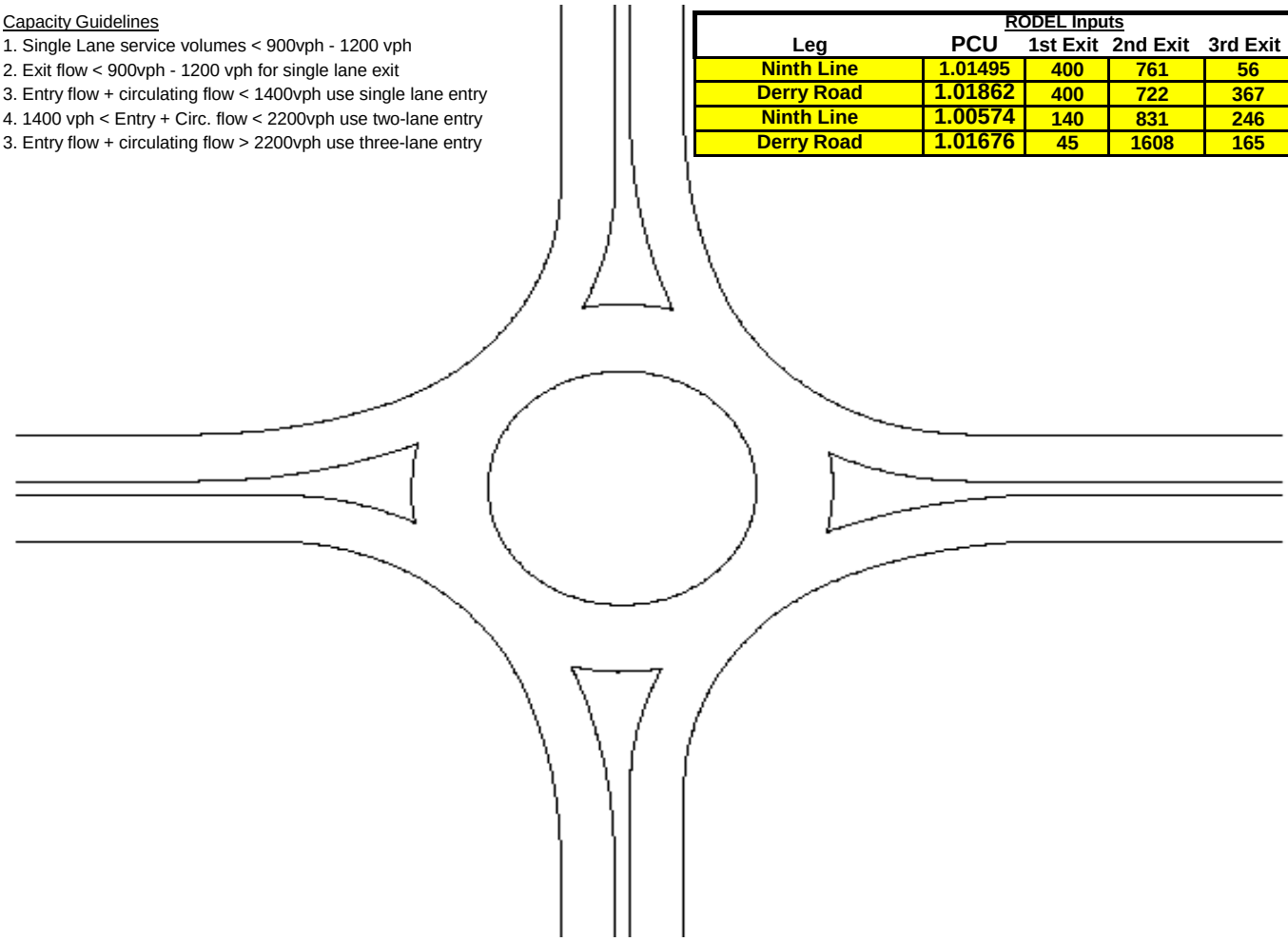
Drawn By: HDR
Sheet **of**



Capacity Guidelines
1. Single Lane service volumes < 900vph - 1200 vph
2. Exit flow < 900vph - 1200 vph for single lane exit
3. Entry flow + circulating flow < 1400vph use single lane entry
4. 1400 vph < Entry + Circ. flow < 2200vph use two-lane entry
3. Entry flow + circulating flow > 2200vph use three-lane entry

RODEL Inputs

Leg	PCU	1st Exit	2nd Exit	3rd Exit	U-turn
Ninth Line	1.01495	400	761	56	0
Derry Road	1.01862	400	722	367	0
Ninth Line	1.00574	140	831	246	0
Derry Road	1.01676	45	1608	165	0

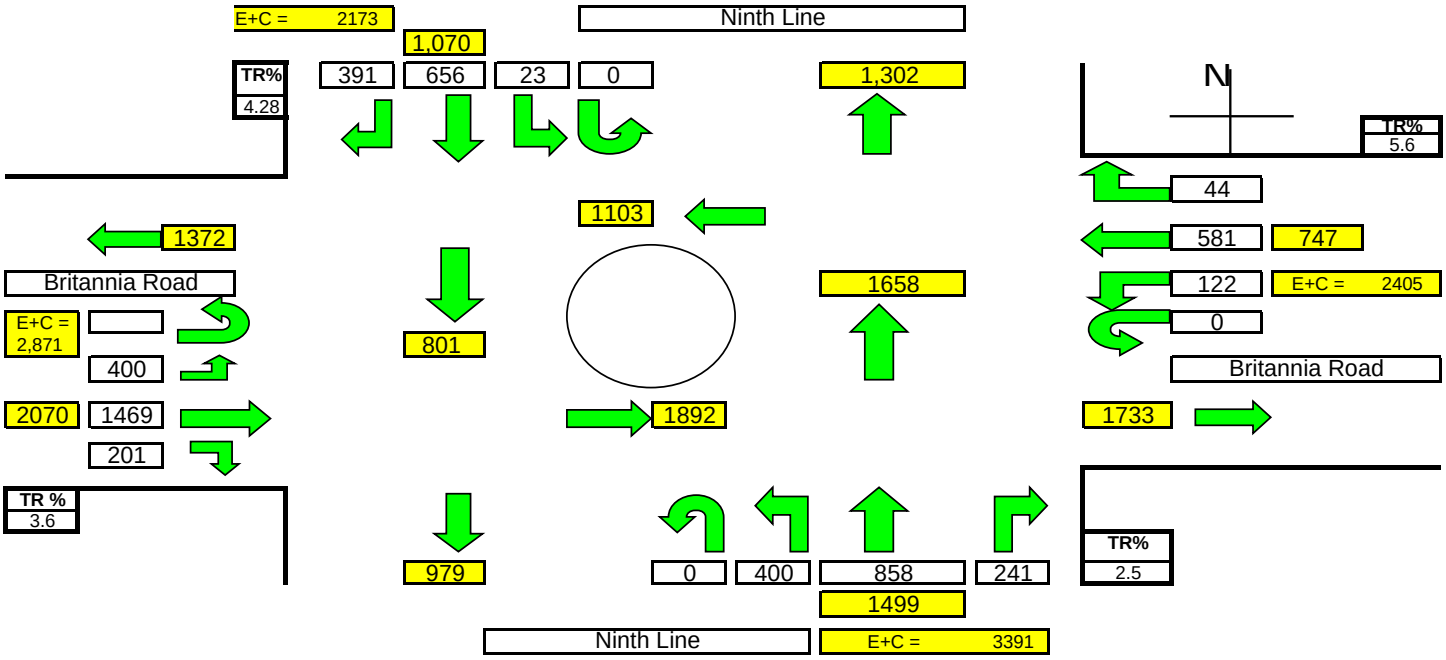


REGION OF PEEL ROUNDABOUT TRAFFIC FLOW SHEET

VERSION 1.0

Project: Ninth Line EA
Project No.:
Intersection: Britannia Road at Ninth Line
Time Period: AM PEAK 2041

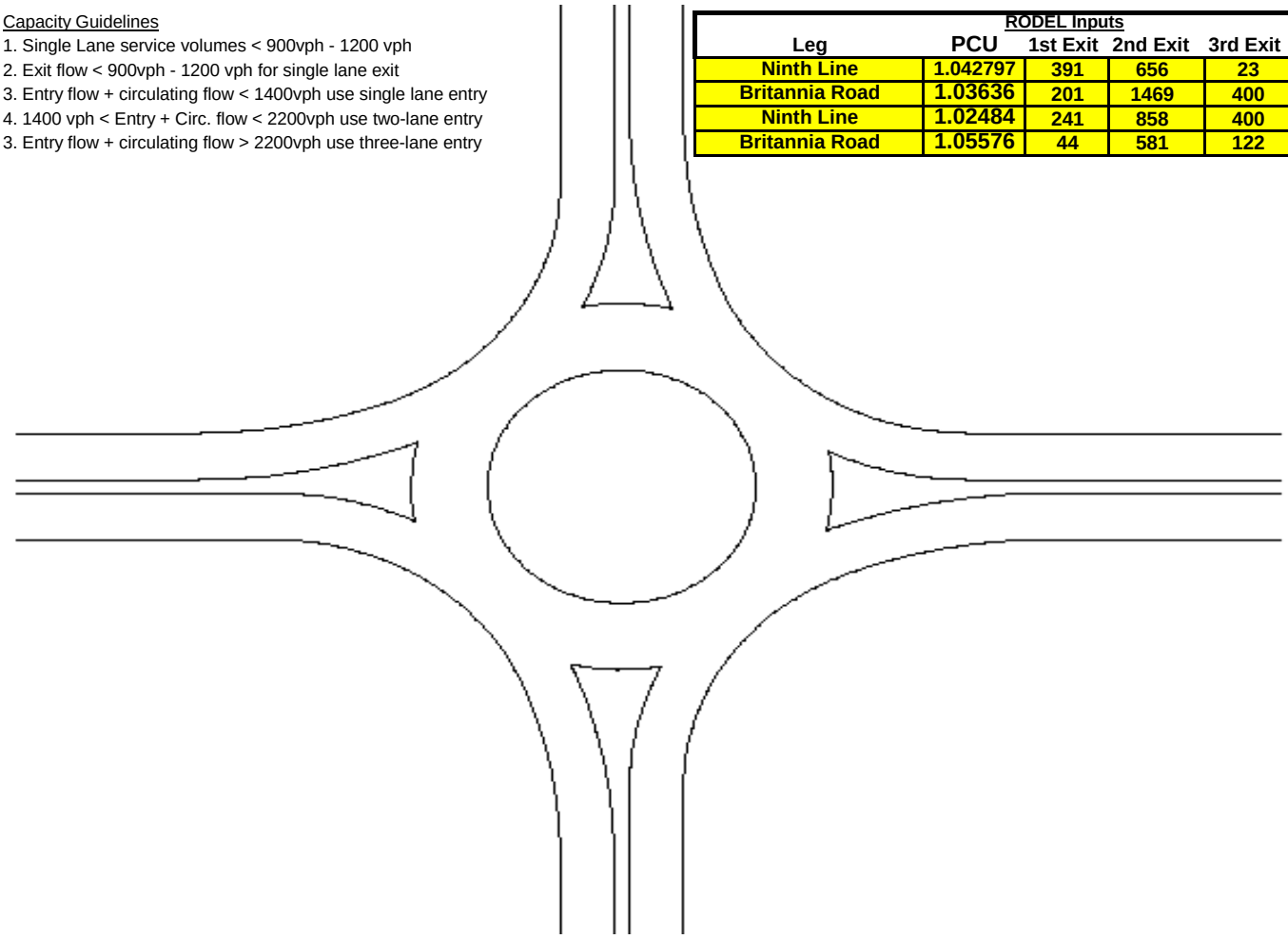
Drawn By: HDR
Sheet **of**



Capacity Guidelines
1. Single Lane service volumes < 900vph - 1200 vph
2. Exit flow < 900vph - 1200 vph for single lane exit
3. Entry flow + circulating flow < 1400vph use single lane entry
4. 1400 vph < Entry + Circ. flow < 2200vph use two-lane entry
3. Entry flow + circulating flow > 2200vph use three-lane entry

RODEL Inputs

Leg	PCU	1st Exit	2nd Exit	3rd Exit	U-turn
Ninth Line	1.042797	391	656	23	0
Britannia Road	1.03636	201	1469	400	0
Ninth Line	1.02484	241	858	400	0
Britannia Road	1.05576	44	581	122	0



Appendix I

MMLOS Methodology

Pedestrian Level of Service: Segments

Sidewalk Width (m)	Boulevard Width (m)	Motor Vehicle Traffic Volume (AADT)	Presence of On- street Parking	Segment PLOS			
				Operating Speed (km/h)			
				≤30	>30 or 50	>50 or 60	>60 [1]
2.0 or more	> 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	B	N/A
			No	A	B	C	D
	0.5 to 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	C	N/A
			No	A	C	D	E
	0	≤ 3000	NA	A	B	C	D
		> 3000	Yes	B	B	D	N/A
			No	B	C	E	F
1.8	> 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	C	N/A
			No	A	C	D	E
	0.5 to 2	≤ 3000	N/A	A	B	B	D
		> 3000	Yes	A	C	C	N/A
			No	B	C	E	E
	0	≤ 3000	N/A	A	B	C	D
		> 3000	Yes	B	C	D	N/A
			No	C	D	F	F
1.5	> 2	≤ 3000	N/A	C	C	C	C
		> 3000	Yes	C	C	D	N/A
			No	C	D	E	E
	0.5 to 2	≤ 3000	N/A	C	C	C	D
		> 3000	Yes	C	C	D	N/A
			No	D	E	E	E
	0	N/A		D	E	F [2]	F [2]
<1.5	N/A			F [3]	F [3]	F [3]	F [3]
No sidewalk	N/A			C [4]	F [3]	F [3]	F [3]

Pedestrian Level of Service: Intersections

The level of service for pedestrians is determined through a points system. The total number of points from tables 5.1 to 5.4 determine the level of service of the intersection for the pedestrians.

5.1 Crossing Distance & Conditions		
Total travel lanes crossed	No median	With Median (>2.4m)
2	120	120
3	105	105
4	88	90
5	72	75
6	55	60
7	39	45
8	23	30
9	6	15
10	-10	0
Island Refuge	Points	
No	-4	
Yes	0	

5.2 Signal Phasing & Timing Features	
Left turn conflict	Points
Permissive	-7
Protected/permissive	-5
Protected	0
No left turn/prohibited	0
Right turn conflict ("Right_turns")	Points
Permissive or yield control	-5
Protected/permissive	-5
Protected	0
No right turn	0
Right turns on red ("RTOR")	Points
RTOR allowed	-3
RTOR prohibited at certain time(s)	-2
RTOR prohibited	0
Leading ped interval? ("LPI")	Points
No	-2
Yes	0

5.3 Corner Radius	
Corner radius	**Points**
Greater than 25m	-9
> 15m to 25m	-8
> 10m to 15m	-6
> 5m to 10m	-5
> 3m to 5m	-4
Less than/equal to 3m	-3
No right turn	0
Right turn channel with receiving	-3
Right turn "smart channel"	2

5.4 Crosswalk Treatment	
Crosswalk treatment	**Points**
Standard transverse markings	-7
Textured/coloured pavement	-2
Zebra stripe hi-vis markings	-4
Raised crosswalk	0
No marking	-10

Pedestrian Exposure to Traffic LOS	
Points threshold	**LOS**
≥90	A
≥75	B
≥60	C
≥45	D
≥30	E
<30	F

Bicycle Level of Service: Segments

Type of Bikeway		LOS
Physically Separated Bikeway (cycle tracks, protected bike lanes and multi-use paths). Physical separation refers to, but is not limited to, curbs, raised medians, bollards and parking lanes (adjacent to the bike lane along the travelled way i.e. not curbside).		A
Bike Lanes Not Adjacent Parking Lane - Select Worst Scoring Criteria		
No. of Travel Lanes	1 travel lane in each direction	A
	2 travel lanes in each direction separated by a raised median	B
	2 travel lanes in each direction without a separating median	C
	More than 2 travel lanes in each direction	F
Bike Lane Width	> 1.8 m wide bike lane (includes marked buffer and paved gutter width)	A
	≥1.5 m to <1.8 m wide bike lane (includes marked buffer and paved gutter width)	B
	≥1.2 m to <1.5 m wide bike lane (includes marked buffer and paved gutter width)	C
Operating Speed	≤ 50 km/h operating speed	A
	60 km/h operating speed	C
	> 70 km/h operating speed	E
Bike lane blockage (commercial areas)	Rare	A
	Frequent	C
Bike Lanes Adjacent to curbside Parking Lane - Select Worst Scoring Criteria		
No. of Travel Lanes	1 travel lane in each direction	A
	2 or more travel lanes in each direction	C
Bike Lane Width	4.5 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	A
	4.25 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	B
	≤ 4.0 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	C
Operating Speed	< 40 km/h operating speed	A
	50 km/h operating speed	B
	60 km/h operating speed	D
	> 70 km/h operating speed	F
Bike lane blockage (commercial areas)	Rare	A
	Frequent	C
Mixed Traffic		
No. of Travel Lanes and Operating	2 travel lanes; ≤ 40 km/h; no marked centerline or classified as residential	A
	2 to 3 travel lanes; ≤ 40 km/h	B
	2 travel lanes; 50 km/h; no marked centerline or classified as residential	B
	2 to 3 travel lanes; 50 km/h	D
	4 to 5 travel lanes; ≤ 40 km/h	D
	4 to 5 travel lanes; ≥ 50 km/h	E
	6 or more travel lanes; ≤ 40 km/h	E
	≥ 60 km/h	F

Type of Bikeway		LOS
Unsignalized Crossing along Route: no median refuge		
No. of Travel Lanes on Side Street	3 or less lanes being crossed; ≤ 40 km/h	A
	4 to 5 lanes being crossed; ≤ 40 km/h	B
	3 or less lanes being crossed; 50 km/h	B
	4 to 5 lanes being crossed; 50 km/h	C
	3 or less lanes being crossed; 60 km/h	C
	4 to 5 lanes being crossed; 60 km/h	D
	6 or more lanes being crossed; ≤ 40 km/h	E
	3 or less lanes being crossed; ≥ 65 km/h	E
	6 or more lanes being crossed; ≥ 50 km/h	F
	4 to 5 lanes being crossed; ≥ 65 km/h	F
Unsignalized Crossing along Route: with median refuge (> 1.8 m wide)		
No. of Travel Lanes on Side Street	5 or less lanes being crossed; ≤ 40 km/h	A
	3 or less lanes being crossed; 50 km/h	A
	6 or more lanes being crossed; ≤ 40 km/h	B
	4 to 5 lanes being crossed; 50 km/h	B
	3 or less lanes being crossed; 60 km/h	B
	6 or more lanes being crossed; 50 km/h	C
	4 to 5 lanes being crossed; 60 km/h	C
	3 or less lanes being crossed; ≥ 65 km/h	D
	6 or more lanes being crossed; 60 km/h	E
	4 to 5 lanes being crossed; ≥ 65 km/h	E
	6 or more lanes being crossed; ≥ 65 km/h	F

Bicycle Level of Service: Intersections

Bikeway and Intersection Type		
Bike Lanes or higher order facility on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	No impact on LTS (as long as cycling facility remains to the right of any turn lane - otherwise see pocket bike lanes below)	A
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	C
	1 lane crossed, 50 km/h	C
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	E
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
Pocket Bike Lanes on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	Right-turn lane introduced to the right of the bike lane and ≤ 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	B
	Right-turn lane introduced to the right of the bike lane and > 50 m long, turning speed ≤ 30 km/h (based on curb radii and angle of intersection)	D
	Bike lane shifts to the left of the right-turn lane, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane with any other configurations	F
	Dual right-turn lanes (shared or exclusive)	F
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	Two-stage, left-turn bike box; ≤ 50 km/h	A
	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	C
	1 lane crossed, 50 km/h	C
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	E
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F
Mixed Traffic on a Signalized Intersection Approach		
Right-turn Lane and Turning Speed of Motorists	Right-turn lane 25 to 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)	D
	Right-turn lane 25 to 50 m long, turning speed > 25 km/h (based on curb radii and angle of intersection)	E
	Right-turn lane longer than 50 m	F
	Dual right-turn lanes (shared or exclusive)	F
	Two-stage, left-turn bike box; ≤ 50 km/h	A

Bikeway and Intersection Type		
Cyclist Making a Left-turn and Operating Speed of Motorists (refer to figure)	No lane crossed, ≤ 50 km/h	B
	1 lane crossed, ≤ 40 km/h	B
	No lane crossed, ≥ 60 km/h	D
	1 lane crossed, 50 km/h	D
	2 or more lanes crossed, ≤ 40 km/h	D
	1 lane crossed, ≥ 60 km/h	F
	2 or more lanes crossed, ≥ 50 km/h	F
	All other single left-turn lane configurations	F
	Dual left-turn lanes (shared or exclusive)	F

BLOS INTERSECTIONS

Score	Letter Grade
5	A
4	B
3	C
2	D
1	E
0	F

NOTE

If curb radius is larger than 14 m, then turning speed > 25km/hr

BLOS

Intersection		*Ninth Line at Derry Rd*			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	MUP on north, mixed on south
BLOS	Right turn lane length			None	
	Turning Speed (based on curb radii)			>25km/h	
	Dual right-turn lanes?			No	
	Right Turn LOS	A	A	E	A/F*
	Operating Speed (Posted Speed Limit)			60 km/h	60 km/h
	Number of Lanes Crossed			2 or more	2 or more
	Two-stage, left-turn bike box?	Yes	Yes	No	No
	Dual left-turn lanes (share or exclusive)?			No	No
	Left Turn LOS	A	A	F	A/F*
	Overall Approach LOS (average)	A	A	F	C
	LEVEL OF SERVICE	C			

* this is an important adjustment to account for the bi-directional MUPs on the east side of Ninth Line and on the north side of Derry Rd. If a cyclist is driving southbound on the east side, the Left LOS is A but if they are driving on the west side their LLOS is F (etc...)

Intersection		Ninth Line at Beacham Street			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated		mixed traffic
BLOS	Right turn lane length				None
	Turning Speed (based on curb radii)				>25km/h
	Dual right-turn lanes?				No
	Right Turn LOS	A	A		E
	Operating Speed (Posted Speed Limit)				50 km/h
	Number of Lanes Crossed				None
	Two-stage, left-turn bike box?	Yes	Yes		No
	Dual left-turn lanes (share or exclusive)?				No
	Left Turn LOS	A	A		B
	Overall Approach LOS (average)	A	A		D
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Street B North			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	
BLOS	Right turn lane length			None	
	Turning Speed (based on curb radii)			>25km/h	
	Dual right-turn lanes?			No	
	Right Turn LOS		A	E	
	Operating Speed (Posted Speed Limit)			50 km/h	
	Number of Lanes Crossed			None	
	Two-stage, left-turn bike box?	Yes		No	
	Dual left-turn lanes (share or exclusive)?			No	
	Left Turn LOS	A		B	
	Overall Approach LOS (average)	A	A	D	
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Doug Leavens Blvd / Street F			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	mixed traffic
BLOS	Right turn lane length			None	None
	Turning Speed (based on curb radii)			>25km/h	>25km/h
	Dual right-turn lanes?			No	No
	Right Turn LOS	A	A	E	E
	Operating Speed (Posted Speed Limit)			50 km/h	50 km/h
	Number of Lanes Crossed			None	1 lane
	Two-stage, left-turn bike box?	Yes	Yes	No	No
	Dual left-turn lanes (share or exclusive)?			No	No
	Left Turn LOS	A	A	B	D
	Overall Approach LOS (average)	A	A	D	E
	LEVEL OF SERVICE	C			

Intersection		Ninth Line at Street C			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	
BLOS	Right turn lane length			None	
	Turning Speed (based on curb radii)			>25km/h	
	Dual right-turn lanes?			No	
	Right Turn LOS		A	E	
	Operating Speed (Posted Speed Limit)			50 km/h	
	Number of Lanes Crossed			None	
	Two-stage, left-turn bike box?	Yes		No	
	Dual left-turn lanes (share or exclusive)?			No	
	Left Turn LOS	A		B	
	Overall Approach LOS (average)	A	A	D	
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Foxwood Ave / Street B South			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	mixed traffic
BLOS	Right turn lane length			None	None
	Turning Speed (based on curb radii)			>25km/h	>25km/h
	Dual right-turn lanes?			No	No
	Right Turn LOS	A	A	E	E
	Operating Speed (Posted Speed Limit)			50 km/h	50 km/h
	Number of Lanes Crossed			None	None
	Two-stage, left-turn bike box?	Yes	Yes	No	No
	Dual left-turn lanes (share or exclusive)?			No	No
	Left Turn LOS	A	A	B	B
	Overall Approach LOS (average)	A	A	D	D
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Osprey Blvd / Street A			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	mixed traffic
BLOS	Right turn lane length			None	None
	Turning Speed (based on curb radii)			>25km/h	>25km/h
	Dual right-turn lanes?			No	No
	Right Turn LOS	A	A	E	E
	Operating Speed (Posted Speed Limit)			50 km/h	50 km/h
	Number of Lanes Crossed			1 lane	1 lane
	Two-stage, left-turn bike box?	Yes	Yes	No	No
	Dual left-turn lanes (share or exclusive)?			No	No
	Left Turn LOS	A	A	D	D
	Overall Approach LOS (average)	A	A	E	E
	LEVEL OF SERVICE	C			

Intersection		Ninth Line at Britannia Rd			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	MUP on north, mixed on south
BLOS	Right turn lane length			None	
	Turning Speed (based on curb radii)			>25km/h	
	Dual right-turn lanes?			No	
	Right Turn LOS	A	A	E	A/F*
	Operating Speed (Posted Speed Limit)			70 km/h	70 km/h
	Number of Lanes Crossed			2 or more	2 or more
	Two-stage, left-turn bike box?	Yes	Yes	No	No
	Dual left-turn lanes (share or exclusive)?			No	No
	Left Turn LOS	A	A	F	A/F*
	Overall Approach LOS (average)	A	A	F	C
	LEVEL OF SERVICE	C			

* this is an important adjustment to account for the bi-directional MUPs on the east side of Ninth Line and on the north side of Derry Rd. If a cyclist is driving southbound on the east side, the Left LOS is A but if they are driving on the west side their LLOS is F (etc...)

Intersection		Ninth Line at McDowell Dr			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated		mixed traffic
BLOS	Right turn lane length				None
	Turning Speed (based on curb radii)				>25km/h
	Dual right-turn lanes?				No
	Right Turn LOS		A		E
	Operating Speed (Posted Speed Limit)				50 km/h
	Number of Lanes Crossed				None
	Two-stage, left-turn bike box?	Yes			No
	Dual left-turn lanes (share or exclusive)?				No
	Left Turn LOS	A			B
	Overall Approach LOS (average)	A	A		D
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Thomas St			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated		mixed traffic
BLOS	Right turn lane length				None
	Turning Speed (based on curb radii)				>25km/h
	Dual right-turn lanes?				No
	Right Turn LOS	A			E
	Operating Speed (Posted Speed Limit)				50 km/h
	Number of Lanes Crossed				1 lane
	Two-stage, left-turn bike box?		Yes		No
	Dual left-turn lanes (share or exclusive)?				No
	Left Turn LOS		A		D
	Overall Approach LOS (average)	A	A		E
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Tacc Dr			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated		mixed traffic
BLOS	Right turn lane length				None
	Turning Speed (based on curb radii)				>25km/h
	Dual right-turn lanes?				No
	Right Turn LOS	A			E
	Operating Speed (Posted Speed Limit)				50 km/h
	Number of Lanes Crossed				None
	Two-stage, left-turn bike box?		Yes		No
	Dual left-turn lanes (share or exclusive)?				No
	Left Turn LOS		A		B
	Overall Approach LOS (average)	A	A		D
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Erin Centre Blvd			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated		Dedicated
BLOS	Right turn lane length				None
	Turning Speed (based on curb radii)				>25km/h
	Dual right-turn lanes?				No
	Right Turn LOS	A			E
	Operating Speed (Posted Speed Limit)				50 km/h
	Number of Lanes Crossed				1 lane
	Two-stage, left-turn bike box?		Yes		No
	Dual left-turn lanes (share or exclusive)?				No
	Left Turn LOS		A		C
	Overall Approach LOS (average)	A	A		D
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Site Access			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	
BLOS	Right turn lane length			None	
	Turning Speed (based on curb radii)			>25km/h	
	Dual right-turn lanes?			No	
	Right Turn LOS		A	E	
	Operating Speed (Posted Speed Limit)			50 km/h	
	Number of Lanes Crossed			None	
	Two-stage, left-turn bike box?	Yes		No	
	Dual left-turn lanes (share or exclusive)?			No	
	Left Turn LOS	A		B	
	Overall Approach LOS (average)	A	A	D	
	LEVEL OF SERVICE	B			

Intersection		Ninth Line at Skyview St			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	mixed traffic
BLOS	Right turn lane length			None	None
	Turning Speed (based on curb radii)			>25km/h	>25km/h
	Dual right-turn lanes?			No	No
	Right Turn LOS	A	A	E	E
	Operating Speed (Posted Speed Limit)			50 km/h	50 km/h
	Number of Lanes Crossed			None	None
	Two-stage, left-turn bike box?	Yes	No	No	No
	Dual left-turn lanes (share or exclusive)?			No	No
	Left Turn LOS	A	A	B	B
	Overall Approach LOS (average)	A	A	D	D
	LEVEL OF SERVICE	C			

Intersection		Ninth Line at Eglinton Ave			
		NORTH	SOUTH	WEST	EAST
	Cycling Facility	Dedicated	Dedicated	mixed traffic	mixed traffic
BLOS	Right turn lane length			None	>50m
	Turning Speed (based on curb radii)			>25km/h	>25km/h
	Dual right-turn lanes?			No	No
	Right Turn LOS	A	A	E	F
	Operating Speed (Posted Speed Limit)			60 km/h	60 km/h
	Number of Lanes Crossed			2 or more	2 or more
	Two-stage, left-turn bike box?	Yes	Yes	No	No
	Dual left-turn lanes (share or exclusive)?			No	No
	Left Turn LOS	A	A	F	F
	Overall Approach LOS (average)	A	A	F	F
	LEVEL OF SERVICE	D			

Segment BLOS

Although MUPs are bi-directional, we assign a score for each side of the street to set higher standards for cycling in the City.

				Future Conditions											
				West						East					
		From	To	Bikeway Type*	No. Travel Lanes**	Bike Lane width (if applicable)	Operating Speed (kph)	Bike Lane Blockage (if applicable)	segment BLOS	Bikeway Type*	No. Travel Lanes**	Bike Lane width (if applicable)	Operating Speed (kph)	Bike Lane Blockage (if applicable)	segment BLOS
Ninth Line	Segment 1	Eglinton Avenue	133m North of Eglinton Avenue	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 2	133m North of Eglinton Avenue	Stardust Drive	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 3	Stardust Drive	Skyview Street	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 4	Skyview Street	Quiet Creek Drive (North Portion)	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 5	Quiet Creek Drive (North Portion)	Erin Centre Boulevard	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 6	Erin Centre Boulevard	Mayla Drive	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 7	Mayla Drive	Henrietta Way	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 8	Henrietta Way	Janice Drive	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 9	Janice Drive	130m North of Janice Drive	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 10	130m North of Janice Drive	35m South of Tacc Drive	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 11	35m South of Tacc Drive	Tacc Drive	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 12	Tacc Drive	Deepwood Heights	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 13	Deepwood Heights	Thomas Street	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 14	Thomas Street	Brittania Road	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 15	Brittania Road	Parkgate Drive	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 16	Parkgate Drive	North end of Osprey Marsh (240m N of Parkgate Drive)	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 17	North end of Osprey Marsh (240m N of Parkgate Drive)	Osprey Boulevard	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 18	Osprey Boulevard	Doug Leavens Boulevard	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 19	Doug Leavens Boulevard	Lisgar Neighbourhood Square Access	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A
	Segment 20	Lisgar Neighbourhood Square Access	Derry Avenue	Dedicated	2	2	60	n/a	A	Dedicated	2	2	60	n/a	A

Intersection PLOS - Results

NOTES

1. For unsignalized intersections, stop and yield controlled approaches affect the pedestrian experience the same way a "permissive" signalized movement does, such as when a right-turn-on-red is allowed and a green is permissive. Because the turn is allowed based on driver judgment, pedestrians will feel less safe where a car is waiting to make the turn in their vicinity.
2. Intersections PLOS scores were adjusted on an individual basis to better capture the conditions within the specific context.
3. The average of all intersection approaches was used to determine an overall score for the intersection to better capture nuances and differences in LOS (especially between major-major and major-minor intersections)

Signalized

Intersection		*Ninth Line at Derry Road*							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	6	60	6	60	6	60	6	60
	Median	Yes		Yes		Yes		Yes	
	Island Refuge	No	-4	No	-4	No	-4	No	-4
	Conflicting Left Turn	Protected/permissive	-5	Protected/permissive	-5	Protected/permissive	-5	Protected/permissive	-5
	Conflicting Right Turn	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5
	RTOR	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3
	Ped Leading Interval	Yes	0	Yes	0	Yes	0	Yes	0
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	E (31)	31	E (31)	31	E (31)	31	E (31)	31
		E							
Adjusted LOS based on average approach		**E**							

penalize from D average to E due to corner curbs not available on 3/4 approaches

Signalized

Intersection		*Ninth Line at Beacham Street*							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75			2	120
	Median	Yes		Yes				No	
	Island Refuge	No	-4	No	-4			No	-4
	Conflicting Left Turn	No left turn/prohibited	0	Permissive	-7			Permissive	-7
	Conflicting Right Turn	Permissive or yield control	-5	No right turn	0			Permissive or yield control	-5
	RTOR	RTOR prohibited	0	RTOR allowed	-3			RTOR allowed	-3
	Ped Leading Interval	No	-2	No	-2			No	-2
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8			> 15m to 25m	-8
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4			Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	D (52)	52	D (47)	47			B (87)	87
		D							
	Adjusted LOS based on average approach	**C**							

South only has 4 lanes but approximately matches the 5 lane + median on the north side due to the wide 5m median

Unsignalized

Intersection		*Ninth Line at Street B North*							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75	2	120		
	Median	Yes		Yes		No			
	Island Refuge	No	-4	No	-4	No	-4		
	Conflicting Left Turn	Permissive	-7	No left turn/prohibited	0	Permissive	-7		
	Conflicting Right Turn	No right turn	0	Permissive or yield control	-5	Permissive or yield control	-5		
	RTOR	RTOR allowed	-3	RTOR prohibited	0	RTOR allowed	-3		
	Ped Leading Interval	No	-2	No	-2	Yes	0		
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8		
	Crosswalk Type	No marking	-10	No marking	-10	Standard transverse markings	-7		
	LEVEL OF SERVICE (worst case)	E (41)	41	D (46)	46	B (86)	86		
		E							
	Adjusted LOS based on average approach	**D**							

Signalized

Intersection		*Ninth Line at Doug Leavens Boulevard*							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75	2	120	3	105
	Median	Yes		Yes		No		No	
	Island Refuge	No	-4	No	-4	No	-4	No	-4
	Conflicting Left Turn	Protected/permissive	-5	Permissive	-7	Permissive	-7	Permissive	-7
	Conflicting Right Turn	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5
	RTOR	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3
	Ped Leading Interval	Yes	0	Yes	0	Yes	0	Yes	0
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	D (46)	46	E (44)	44	B (89)	89	C (74)	74
		E							
	Adjusted LOS based on average approach	**C**							

Unsignalized

Intersection		Ninth Line at Street C							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75	2	120		
	Median	Yes		Yes		No			
	Island Refuge	No	-4	No	-4	No	-4		
	Conflicting Left Turn	Permissive	-7	No left turn/prohibited	0	Permissive	-7		
	Conflicting Right Turn	No right turn	0	Permissive or yield control	-5	Permissive or yield control	-5		
	RTOR	RTOR allowed	-3	RTOR prohibited	0	RTOR allowed	-3		
	Ped Leading Interval	No	-2	No	-2	No	-2		
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8		
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	No marking	-10		
	LEVEL OF SERVICE (worst case)	D (47)	47	D (52)	52	B (81)	81		
		D							
	Adjusted LOS based on average approach	**C**							

Unsignalized

Intersection		Ninth Line at Foxwood Avenue / Street B South							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75	2	120	2	120
	Median	Yes		Yes		No		No	
	Island Refuge	No	-4	No	-4	No	-4	No	-4
	Conflicting Left Turn	Permissive	-7	Permissive	-7	Permissive	-7	Permissive	-7
	Conflicting Right Turn	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5
	RTOR	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3
	Ped Leading Interval	No	-2	No	-2	No	-2	No	-2
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	No marking	-10	No marking	-10
	LEVEL OF SERVICE (worst case)	E (42)	42	E (42)	42	B (81)	81	B (81)	81
		E							
	Adjusted LOS based on average approach	**C**							

Signalized

Intersection		Ninth Line at Osprey Boulevard / Street A							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75	2	120	3	105
	Median	Yes		Yes		No		No	
	Island Refuge	No	-4	No	-4	No	-4	No	-4
	Conflicting Left Turn	Permissive	-7	Permissive	-7	Permissive	-7	Permissive	-7
	Conflicting Right Turn	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5
	RTOR	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3
	Ped Leading Interval	Yes	0	Yes	0	Yes	0	Yes	0
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	E (44)	44	E (44)	44	B (89)	89	C (74)	74
		E							
	Adjusted LOS based on average approach	**C**							

Signalized

Intersection		Ninth Line at Britannia Road							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	6	60	5	75	7	45	6	60
	Median	Yes		Yes		Yes		Yes	
	Island Refuge	No	-4	No	-4	No	-4	No	-4
	Conflicting Left Turn	Protected/permissive	-5	Protected/permissive	-5	Protected/permissive	-5	Protected/permissive	-5
	Conflicting Right Turn	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5
	RTOR	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3
	Ped Leading Interval	Yes	0	Yes	0	Yes	0	Yes	0
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	E (31)	31	D (46)	46	F (16)	16	E (31)	31
		F							
	Adjusted LOS based on average approach	**E**							

Signalized

Intersection		Ninth Line and McDowell Drive							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75			2	120
	Median	Yes		Yes				No	
	Island Refuge	No	-4	No	-4			No	-4
	Conflicting Left Turn	No left turn/prohibited	0	Permissive	-7			Permissive	-7
	Conflicting Right Turn	Permissive or yield control	-5	No right turn	0			Permissive or yield control	-5
	RTOR	RTOR prohibited	0	RTOR allowed	-3			RTOR allowed	-3
	Ped Leading Interval	No	-2	No	-2			No	-2
	Corner Radius (largest)	> 10m to 15m	-6	> 10m to 15m	-6			> 10m to 15m	-6
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4			Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	D (54)	54	D (49)	49			B (89)	89
		D							
Adjusted LOS based on average		**C**							

Signalized

Intersection		Ninth Line and Thomas Street							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75			4	90
	Median	Yes		Yes				Yes	
	Island Refuge	No	-4	No	-4			No	-4
	Conflicting Left Turn	No left turn/prohibited	0	Permissive	-7			Protected/permissive	-5
	Conflicting Right Turn	Permissive or yield control	-5	No right turn	0			Permissive or yield control	-5
	RTOR	RTOR prohibited	0	RTOR allowed	-3			RTOR allowed	-3
	Ped Leading Interval	No	-2	No	-2			No	-2
	Corner Radius (largest)	> 10m to 15m	-6	> 10m to 15m	-6			> 10m to 15m	-6
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4			Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	D (54)	54	D (49)	49			C (61)	61
		D							
Adjusted LOS based on average approach		D							

Signalized

Intersection		Ninth Line and Tacc Drive							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75			2	120
	Median	Yes		Yes				No	
	Island Refuge	No	-4	No	-4			No	-4
	Conflicting Left Turn	No left turn/prohibited	0	Permissive	-7			Permissive	-7
	Conflicting Right Turn	Permissive or yield control	-5	No right turn	0			Permissive or yield control	-5
	RTOR	RTOR prohibited	0	RTOR allowed	-3			RTOR allowed	-3
	Ped Leading Interval	No	-2	No	-2			No	-2
	Corner Radius (largest)	> 10m to 15m	-6	> 10m to 15m	-6			> 10m to 15m	-6
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4			No marking	-10
	LEVEL OF SERVICE (worst case)	D (54)	54	D (49)	49			B (83)	83
		D							
Adjusted LOS based on average approach		C							

Signalized

Intersection		Ninth Line and Erin Centre Boulevard							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75			3	105
	Median	Yes		Yes				No	
	Island Refuge	No	-4	No	-4			No	-4
	Conflicting Left Turn	No left turn/prohibited	0	Permissive	-7			Protected/permissive	-5
	Conflicting Right Turn	Permissive or yield control	-5	No right turn	0			Permissive or yield control	-5
	RTOR	RTOR prohibited	0	RTOR allowed	-3			RTOR allowed	-3
	Ped Leading Interval	Yes	0	No	-2			Yes	0
	Corner Radius (largest)	> 10m to 15m	-6	> 15m to 25m	-8			> 15m to 25m	-8
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4			Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	D (56)	56	D (47)	47			B (76)	76
		D							
Adjusted LOS based on average approach		D							

Unsignalized

Intersection		Ninth Line and Site Access							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	5	75	2	120		
	Median	Yes		Yes		Yes			
	Island Refuge	No	-4	No	-4	No	-4		
	Conflicting Left Turn	Permissive	-7	No left turn/prohibited	0	Permissive	-7		
								EAST	
		Selection	Point	Selection	Point	Selection	Point		
	Lanes	5		5		5			
	Median	Yes		Yes		Yes			
	Island Refuge	No	-4	No	-4	No	-4		
	Conflicting Left Turn	No left turn/prohibited	0	Permissive	-7	Protected/permissive	-5	Protected/permissive	-5
	Conflicting Right Turn	Permissive or yield control	-5	No right turn	0	Permissive or yield control	-5	Permissive or yield control	-5
	RTOR	RTOR prohibited	0	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3
	Ped Leading Interval	No	-2	No	-2	Yes	0	No	-2
	Corner Radius (largest)	> 10m to 15m	-6	> 10m to 15m	-6	> 15m to 25m	-8	> 10m to 15m	-6
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	No marking	-10	Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	D (54)	54	D (49)	49			C (61)	61
Adjusted LOS based on average approach									

Signalized

Intersection		Ninth Line and Skyview St							
			75		75		105		105
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5		5				2	
	Median	Yes		Yes				No	
	Island Refuge	No	-4	No	-4			No	-4
	Conflicting Left Turn	No left turn/prohibited	0	Permissive	-7			Permissive	-7
	Conflicting Right Turn	Permissive or yield control	-5	No right turn	0			Permissive or yield control	-5
	RTOR	RTOR prohibited	0	RTOR allowed	-3			RTOR allowed	-3
	Ped Leading Interval	No	-2	No	-2			No	-2
	Corner Radius (largest)	> 10m to 15m	-6	> 10m to 15m	-6			> 10m to 15m	-6
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4			No marking	-10
	LEVEL OF SERVICE (worst case)	D (54)	54	D (49)	49			B (83)	83

Signalized

Intersection		Ninth Line and Eglinton Avenue							
		NORTH		SOUTH		WEST		EAST	
		Selection	Point	Selection	Point	Selection	Point	Selection	Point
Pedestrian	Lanes	5	75	6	60	4	90	5	75
	Median	Yes		Yes		Yes		Yes	
	Island Refuge	No	-4	No	-4	No	-4	No	-4
	Conflicting Left Turn	Permissive	-7	Protected/permissive	-5	Protected/permissive	-5	Protected/permissive	-5
	Conflicting Right Turn	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5	Permissive or yield control	-5
	RTOR	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3	RTOR allowed	-3
	Ped Leading Interval	No	-2	No	-2	No	-2	No	-2
	Corner Radius (largest)	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8
	Crosswalk Type	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4	Zebra stripe hi-vis markings	-4
	LEVEL OF SERVICE (worst case)	E (42)	42	F (29)	29	D (59)	59	E (44)	44
		F							
Adjusted LOS based on average approach		**E**							

				Future Conditions											
				West						East					
		From	To	Sidewalk / MUP Width (m)	Boulevard Width (m)	AADT	Presence of on-street parking or other equivalent barrier **	Operating Speed (km/h)	Segment PLOS	Sidewalk / MUP Width (m)	Boulevard Width (m)	AADT	Presence of on-street parking or other equivalent barrier **	Operating Speed (km/h)	Segment PLOS
Ninth Line	Segment 1	Eglinton Avenue	133m North of Eglinton Avenue	2	5.45	>3000	Yes	60	B	2	11.04	>3000	Yes	60	B
	Segment 2	133m North of Eglinton Avenue	Stardust Drive	2	5.45	>3000	Yes	60	B	2	11.04	>3000	Yes	60	B
	Segment 3	Stardust Drive	Skyview Street	2	5.45	>3000	Yes	60	B	2	10.02	>3000	Yes	60	B
	Segment 4	Skyview Street	Quiet Creek Drive (North Portion)	2	5.45	>3000	Yes	60	B	2	5.45	>3000	Yes	60	B
	Segment 5	Quiet Creek Drive (North Portion)	Erin Centre Boulevard	2	5.45	>3000	Yes	60	B	2	3.5	>3000	No	60	C
	Segment 6	Erin Centre Boulevard	Mayla Drive	2	5.45	>3000	Yes	60	B	2	4.5	>3000	Yes	60	B
	Segment 7	Mayla Drive	Henrietta Way	2	5.45	>3000	Yes	60	B	2	4.5	>3000	Yes	60	B
	Segment 8	Henrietta Way	Janice Drive	2	5.45	>3000	Yes	60	B	2	4.5	>3000	Yes	60	B
	Segment 9	Janice Drive	130m North of Janice Drive	2	5.45	>3000	Yes	60	B	2	5.45	>3000	Yes	60	B
	Segment 10	130m North of Janice Drive	35m South of Tacc Drive	2	5.45	>3000	Yes	60	B	2	5.45	>3000	Yes	60	B
	Segment 11	35m South of Tacc Drive	Tacc Drive	2	5.45	>3000	Yes	60	B	2	5.45	>3000	Yes	60	B
	Segment 12	Tacc Drive	Deepwood Heights	2	3	>3000	No	60	C	2	5.45	>3000	Yes	60	B
	Segment 13	Deepwood Heights	Thomas Street	2	5.45	>3000	Yes	60	B	2	5.45	>3000	Yes	60	B
	Segment 14	Thomas Street	Brittania Road	2	5.45	>3000	Yes	60	B	2	5.45	>3000	Yes	60	B
	Segment 15	Brittania Road	Parkgate Drive	2	3.5	>3000	No	60	C	2	18.19	>3000	Yes	60	B
	Segment 16	Parkgate Drive	North end of Osprey Marsh (240m N of Parkgate Drive)	2	5.45	>3000	Yes	60	B	2	5.45	>3000	Yes	60	B
	Segment 17	North end of Osprey Marsh (240m N of Parkgate Drive)	Osprey Boulevard	2	3.5	>3000	No	60	C	2	5.45	>3000	Yes	60	B
	Segment 18	Osprey Boulevard	Doug Leavens Boulevard	2	5.45	>3000	Yes	60	B	2	3	>3000	No	60	C
	Segment 19	Doug Leavens Boulevard	Lisgar Neighbourhood Square Access	2	5.45	>3000	Yes	60	B	2	5.45	>3000	Yes	60	B
	Segment 20	Lisgar Neighbourhood Square Access	Derry Avenue	2	5.45	>3000	Yes	60	B	2	3	>3000	No	60	B