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12 August 2019  
Project: 190327

Penryn Mason Homes  
C/O Dykstra Planning and Development Group  
7030 Woodbine Avenue  
Suite 500  
Markham, ON L3R 6G2

Dear Sir:

**RE: TRANSPORTATION IMPACT STUDY ADDENDUM, MASON HOMES – PORT HOPE  
RESIDENTIAL DEVELOPMENT – PHASES 4, 5/9**

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The original Transportation Impact Study for the subject subdivision phases was completed in July 2017 (July 2017 TIS). The purpose of this Addendum is to address changes in land use since that time, and specifically, to analyze revised peak hour traffic forecasts for the Toronto Road-Victoria Street South/Ridout Street intersection. This additional work was requested by Municipality of Port Hope staff to determine if the land use changes could result in the need for intersection improvements at the Toronto Road-Victoria Street South/Ridout Street intersection. The original study had concluded that no improvements would be required.

### **Proposed Development**

**Figure 1** (attached) illustrates the location of the “Phases 4 and 5/9” lands, which are in the southwest quadrant of the Toronto Road-Victoria Street South/Ridout Street intersection in the Municipality of Port Hope, and partial development of lands north of Lakeshore Road. The development of the latter lands has been considered to represent a conservative scenario whereby these lands are developed and occupied within the same timeframe as the Phase 4 and 5/9 lands. Overall, the subject lands are part of a larger residential community that was initially proposed by AON Inc. and subsequently approved by the Ontario Municipal Board (OMB) in the early 2000’s.

Previously, 438 single detached homes were proposed for Phases 4 and 5. With changes in Phase 5 and the addition of the Phase 9 lands, the currently proposed land use is for 495 single detached homes, which represents an increase of 57 units of this type, and 43 townhouses, for a total of 538 residential units (total increase of 100 units).

For the lands north of Lakeshore Road, there are no proposed changes in the land use previously considered<sup>1</sup>. Access to the adjacent municipal road network via Strachan Street is also unchanged.

**Figure 2** (attached) presents the site plan and highlights the Phase 5/9 lands. **Figure 3** (attached) illustrates the land use blocks north of Lakeshore Road.

### Traffic Forecasts

Revised traffic forecasts for the same 2022 horizon year considered in the July 2017 TIS have been developed by combining the original background traffic forecasts (2% compound growth applied to 2016 base year traffic volumes) with new site traffic forecasts for the Phase 4 and 5/9 lands and the original forecasts for partial development of lands north of Lakeshore Road.

The original and revised trip generation for the Phase 4 and 5/9 lands is shown in **Table 1**. The same trip generation rates as in the July 2017 TIS were applied to the new total number of residential units. The revised AM and PM peak hour trip estimates were assigned to the road network, including the Toronto Road-Victoria Street South/Ridout Street intersection, using the same trip distribution and assignment assumptions as in the July 2017 TIS.

**TABLE 1: SITE TRIP GENERATION – PHASE 4 AND 5/9**

Land Use	Units	Vehicle Trips							
		AM Peak Hour				PM Peak Hour			
		Rate/Unit	Total	In	Out	Rate/Unit	Total	In	Out
New Phase 4 and 5/9	538	0.50	269	67	202	0.67	359	226	133
Original Phase 4 and 5	438	0.50	219	55	164	0.67	292	184	108
<i>Net Difference</i>	<i>+100</i>	<i>-</i>	<i>+50</i>	<i>+12</i>	<i>+38</i>	<i>-</i>	<i>+67</i>	<i>+42</i>	<i>+25</i>

As shown above, the additional residential units now proposed would increase the peak hour site traffic by 50 trips in the AM peak hour and 67 trips in the PM peak hour. On average, this represents approximately one additional trip per minute on the study area road network.

<sup>1</sup> 14 low density residential units (Block 6); 45 medium density residential units (Block 5); 165 high density residential units (Blocks 7, 8, 9, and 10); 180 units in an “institutional urban” zone with permitted uses such as a nursing home, long term care facility, and retirement home (Block 4); and a mixed retail-commercial-residential development with 1,000 square metres (10,760 square feet) gross floor area of commercial (maximum under the Zoning By-law, and including up to 260 square metres gross leasable area for a retail store), and eight second floor residential units on the second storey.



The forecasts for the original study area are shown in the following Figures (attached):

- ▶ **Figure 4** – 2022 Background Traffic, AM Peak Hour;
- ▶ **Figure 5** – 2022 Background Traffic, PM Peak Hour;
- ▶ **Figure 6** – 2022 Phase 4 and 5/9 Site Traffic, AM Peak Hour;
- ▶ **Figure 7** – 2022 Phase 4 and 5/9 Site Traffic, PM Peak Hour;
- ▶ **Figure 8** – 2022 North of Lakeshore Site Traffic, AM Peak Hour;
- ▶ **Figure 9** – 2022 North of Lakeshore Site Traffic, PM Peak Hour;
- ▶ **Figure 10** – 2022 Total Traffic, AM Peak Hour; and
- ▶ **Figure 11** – 2022 Total Traffic, PM Peak Hour.

## Analysis

The 2022 AM and PM peak hour total traffic forecasts for the Toronto Road-Victoria Street South/Ridout Street intersection were analyzed using Synchro software with the same lane arrangements, signal timings, and parameters as in the July 2017 TIS. **Table 2** provides a summary of the analysis results and a comparison of the measures of effectiveness. The detailed Synchro software output for the new analysis is attached for reference.

**TABLE 2: 2022 TOTAL TRAFFIC OPERATIONS**

Approach/Movement		AM Peak Hour				PM Peak Hour			
		LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup>	Q <sup>4</sup>	LOS <sup>1</sup>	Delay <sup>2</sup>	V/C <sup>3</sup>	Q <sup>4</sup>
<b>Original July 2017 Analysis Results</b>									
EB	Left/Through/Right	B	14	0.44	33	B	15	0.49	38
WB	Left/Through	B	11	0.12	11	B	12	0.26	22
	Right	B	11	0.14	8	B	11	0.18	12
NB	Left/Through/Right	B	12	0.29	24	B	12	0.33	29
SB	Left	B	17	0.55	36	B	16	0.50	36
	Through/Right	B	11	0.23	18	B	15	0.50	46
<b>Overall Intersection</b>		<b>B</b>	<b>13</b>	<b>0.50</b>	<b>-</b>	<b>B</b>	<b>14</b>	<b>0.50</b>	<b>-</b>
<b>Addendum August 2019 Results</b>									
EB	Left/Through/Right	B	14	0.45	34	B	16	0.51	39
WB	Left/Through	B	11	0.12	11	B	12	0.28	23
	Right	B	11	0.14	8	B	11	0.18	12
NB	Left/Through/Right	B	12	0.33	27	B	13	0.35	31
SB	Left	B	18	0.58	37	B	16	0.52	37
	Through/Right	B	12	0.25	19	B	15	0.54	50
<b>Overall Intersection</b>		<b>B</b>	<b>13</b>	<b>0.52</b>	<b>-</b>	<b>B</b>	<b>14</b>	<b>0.52</b>	<b>-</b>

<sup>1</sup> Level-of-Service; <sup>2</sup> Average vehicle delay, seconds; <sup>3</sup> Volume-to-Capacity ratio; <sup>4</sup> 95<sup>th</sup> percentile queue, metres



The analysis shows that there are insignificant differences between the original and updated analysis results with the higher number of residential units. Consistent with the July 2017 TIS, there would be no improvements required at the Toronto Road-Victoria Street South/Ridout Street intersection to accommodate the proposed level of development. Similarly, with the relatively small amount of additional traffic that would be distributed throughout the original study area road network, there would be no significant change in future traffic operations at any other intersection.

## Conclusions

The conclusion of the Addendum is as follows:

- ▶ The proposed increase in the number of residential units on the Phase 4 and 5/9 lands would not have a significant impact on traffic operations at the Toronto Road-Victoria Street South/Ridout Street intersection or at any other intersection in the original study area road network.

## Recommendations

The recommendation of the Addendum is as follows:

- ▶ The proposed development of Phases 4 and 5/9, within the larger residential community that was initially proposed by AON Inc., be approved from a transportation perspective.

If you have any questions or comments, please contact the undersigned.

Yours truly,

## PARADIGM TRANSPORTATION SOLUTIONS LIMITED



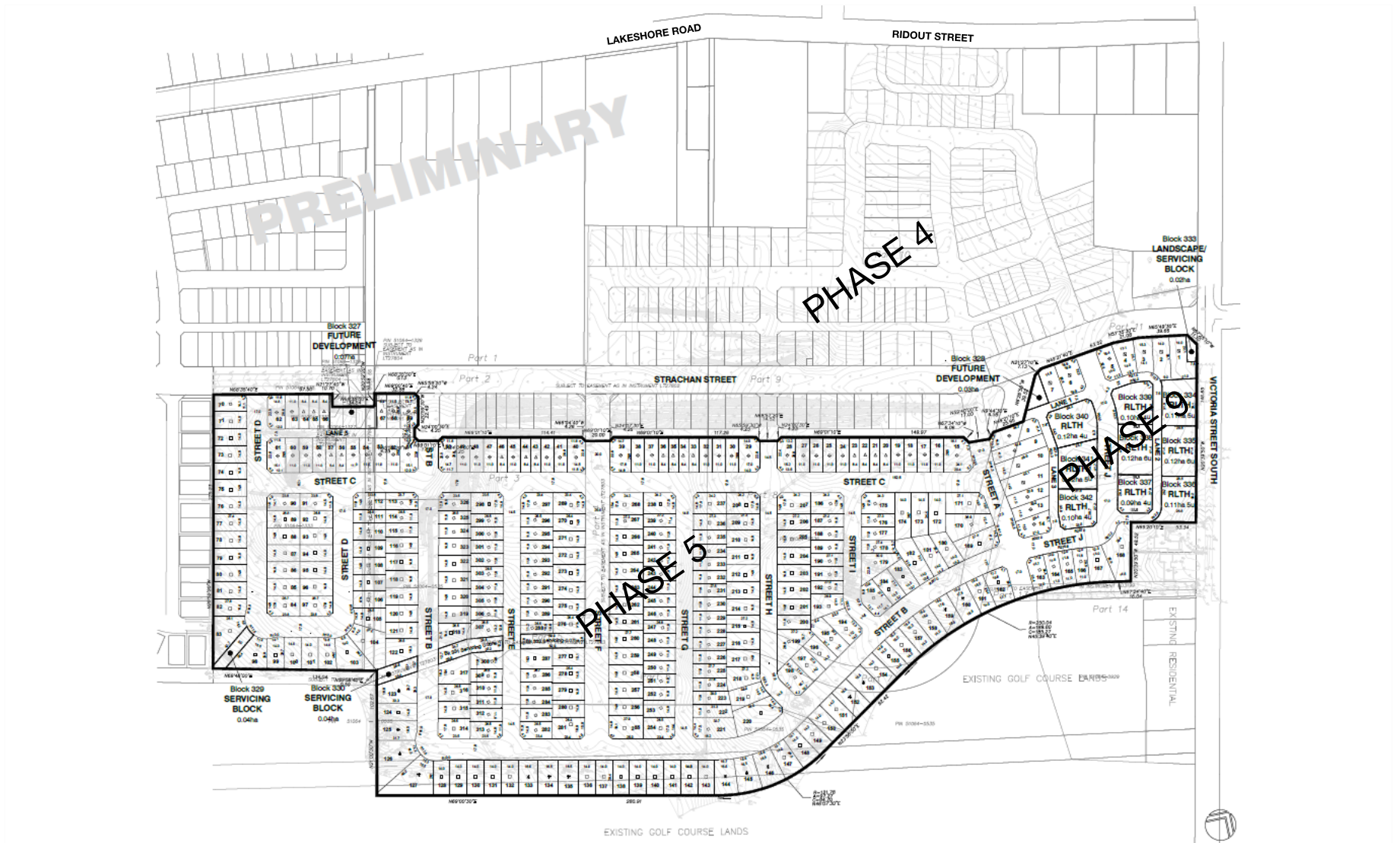
**Garry Pappin**  
BES, LEL  
Senior Project Manager

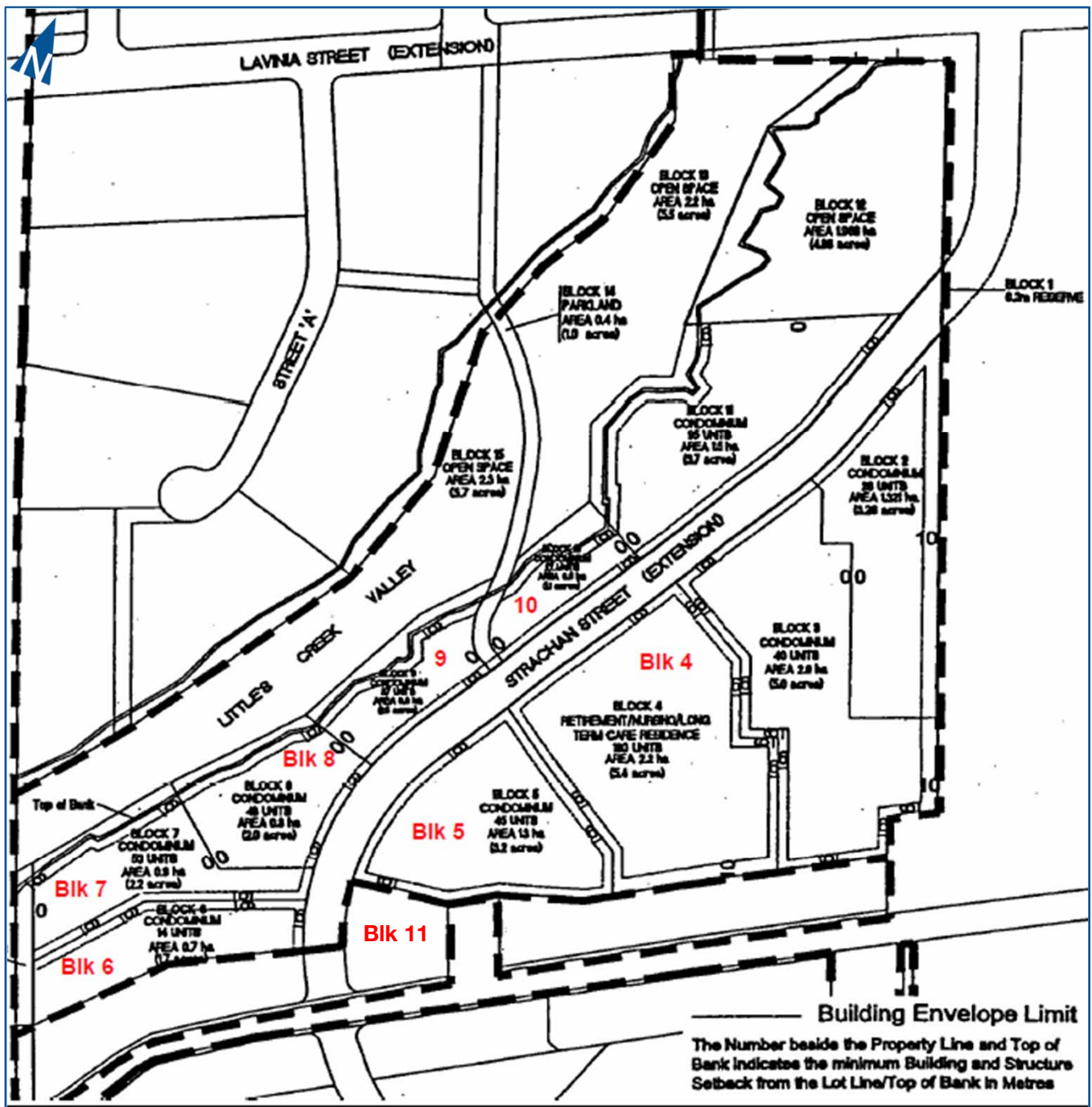
Attach.





## Location of Subject Lands Municipality of Port Hope





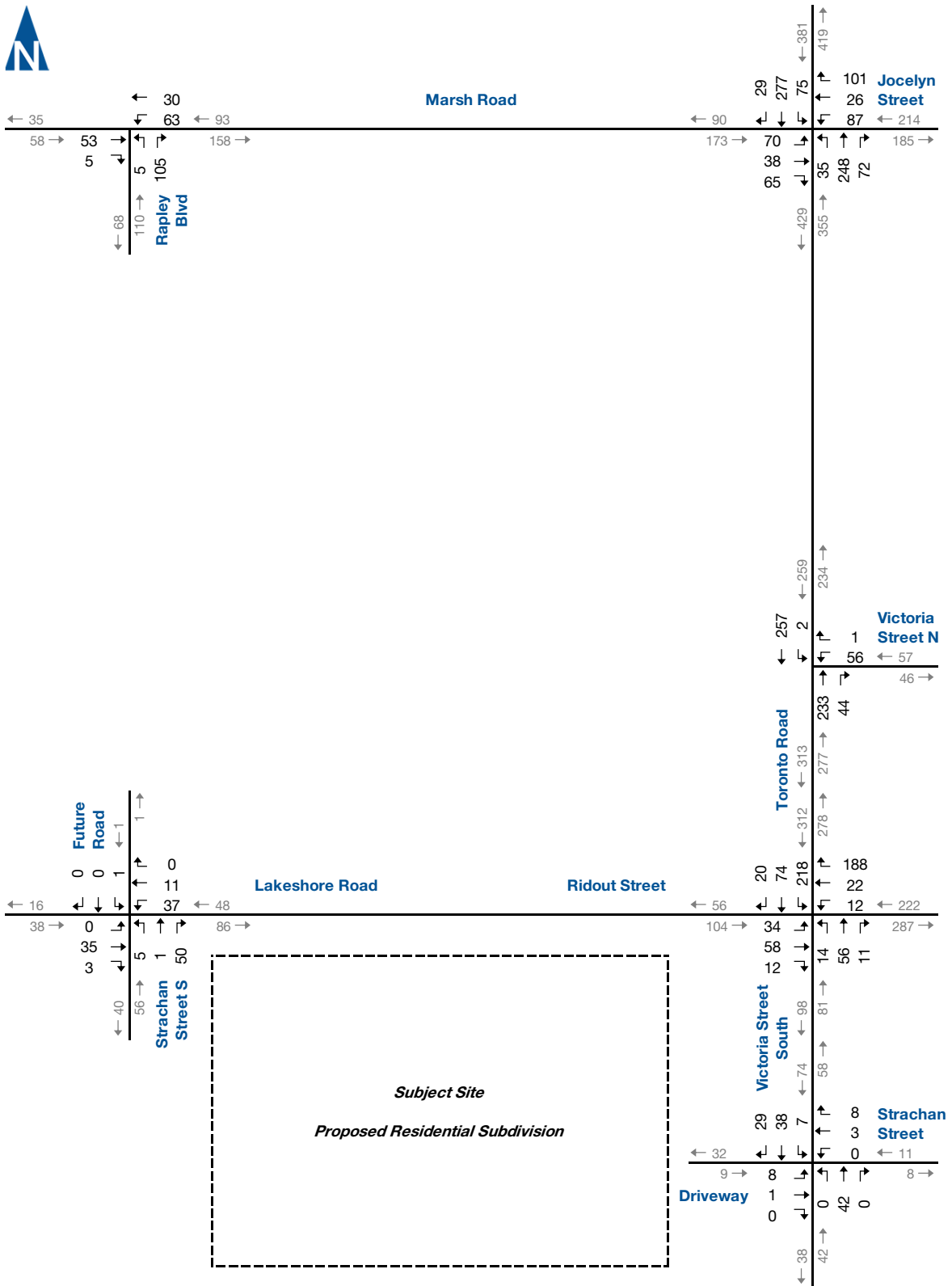
**SCHEDULE 'C-9'**  
**ZONING BY-LAW 20/2010**

ADOPTED: JUNE 29, 2010  
 LAST UPDATED: JUNE 29, 2010

JUNE 29, 2010

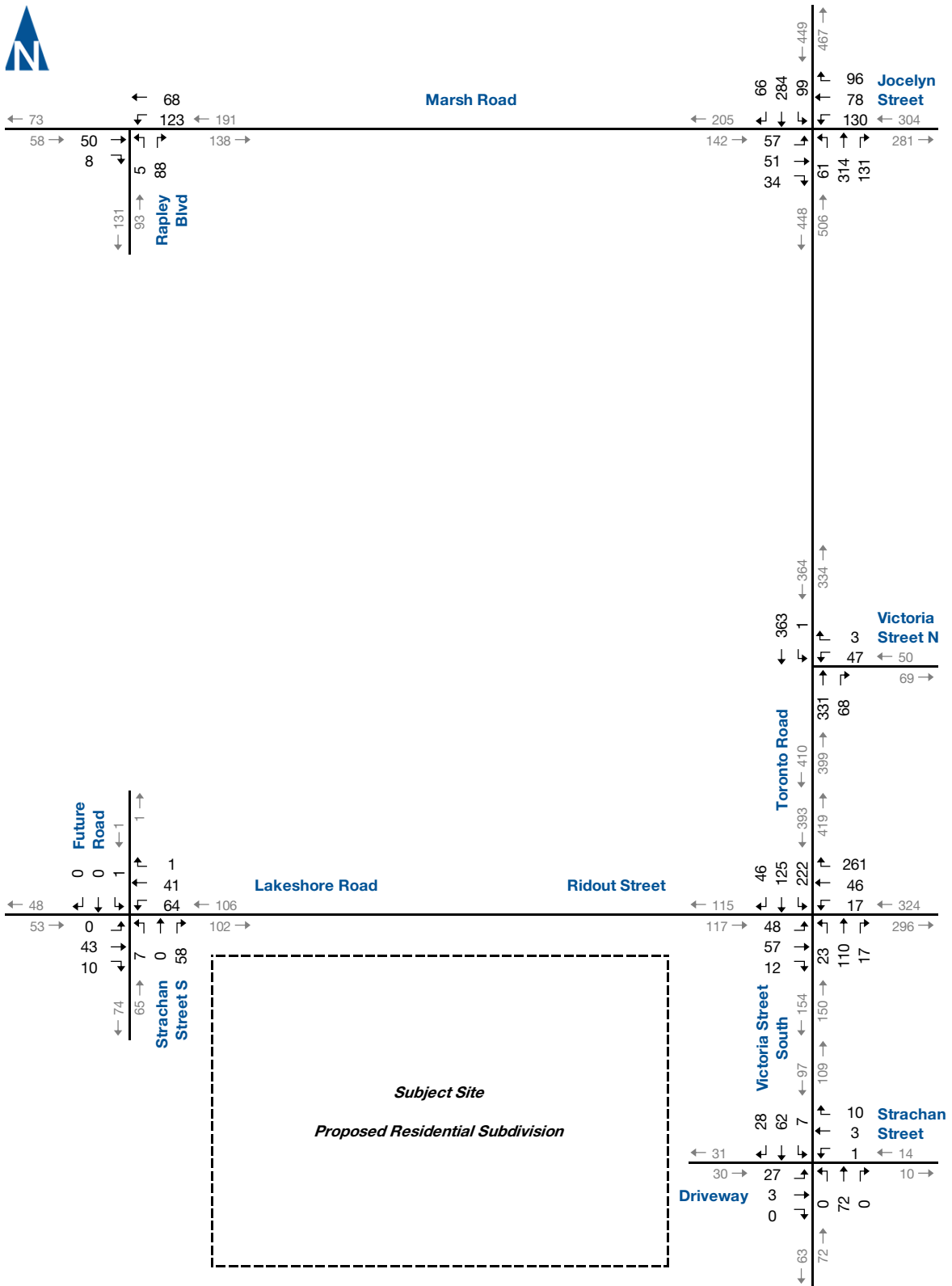


**Partial Development (Blocks 4 to 11)**  
**North of Lakeshore Road**

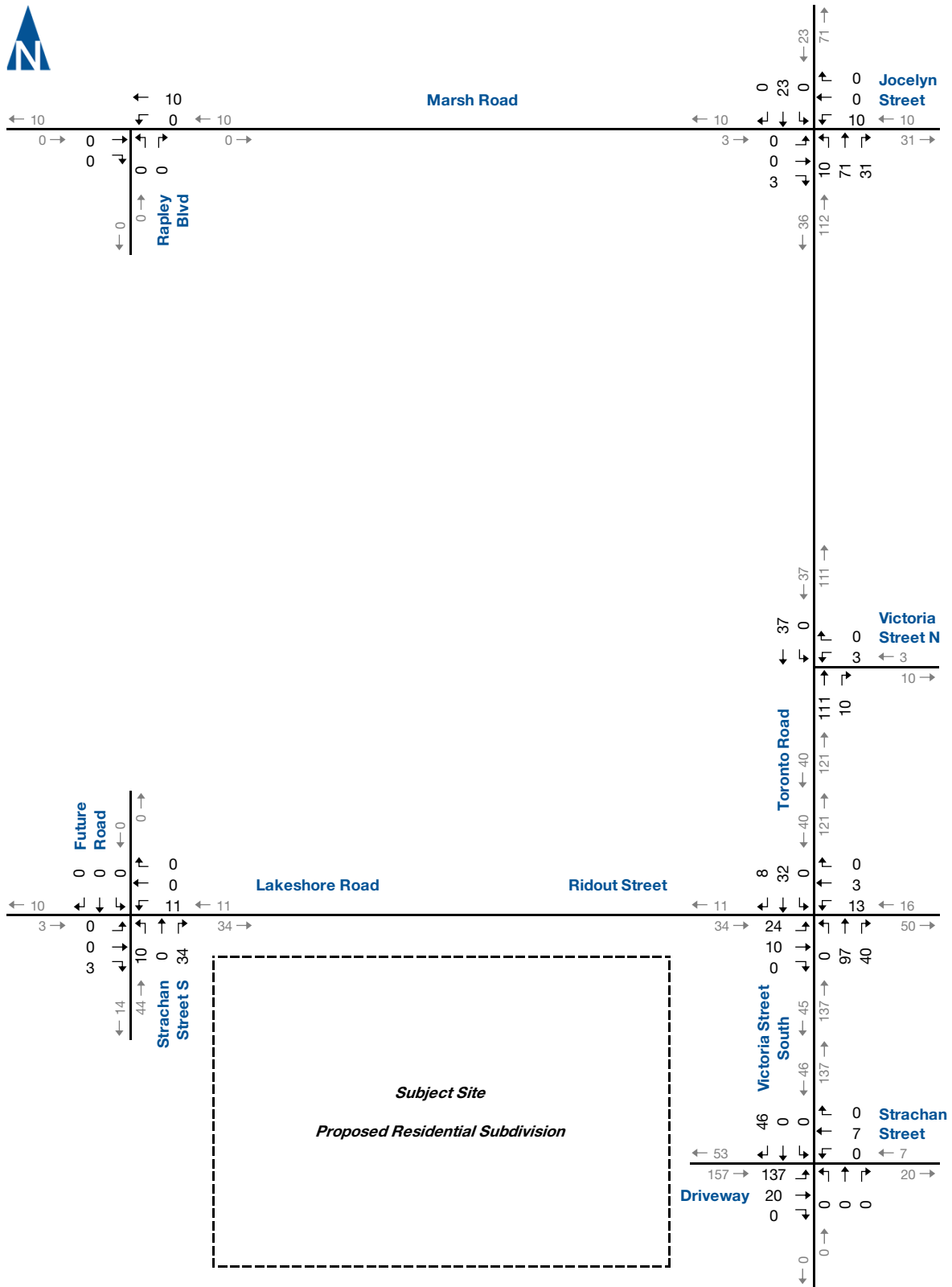


## 2022 Background Traffic AM Peak Hour

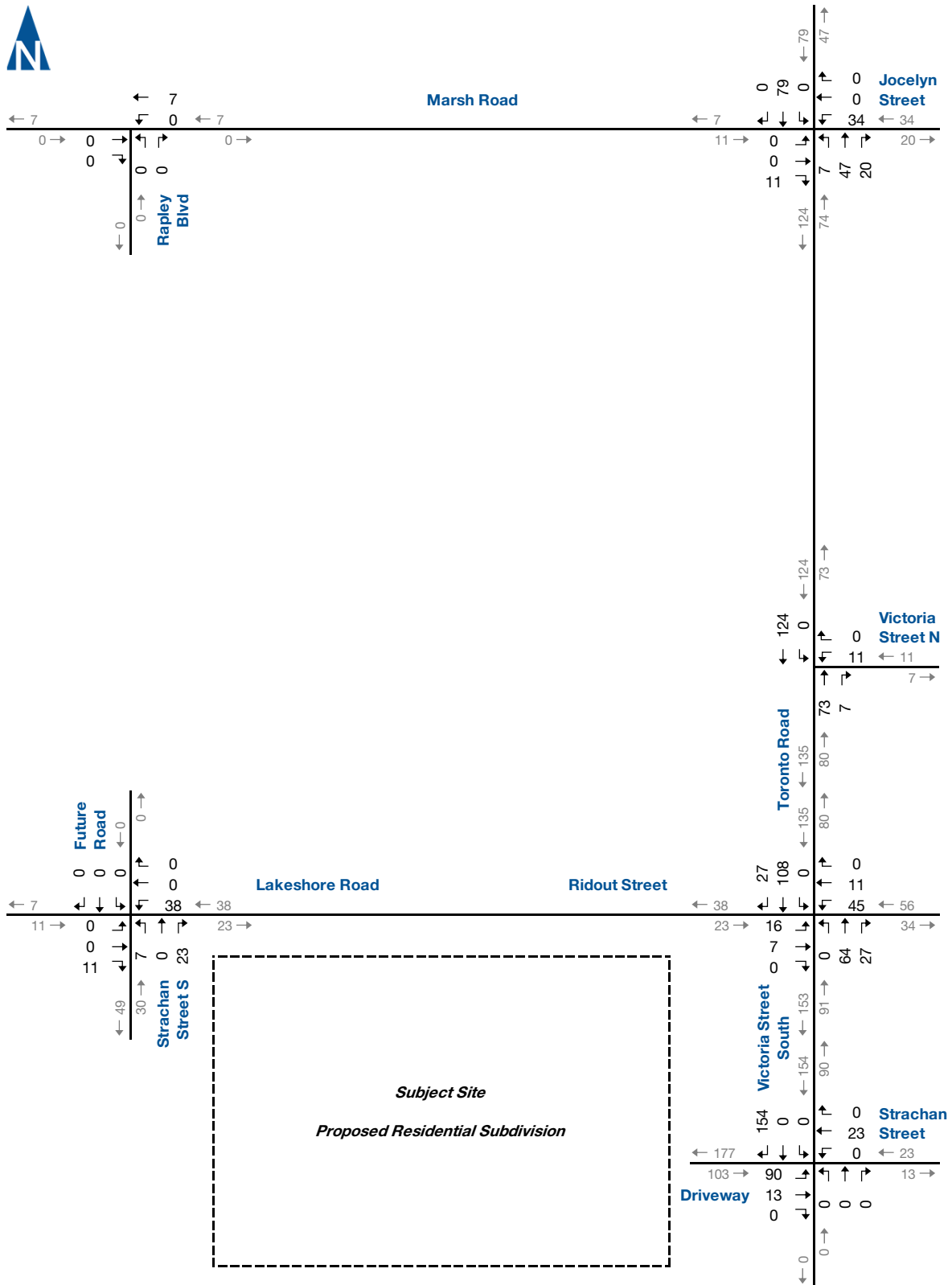




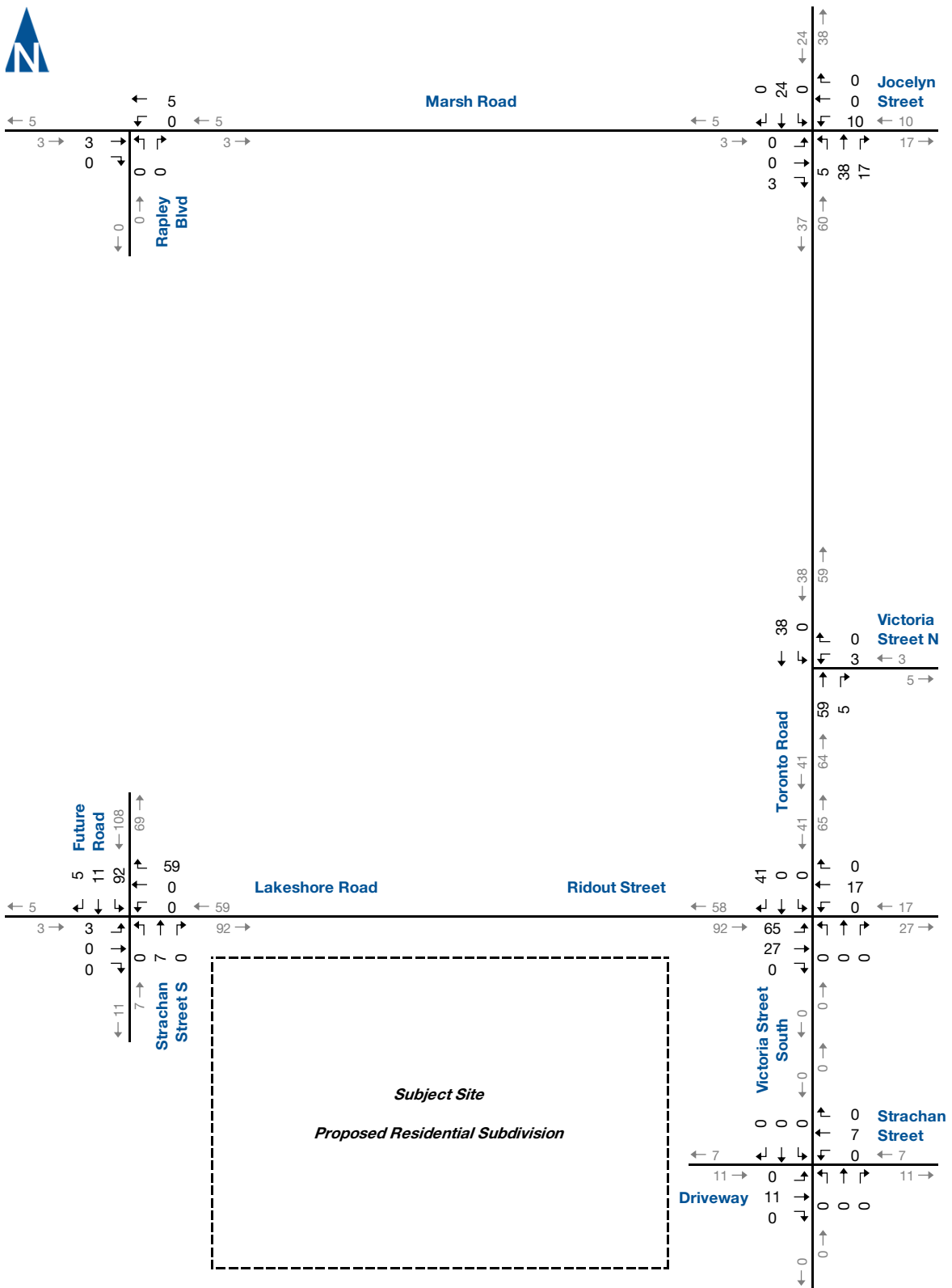
# 2022 Background Traffic PM Peak Hour



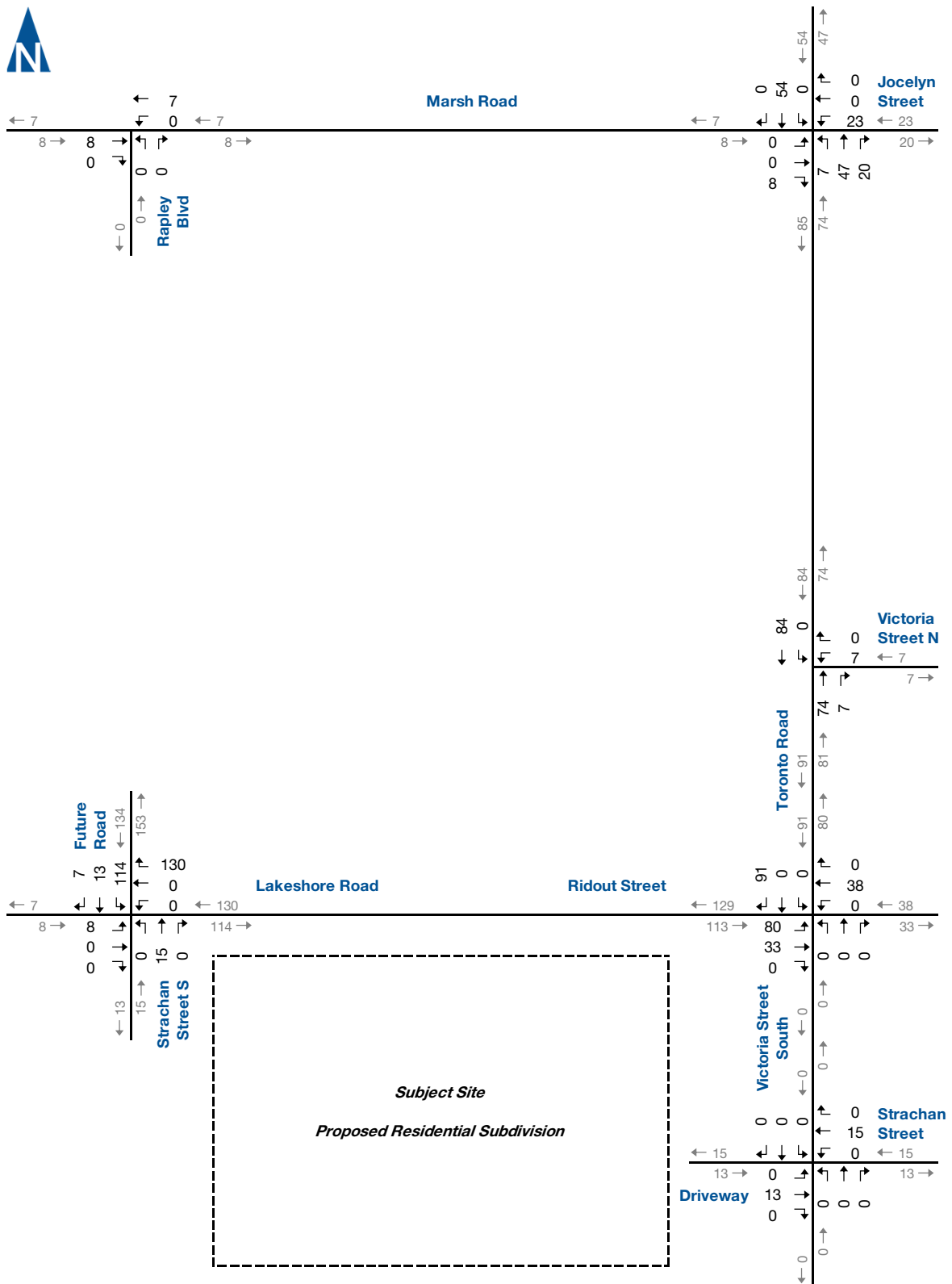
# Site Traffic, Phase 4 and Phase 5/9 AM Peak Hour



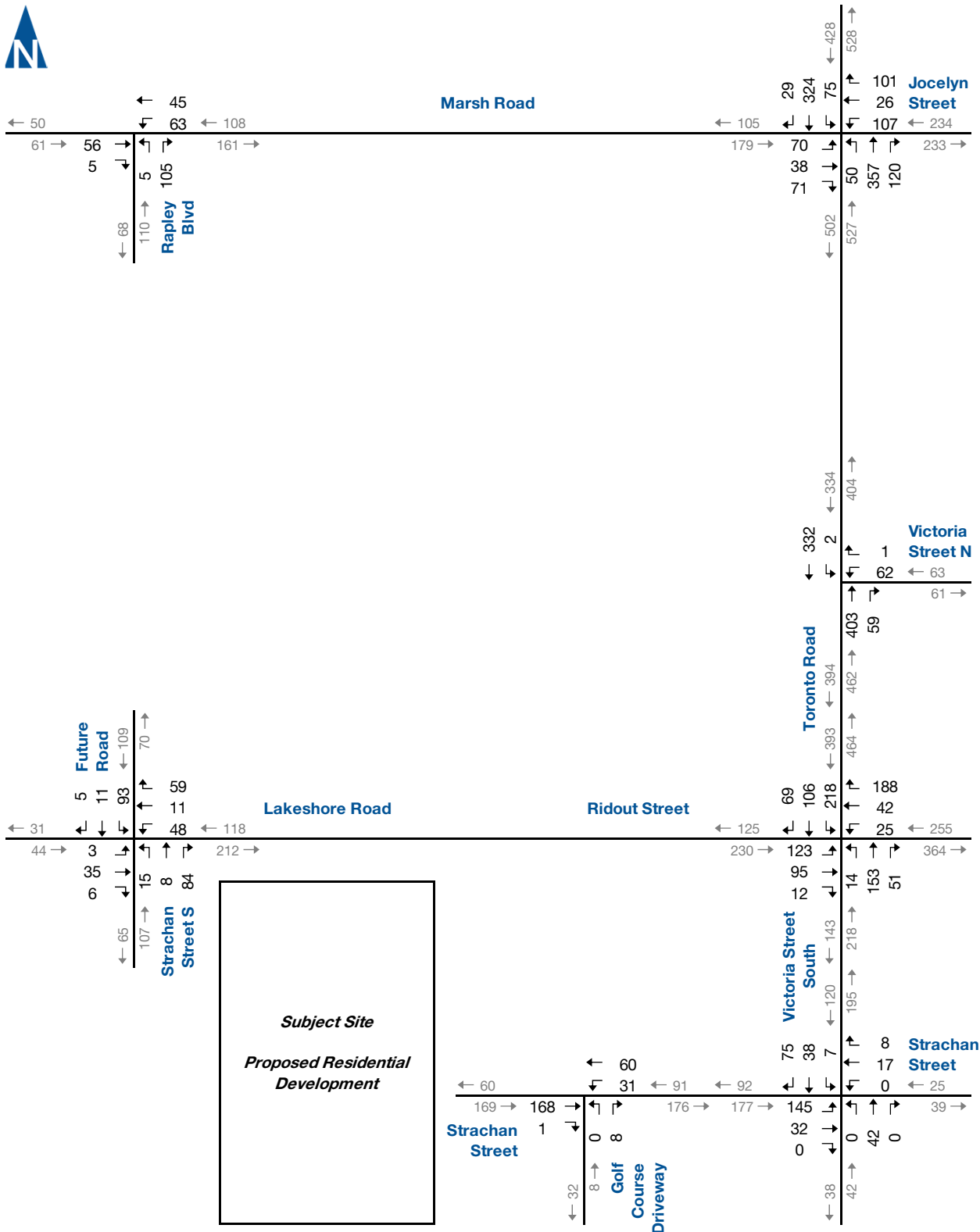
# Site Traffic, Phase 4 and Phase 5/9 PM Peak Hour



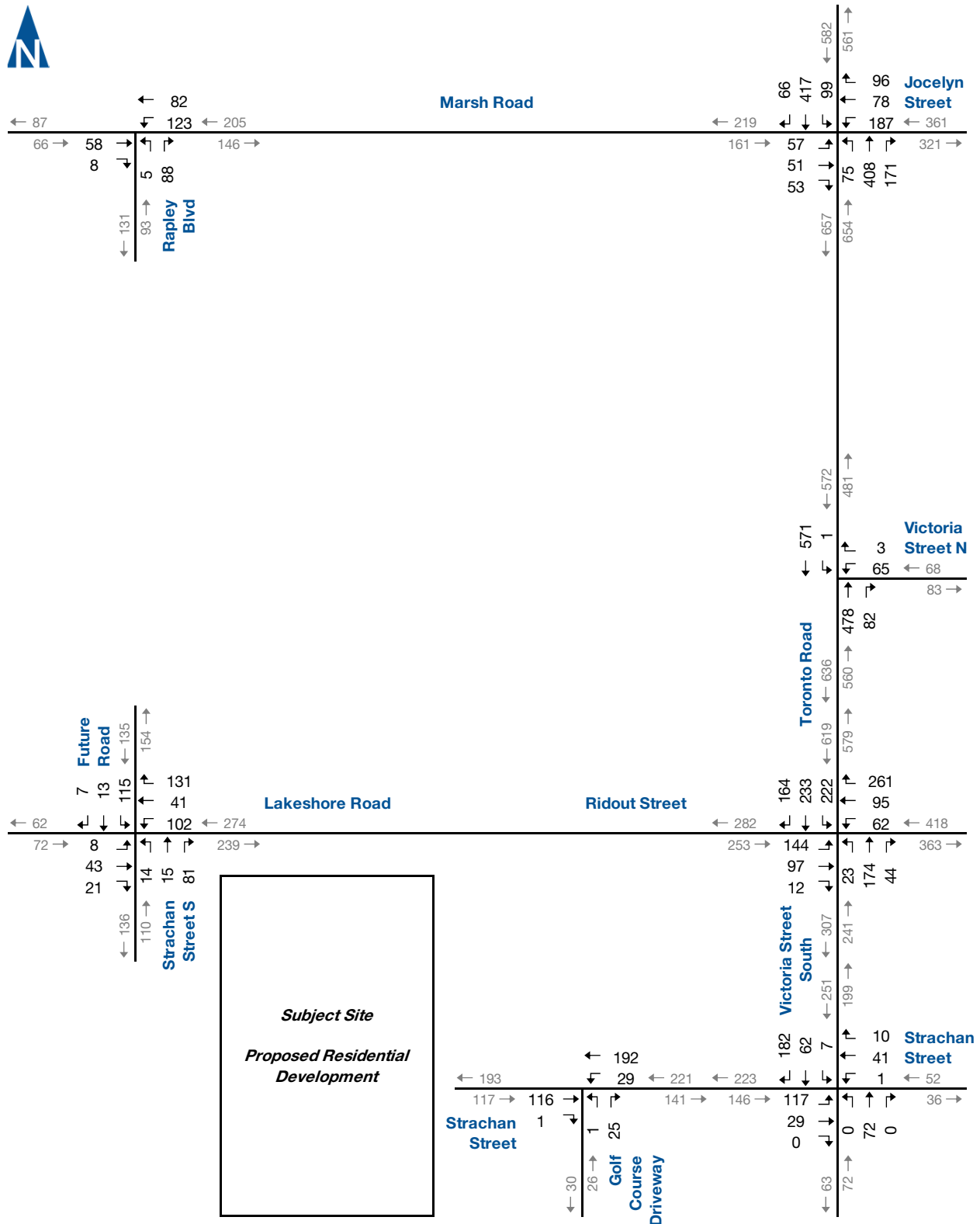
# Site Traffic, North of Lakeshore Road AM Peak Hour



# Site Traffic, North of Lakeshore Road PM Peak Hour



## 2022 Total Traffic AM Peak Hour

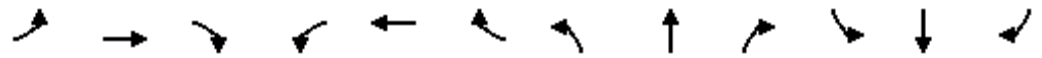


## 2022 Total Traffic PM Peak Hour

Lanes, Volumes, Timings

2022 Total - Scenario B - AM Peak Hour

4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street - Red Hope Residential Development TRIS



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	
Traffic Volume (vph)	123	95	12	25	42	188	14	153	51	218	106	69
Future Volume (vph)	123	95	12	25	42	188	14	153	51	218	106	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.968			0.941	
Flt Protected		0.974			0.982			0.997		0.950		
Satd. Flow (prot)	0	1780	0	0	1809	1568	0	1808	0	1719	1638	0
Flt Permitted		0.794			0.850			0.976		0.607		
Satd. Flow (perm)	0	1451	0	0	1566	1568	0	1770	0	1098	1638	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				224		34			72	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1052.7			168.4			235.6			89.2	
Travel Time (s)		75.8			12.1			17.0			6.4	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	4%	0%	0%	5%	3%	0%	2%	0%	5%	4%	17%
Adj. Flow (vph)	146	113	14	30	50	224	17	182	61	260	126	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	273	0	0	80	224	0	260	0	260	208	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	27.5	27.5		27.5	27.5	27.5	27.5	27.5		27.5	27.5	
Total Split (s)	27.5	27.5		27.5	27.5	27.5	27.5	27.5		27.5	27.5	
Total Split (%)	50.0%	50.0%		50.0%	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	22.5	22.5		22.5	22.5	22.5	22.5	22.5		22.5	22.5	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	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	
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)		22.5			22.5	22.5		22.5		22.5	22.5	
Actuated g/C Ratio		0.41			0.41	0.41		0.41		0.41	0.41	
v/c Ratio		0.46			0.12	0.29		0.35		0.58	0.29	
Control Delay		14.6			10.8	3.0		11.3		18.9	8.4	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	



Lanes, Volumes, Timings

2022 Total - Scenario B - AM Peak Hour

4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street Proposed Residential Development TRIS

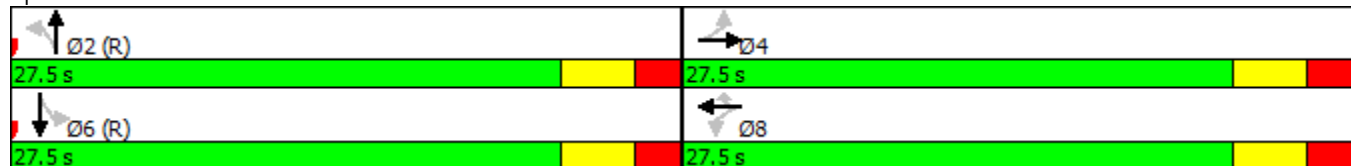


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		14.6			10.8	3.0		11.3		18.9	8.4	
LOS		B			B	A		B		B	A	
Approach Delay		14.6			5.1			11.3			14.3	
Approach LOS		B			A			B			B	

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	55
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	55
Control Type:	Pretimed
Maximum v/c Ratio:	0.58
Intersection Signal Delay:	11.6
Intersection LOS:	B
Intersection Capacity Utilization	55.7%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street



Queues

2022 Total - Scenario B - AM Peak Hour

4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street Port Hope Residential Development TRIS



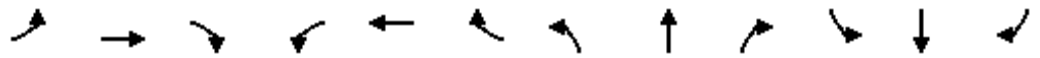
Lane Group	EBT	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	273	80	224	260	260	208
v/c Ratio	0.46	0.12	0.29	0.35	0.58	0.29
Control Delay	14.6	10.8	3.0	11.3	18.9	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	10.8	3.0	11.3	18.9	8.4
Queue Length 50th (m)	19.3	5.0	0.0	15.3	20.1	8.7
Queue Length 95th (m)	33.5	11.0	8.4	27.2	36.9	18.5
Internal Link Dist (m)	1028.7	144.4		211.6		65.2
Turn Bay Length (m)						
Base Capacity (vph)	597	640	773	744	449	712
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.13	0.29	0.35	0.58	0.29

Intersection Summary

HCM Signalized Intersection Capacity Analysis

2022 Total - Scenario B - AM Peak Hour

4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street Proposed Residential Development TRIS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	
Traffic Volume (vph)	123	95	12	25	42	188	14	153	51	218	106	69
Future Volume (vph)	123	95	12	25	42	188	14	153	51	218	106	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.99			1.00	0.85		0.97		1.00	0.94	
Flt Protected		0.97			0.98	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1780			1809	1568		1809		1719	1638	
Flt Permitted		0.79			0.85	1.00		0.98		0.61	1.00	
Satd. Flow (perm)		1450			1566	1568		1772		1098	1638	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	146	113	14	30	50	224	17	182	61	260	126	82
RTOR Reduction (vph)	0	4	0	0	0	132	0	20	0	0	43	0
Lane Group Flow (vph)	0	269	0	0	80	92	0	240	0	260	165	0
Heavy Vehicles (%)	3%	4%	0%	0%	5%	3%	0%	2%	0%	5%	4%	17%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		22.5			22.5	22.5		22.5		22.5	22.5	
Effective Green, g (s)		22.5			22.5	22.5		22.5		22.5	22.5	
Actuated g/C Ratio		0.41			0.41	0.41		0.41		0.41	0.41	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Lane Grp Cap (vph)		593			640	641		724		449	670	
v/s Ratio Prot											0.10	
v/s Ratio Perm		c0.19			0.05	0.06		0.14		c0.24		
v/c Ratio		0.45			0.12	0.14		0.33		0.58	0.25	
Uniform Delay, d1		11.8			10.1	10.2		11.1		12.6	10.7	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		2.5			0.4	0.5		1.2		5.4	0.9	
Delay (s)		14.3			10.5	10.7		12.3		17.9	11.6	
Level of Service		B			B	B		B		B	B	
Approach Delay (s)		14.3			10.6			12.3			15.1	
Approach LOS		B			B			B			B	

Intersection Summary		
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.52	B
Actuated Cycle Length (s)	55.0	Sum of lost time (s)
Intersection Capacity Utilization	55.7%	10.0
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

Lanes, Volumes, Timings

2022 Total - Scenario B - PM Peak Hour

4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street - Westhope Residential Development TRIS



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	
Traffic Volume (vph)	144	97	12	62	95	261	23	174	44	222	233	164
Future Volume (vph)	144	97	12	62	95	261	23	174	44	222	233	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.975			0.938	
Flt Protected		0.972			0.981			0.995		0.950		
Satd. Flow (prot)	0	1733	0	0	1809	1568	0	1817	0	1787	1747	0
Flt Permitted		0.731			0.801			0.941		0.605		
Satd. Flow (perm)	0	1303	0	0	1477	1568	0	1718	0	1138	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				284		25			78	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1052.7			168.4			235.6			89.2	
Travel Time (s)		75.8			12.1			17.0			6.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	9%	0%	5%	3%	0%	2%	0%	1%	2%	2%
Adj. Flow (vph)	157	105	13	67	103	284	25	189	48	241	253	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	275	0	0	170	284	0	262	0	241	431	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Minimum Split (s)	27.5	27.5		27.5	27.5	27.5	27.5	27.5		27.5	27.5	
Total Split (s)	27.5	27.5		27.5	27.5	27.5	27.5	27.5		27.5	27.5	
Total Split (%)	50.0%	50.0%		50.0%	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	22.5	22.5		22.5	22.5	22.5	22.5	22.5		22.5	22.5	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	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	
Total Lost Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	
Act Effct Green (s)		22.5			22.5	22.5		22.5		22.5	22.5	
Actuated g/C Ratio		0.41			0.41	0.41		0.41		0.41	0.41	
v/c Ratio		0.51			0.28	0.35		0.37		0.52	0.57	
Control Delay		16.1			12.5	3.1		12.0		17.2	13.6	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	

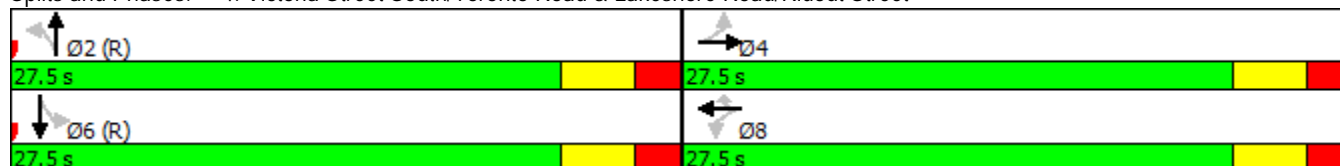


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		16.1			12.5	3.1		12.0		17.2	13.6	
LOS		B			B	A		B		B	B	
Approach Delay		16.1			6.6			12.0			14.9	
Approach LOS		B			A			B			B	

**Intersection Summary**

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	55
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	55
Control Type:	Pretimed
Maximum v/c Ratio:	0.57
Intersection Signal Delay:	12.4
Intersection LOS:	B
Intersection Capacity Utilization	68.3%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street



Queues

2022 Total - Scenario B - PM Peak Hour

4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street Port Hope Residential Development TRIS



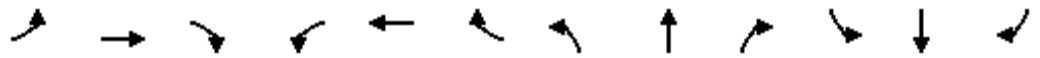
Lane Group	EBT	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	275	170	284	262	241	431
v/c Ratio	0.51	0.28	0.35	0.37	0.52	0.57
Control Delay	16.1	12.5	3.1	12.0	17.2	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	12.5	3.1	12.0	17.2	13.6
Queue Length 50th (m)	20.1	11.3	0.0	16.2	18.0	26.3
Queue Length 95th (m)	39.4	23.1	11.5	31.2	36.9	50.1
Internal Link Dist (m)	1028.7	144.4		211.6		65.2
Turn Bay Length (m)						
Base Capacity (vph)	536	604	809	717	465	760
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.28	0.35	0.37	0.52	0.57

Intersection Summary

HCM Signalized Intersection Capacity Analysis

2022 Total - Scenario B - PM Peak Hour

4: Victoria Street South/Toronto Road & Lakeshore Road/Ridout Street Prothome Residential Development TRIS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	
Traffic Volume (vph)	144	97	12	62	95	261	23	174	44	222	233	164
Future Volume (vph)	144	97	12	62	95	261	23	174	44	222	233	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.99			1.00	0.85		0.98		1.00	0.94	
Flt Protected		0.97			0.98	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1732			1808	1568		1818		1787	1747	
Flt Permitted		0.73			0.80	1.00		0.94		0.61	1.00	
Satd. Flow (perm)		1303			1477	1568		1719		1139	1747	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	105	13	67	103	284	25	189	48	241	253	178
RTOR Reduction (vph)	0	3	0	0	0	168	0	15	0	0	46	0
Lane Group Flow (vph)	0	272	0	0	170	116	0	247	0	241	385	0
Heavy Vehicles (%)	7%	4%	9%	0%	5%	3%	0%	2%	0%	1%	2%	2%
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		22.5			22.5	22.5		22.5		22.5	22.5	
Effective Green, g (s)		22.5			22.5	22.5		22.5		22.5	22.5	
Actuated g/C Ratio		0.41			0.41	0.41		0.41		0.41	0.41	
Clearance Time (s)		5.0			5.0	5.0		5.0		5.0	5.0	
Lane Grp Cap (vph)		533			604	641		703		465	714	
v/s Ratio Prot												c0.22
v/s Ratio Perm		c0.21			0.12	0.07		0.14		0.21		
v/c Ratio		0.51			0.28	0.18		0.35		0.52	0.54	
Uniform Delay, d1		12.1			10.9	10.4		11.2		12.2	12.3	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		3.5			1.2	0.6		1.4		4.1	2.9	
Delay (s)		15.6			12.0	11.0		12.6		16.3	15.2	
Level of Service		B			B	B		B		B	B	
Approach Delay (s)		15.6			11.4			12.6			15.6	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group