



## EXECUTIVE SUMMARY

T.Y. Lin International was retained to prepare a Traffic Impact Study (TIS) in support of an Official Plan Amendment (OPA), Zoning By-Law Amendment (ZBA), and redline revision to the Approved Draft Plan of Subdivision applications for the Secondary Mixed-Use Node (SMUN) Lands located south of Louis St. Laurent Avenue, west of Bronte Street South, and east of the Canadian National (CN) Railway, in the Town of Milton. The development consists of retail, medium-density residential, high-density residential blocks, and a planned district park.

This report determines the site-related traffic impacts on the adjacent road network during the weekday a.m., p.m., and Saturday mid-day peak hours from the proposed development. These impacts are based on projected future background traffic and road network conditions derived for 2025 baseline conditions and a 2032 (five-year post build-out) planning horizon. The originally proposed 2026 horizon from the previous April 2022 submission is consistent with planning horizons assessed in the Boyne Roads Network Assessment (RNA) 2017 study. As part of the updated draft plan and resubmission, it was requested by Town Staff that a 2032 (five-year post build-out) be assessed in this updated study to reflect the anticipated timing of construction. Development traffic generated in the Boyne RNA was used to develop future traffic volumes for the study area.

Based on the proposed preliminary SMUN Lands concept plan, vehicular access to the subdivision will be provided via the main boundary roads of Bronte Street South and Louis St. Laurent Avenue. An additional access is provided via the future west leg of the roundabout intersection of Bronte Street South and Whitlock Avenue that extends as a 90-degree bend connection. A concept plan has been provided that includes a T-intersection to demonstrate the potential connection to the future District Park.

The non-residential blocks of the proposed development are expected to generate a total of 309 new two-way trips in the weekday a.m. peak hour, consisting of 186 inbound and 123 outbound trips. A total of 539 two-way trips are anticipated to be generated in the p.m. peak hour, consisting of 186 inbound and 123 outbound trips. During the Saturday peak hour, a total of 840 new two-way trips are expected to be generated, consisting of 451 inbound and 389 outbound trips. The residential blocks are expected to generate a total of 271 trips during the a.m. peak hour, with 64 inbound and 207 outbound trips. The p.m. peak hour is expected to generate a total of 176 new two-way trips, consisting of 106 inbound and 70 outbound trips. During the Saturday peak hour, a total of 244 new trips are anticipated to be generated, with 129 inbound and 115 outbound trips. This results in the total net new site trips of 582 during the a.m. peak hour, 719 during the p.m. peak hour, and 1,090 during the Saturday peak hour. The trips generated for Saturday represent a conservative estimate as each of the uses had their trips generated independently at the “peak

hour of generation” and the peak hours do not necessarily align.

The findings from this study determined that a southbound right-turn lane should be considered at the intersection of Bronte Street South and Louis St. Laurent Avenue to address traffic constraints in the future background traffic scenario. This would be in addition to the planned dedicated right-turn lanes for each other direction of travel that were proposed in the Boyne RNA for this intersection. This recommendation was based on the projected future background 2032 horizon, due to the conflicting pedestrians and significant traffic estimated from Boyne, there was queuing that propagated back through the network. Permissive overlap right-turn phases were added where necessary during the corresponding left-turn phase to allow for vehicles to clear from the storage at the same intersection. The site will use the existing westbound left-turn lane on Louis St. Laurent Avenue at its signalized access, which had been previously constructed.

With the addition of planned Boyne improvements and the additional southbound right-turn lane at Bronte Street South and Louis St. Laurent Avenue in both the future background and future total 2032 traffic horizons, the study area intersections are expected to operate with good operational characteristics and reserve capacity during the weekday a.m., p.m., and Saturday peak hours.

Roundabout analysis was conducted at Bronte Street South and Whitlock Avenue and demonstrates that the intersection operates well with reserve capacity and low delays.

Queuing analysis indicated that there were some queues that exceed their storage bays at the 95<sup>th</sup> percentile starting in the future background horizon. It is recommended that the traffic volumes be monitored by the Town to determine if the Boyne RNA projected volumes occur at Bronte Street South and Louis St. Laurent Avenue as based on the queuing analysis in the future background horizon, the currently proposed storage lengths from Boyne are not enough to accommodate the 95<sup>th</sup> percentile queues. As noted in the report, this does not necessarily result in spillback to other intersections and is primarily associated with the significant increase in background traffic. Based on the projected site volumes at this critical intersection, it is likely that resolving the issues associated with the background conditions would alleviate the queuing seen for the future total conditions.

This study concludes that the traffic generated by the proposed subdivision can be accommodated by the boundary road network, factoring in future road improvements and the development of the interior local road network.

The proposed draft plan includes ample facilities to accommodate active transportation around and through the site with connections to the district park which includes an active transportation link over the adjacent CN Rail line. This connection allows for non-vehicle traffic to cross between the east and west development blocks.

The recommended Transportation Demand Management measures for the proposed development

would be implemented at all levels to help encourage non-auto travel modes. It is noted that TDM measures do not work in isolation, but would be implemented to provide an overall shift in behavioural change towards encouraging and supporting non-auto travel modes. These work to provide many benefits to the community such as creating a more livable environment, reducing greenhouse gas emissions, reducing traffic congestions and improving the overall commuter experience.

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# 1 INTRODUCTION

TYLin has been retained by 1000118982 Ontario Limited (Fieldgate Developments) to assist in obtaining the necessary approvals to permit the Proposed Development of the property generally located on the south side of Louis St. Laurent and west side of Bronte Street South, east of the Canadian National Railway tracks. The Subject Lands are legally described as Part of Lots 7 & 8, Concession 1, New Survey. The entire Draft Plan of Subdivision lands which were Draft Plan Approved in January 2024 and which are subject to the proposed red lined revision consist of 36.5 ha (90.19 acres) and the portion of the Subject Lands that are subject to the proposed Official Plan Amendment and Zoning By-Law Amendment (northern portion of Draft Plan of Subdivision) have an area of 14.74 hectares (36.42 acres). All lands are currently vacant.

Applications were previously processed and approvals were granted for these lands related to an Official Plan Amendment (OPA No. 77 enacted in March 2023), Zoning By-Law Amendment (By-Law No. 018-2023 enacted in March 2023) and Draft Approved Plan of Subdivision (24T-21005/M approved in January 2024) to permit the development of high density residential uses, townhouse residential uses, commercial uses (all inside of the Secondary Mixed Use Node), a district park, active transportation link, NHS channel, related NHS buffers, and the servicing and stormwater management blocks.

This report has been prepared to support the applications which seek to modify the Draft Approved Plan of Subdivision through a red line revision to create a resized 'Secondary Mixed Use Node' (SMUN) consisting of a commercial component and a high density residential component. Specifically, the SMUN is proposed to consist of three blocks comprised of 2 commercial blocks and one high density residential block, consisting of 6.33 ha (15.64 ac) in total. The applications also seek to facilitate ground-related townhouse development beyond the limits of the SMUN on a new public road network within the northern portion of the Draft Plan of Subdivision.

The proposed resized SMUN and reconfiguration of the townhouse development beyond the limits of the SMUN requires an Official Plan Amendment and Zoning By-Law Amendment. Overall, the development proposal in the northern portion of the Draft Plan of Subdivision consists of townhouses, high-density residential uses, and commercial uses. The modification of the SMUN will now exclude the grade related residential units. The southern portion of the Draft Plan of Subdivision (consisting of the district park, active transportation link, NHS channel, related NHS buffers, and the servicing and stormwater management blocks) is not proposed to be changed through this application.

This study establishes baseline traffic conditions for the study area, prepares forecasts for future background traffic growth, and assesses the operating conditions for the study area road network for baseline (2025) and future conditions. Based on discussions with Town Staff, a future 2032 (five-

year post build-out) planning horizon is considered for this study.

The objective of this study is to determine the traffic volumes anticipated to be generated by the proposed development during the critical weekday a.m., p.m., and Saturday peak periods; to assess the impact of this traffic on the existing and future road network, and recommend improvements to accommodate the projected traffic if any are needed.

A traffic study, dated April 2022, has previously been submitted by TYLin (formerly known as TMIG) for the Town of Milton and Halton Region staff to review. This updated study has been prepared based on the updated Draft Plan dated June 16, 2025. Correspondence with the Town regarding an updated horizon year and new turning movement counts have been included in **Appendix A**.

## 2 DEVELOPMENT CHARACTERISTICS

### 2.1 Study Environment

The proposed multi-use development is located within the Town of Milton, in a predominantly greenfield area. The site is located in the Boyne Survey East Tertiary Plan in the southwest quadrant of Bronte Street South and Louis St. Laurent Avenue. The subject site is bordered by the Canadian National (CN) Railway to the west, Bronte Street South to the east, and Louis St. Laurent Avenue on the north. The general study area and road network is shown in **Figure 2-1**.

This TIS provides an assessment of the baseline (2025) and full build-out (2032) external road networks, which include accesses to the site upon full build-out. Based on a review of the study area, the following study intersections were selected to be analyzed in support of the proposed Draft Plan:

- ▶ Bronte Street South and Louis St. Laurent Avenue
- ▶ Bronte Street South and Whitlock Avenue / Future Site Access
- ▶ Louis St. Laurent Avenue and North Site Access (future conditions)
- ▶ Bronte Street South and East Site Access, right-in/right-out (future conditions)

**Figure 2-1 Study Area – East Lands**

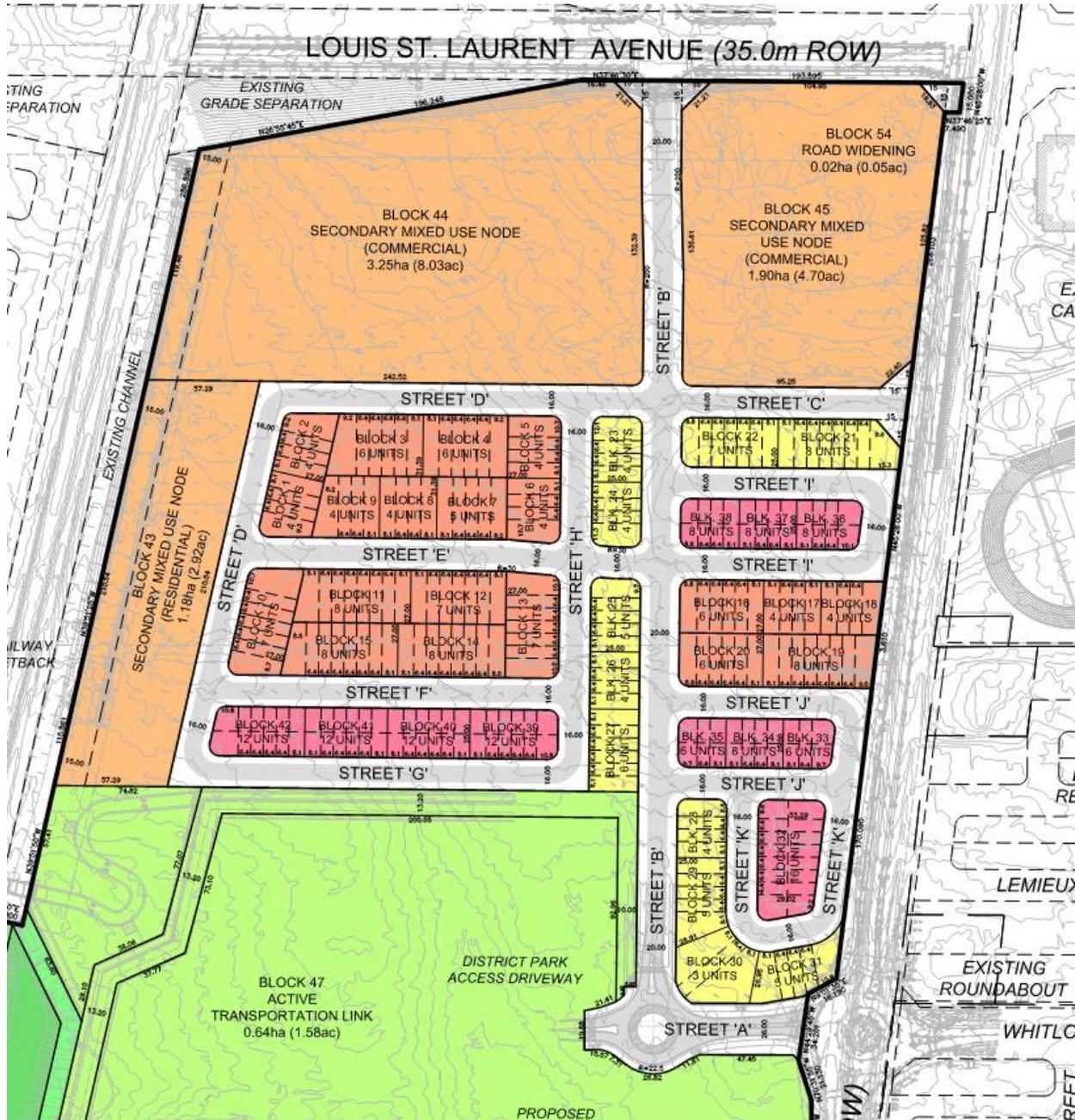


## 2.2 Development Context

The multi-use development is divided into 45 blocks that include commercial and residential land uses, as shown in **Figure 2-2**, the SMUN Lands comprehensive plan prepared by GSAI with the commercial concept plan prepared by Turner Fleischer Architects, the full Draft Plan is included in **Appendix B** for reference. Blocks 1 to 42 proposes medium-density townhouses, Block 43 proposes high-density apartment buildings, and Blocks 44 and 45 consists of commercial land use with the current concept prepared that includes 9 separate buildings. Block 46-53 are associated with the district park, green channel, and stormwater management facilities. The proposed multi-use development is summarized as follows:

- ▶ Blocks 1 to 42: 277 townhouse dwellings
- ▶ Block 43: high-rise residential units (three 15-storey apartment buildings) for a total of 477 residential units
- ▶ Blocks 44 to 45: total gross floor area (GFA) of all 9 buildings – 13,734 m<sup>2</sup> (147,833 ft<sup>2</sup>)

**Figure 2-2 Preliminary SMUN Lands Concept Plan**



### 2.3 Proposed Draft Plan

The proposed Draft Plan provided by GSAI, dated June 16, 2025, identifies non-residential blocks and residential blocks in the north half of the Draft Plan with the district park in the south half of the Draft Plan. Vehicular access to the development is proposed via a full-moves access to Louis St. Laurent Avenue, one right-in / right-out (RI/RO) access on Bronte Street South, and the construction of the west leg of the existing roundabout at Bronte Street South and Whitlock

Avenue. The west leg of the roundabout is proposed is to be extended at a 90-degree bend, providing direct access to the planned residential developments. The proposed Draft Plan illustrating the planned road network and residential development blocks is provided in **Figure 2-2**.

## 2.4 Draft Plan Review

TYLin completed a review of the proposed Draft Plan of Subdivision design for the SMUN lands. The proposed design was evaluated based on the standards set forth by the Town of Milton 2024 Engineering and Parks Standards Manual (EPSM), the Tertiary Plan completed for the Boyne Survey Area as well as the Transportation Association of Canada (TAC) 2017 Geometric Design Guide for Canadian Roads.

It is considered that the design of the roadways is deemed acceptable and detailed review and findings have been summarized below.

### 2.4.1 Right-of Way (ROW)

Except for Street 'A', the proposed Draft Plan of Subdivision for the SMUN lands ROW widths of collector roads and local roads summarized in **Table 2-1** below comply with the requirements specified in the Town's EPSM.

**Table 2-1 Proposed Right-of-Way**

ROW Types	Street Name	Design Requirement	
		Town of Milton	EPSM Std. No.
<b>Major Collector Roads</b>	Street 'A'	26m (modified)	01-26.01
<b>Local Road</b>	Street 'B'	20m	01-20.02 01-20.03
	Streets 'C' to 'K'	16m	01-16.01 01-16.02

The modified 26-meter collector road proposes one travel lane in each direction and 3.0m multi use paths (MUP) on both sides of the roadway. Due to the short midblock section of road between Bronte Street South and Street 'B' on-street parking and bike lanes are not provided. The justification for providing the MUP on both the north and south sides of Street 'A' is to provide the necessary facilitating infrastructure for pedestrians/cyclists. There are currently existing bike lanes

on both sides of Whitlock Avenue east of Bronte Street South, and initially the intent of the Boyne Survey Area Tertiary Plan was to continue these bike lanes along Street 'A'. Through discussion with Town Staff, it was agreed that rather than providing bike lanes for the short midblock along Street 'A', it would be reasonable to extend the 3.0m MUP along the north and south sides. With the MUP's installed in place of the bike lanes/proposed sidewalk, this would provide ample space for both cyclists and pedestrians to safely and comfortably travel along this section of road.

The north-south 20m local road cross-section road proposes two 3.35m travel lane, 1.5m sidewalk and 1.4m bike lanes on both sides of the roadway. The cross-section of 16 meters local road would include two 4.0m travel lane and a 1.5m sidewalk on one or both sides of the roadway.

### 2.4.2 Traffic Circle and Connection to District Park

The traffic circle located at the west leg of the Whitlock Avenue extension (Street A) providing access to the district park has been reviewed for vehicle maneuvering. As a part of the review, a WB-20 tractor trailer was manoeuvred in and out of the development, using the traffic circle and travelling along the north-south roadway. It is recommended that the proposed centre island and splitter island at the traffic circle be mountable to accommodate larger trucks. However, given the nature of the proposed developments in this area, it is not expected that large tractor trailers would frequently maneuver through the roundabout. Vehicle movement diagrams are provided in

**Appendix C.**

### 2.4.3 Intersection Spacing and Daylighting

Based on Table 1.2 of the Town of Milton Engineering and Park Standards Manual, the minimum spacing requirements between adjacent intersections along local and collector roads along with the daylighting requirements at each intersection is identified. The intersection characteristics per the Town's requirements are summarized in **Table 2-2.**

**Table 2-2 Intersection Spacing Requirements**

Intersection Type	Daylighting (m)	Minimum Intersection Spacing (m)
Local / Laneway	5 – Radius	60
Local / Local	5 – Radius	60
Local / Collector	7.5 – Triangle	60
Collector / Collector	10 – Triangle	60
Arterial / Local	15 – Triangle	400
Arterial / Collector	15 – Triangle	400
Arterial / Arterial	15 – Triangle	400

*Note: Three-legged intersections may be spaced a minimum of 40 m (TAC Section 2.3.1.7)*

The external site intersections along Louis St. Laurent Avenue and Bronte Street South were measured against the above intersection characteristic requirements. The proposed concept road network and intersection spacing satisfies the above requirements.

Additionally, the minimum distance between driveways for an arterial road is 70 metres based on Figure 8.8.2 of TAC Chapter 8 Access Guidelines. The zone where the right-in/right-out access to Bronte Street could be located is identified in **Appendix C**. This zone is generally 70 metres south of Whitlock Avenue and 70 metres north from the existing Elsie MacGill Public Secondary school.

#### **2.4.4 Sight Distance**

The minimum stopping sight distance based on the Town of Milton Engineering and Park Standards Manual for the road network is as follows:

- ▶ Laneway (40 km/h design speed): 45 metres
- ▶ Local (50 km/h): 65 metres
- ▶ Collector (50 or 60 km/h design speed): 65 or 85 metres
- ▶ Arterial (60 or 80 km/h design speed): 85 or 140 metres

The smaller values are for minor roads and the larger values are for major roads. Stopping sight distances were assessed at apparent potential critical locations along the proposed road network and none were identified as substandard to the above guidelines.

A more detailed review of the proposed accesses, roadways, intersections, and transportation elements of the proposed development will be conducted in support of a site plan application submission.

## 3 EXISTING CONDITIONS

### 3.1 Road Network

A description of the existing roads within the study area are summarized below. Road classifications were determined using Schedule F from the Town of Milton Official Plan, appended in **Appendix D**.

**Louis St. Laurent Avenue** is an existing east-west minor arterial road that has a four-lane cross-section with a raised median island under the jurisdiction of the Town of Milton. On-street bicycle lanes are provided along both curb lanes, and multi-use trails are located on both sides of the road to provide active transportation connections. The road operates with a posted speed limit of 60 km/h within the study area.

**Bronte Street South** is an existing north-south minor arterial road that has a four-lane cross-section and is under the jurisdiction of the Town of Milton. On-street bicycle lanes are provided along both curb lanes. Multi-use trails are located along the east side of the road within the vicinity of the site, and along west side of the road until approximately 250 metres south of Louis St. Laurent Avenue. The road operates with a posted speed limit of 60 km/h within the study area. It is noted that there are future planned updates to the ultimate condition of the west boulevard of Bronte Street South. These improvements, proposed to be constructed in 2023, are outlined in **Section 4.2**.

**Whitlock Avenue** is an existing east-west local road that has a two-lane cross-section and is under the jurisdiction of the Town of Milton. On-street bicycle lanes are provided along both curb lanes, and a sidewalk and multi-use path is provided on the north and south sides of the road respectively. The southern-most site access is proposed to connect to the west leg of this roundabout as a private site access in the future conditions. This road operates with an unposted statutory speed limit of 40 km/h.

### 3.2 Transit Network

The relevant routes, with existing stops located within proximity of the study site are summarized as follows:

- ▶ **Route 9a Ontario South** is a bus route that provides service to the Milton GO Station from the subject site. Route 9a runs along Bronte Street South within the study area, traveling south to loop around Britannia Road and Etheridge Avenue, then travelling north along Regional Road 25 / Ontario Street, and eventually reaching the final destination of the Milton GO Station.

- ▶ **Route 8 Willmott** also provides bus service to the Milton GO Station. However, this route runs along Bronte Street South north of the study area, and Louis St. Laurent Avenue east of the study site.

### 3.3 Pedestrian & Cycling Network

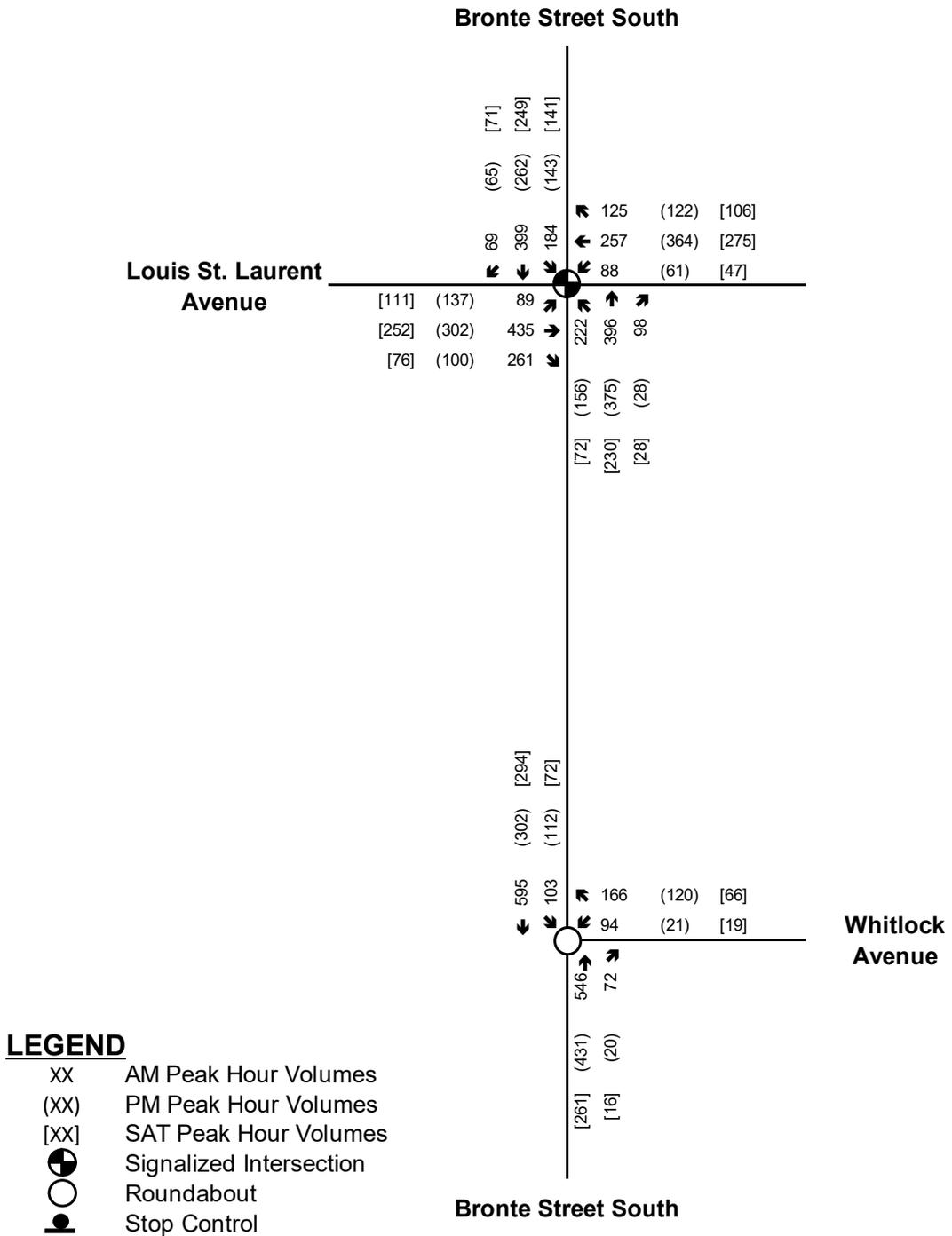
Currently, there are multi-use trails along both sides of Louis St. Laurent Avenue and along the east side of Bronte Street South (the multi-use trail along the west side of Bronte Street South terminates approximately 250 metres south of Louis St. Laurent Avenue), within the study area. Additionally, there are on-street bicycle lanes provided along both sides of Louis St. Laurent Avenue, Bronte Street South, and Whitlock Avenue.

### 3.4 Baseline Traffic Volumes

The previous submissions utilized turning movement counts collected in October 2019. Through discussions with Town Staff, they have requested that new turning movement counts be collected and used to reflect current conditions and provide a more up to date assessment. Updated turning movements counts at the study intersections were collected on June 11, 2025. A summary of collected data is included in **Appendix E. Figure 3-1** summarizes the 2025 baseline traffic volumes during the weekday a.m., p.m. and Saturday mid-day peak hours.

It is noted that there is an imbalance of trips between the two existing baseline intersections. This is primarily due to the existing Secondary school located on the east side of Bronte Street South between the two intersections which functions as a primary destination for many motorists. For example, a parent travelling from the north of Louis St. Laurent Avenue may travel south through Bronte Street South and return to the north after picking up their child within the same peak hour without traversing Whitlock Avenue.

**Figure 3-1 2025 Baseline Traffic Volumes**



## 4 FUTURE BACKGROUND TRAFFIC

### 4.1 Study Horizon Years

In the previous submission, the proposed development was assessed based on 2026 study horizon year, which was consistent with the 2017 Boyne Secondary Plan Survey Area Road Network Assessment (Boyne RNA). Through discussion with Town Staff, an updated study horizon year of 2032 was considered in this submission to reflect the appropriate construction timeline of the proposed development.

### 4.2 Study Area Roadway Network Improvements

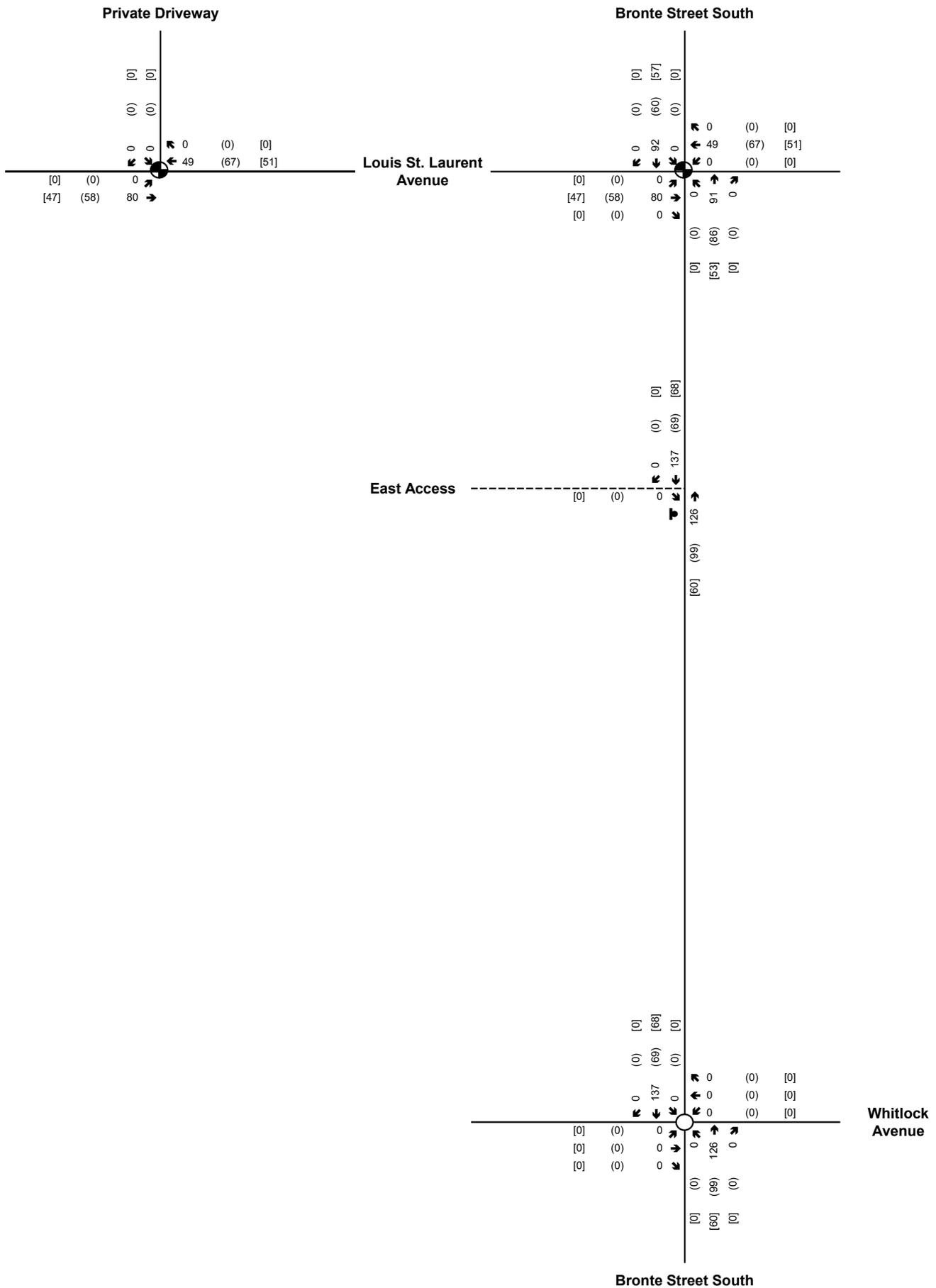
Although the Town of Milton has completed several expansion projects on Louis St. Laurent Avenue over the last 10 years, there are no anticipated road improvements such as widening or traffic operations changes proposed for the study area roadways within the 2032 planning horizon.

As per confirmation with the Town of Milton, improvements along the west side of Bronte Street South is anticipated to begin construction in 2023; this includes a 3-metre multi-use path on the roadway's west boulevard similar to the current east side. Other active transportation networks will likely be provided in conjunction with the building of new roads through the study area, through 2032. Local transit network expansions would occur closer to full build-out in order to improve travel options for residents and have positive impacts in reduction of auto trips in the study area. See **Section 11** for more details about proposed active transportation connections. As a conservative approach, these non-auto infrastructure improvements are not expected to have a significant impact on the overall traffic operations of the study area.

### 4.3 Background Corridor Growth

Based on available data provided by the Region, the Town, and the Boyne RNA Study, a 2.45% annual growth rate was applied to Louis St. Laurent Avenue traffic, and a 3.00% annual growth rate was applied to Bronte Street South traffic. The growth rates were applied to through movements only along these roadways and is consistent with the previous traffic study.

Background corridor growth traffic volumes for the 2032 planning horizon are provided in **Figure 4-1**.



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ◉ Signalized Intersection
- Roundabout
- Stop Control

**Figure 4-1**  
**Background Corridor Growth 2026 Traffic Volumes**

## 4.4 Background Developments

The following developments within the vicinity of the subject site, as determined through discussions with the Town, were identified as background developments of which site traffic volumes were extracted from the most current transportation study drafts available at the time of the first submission.

- ▶ Mattamy Varga Subdivision
- ▶ Pony Pines Subdivision
- ▶ Milton Main Street Homes Subdivision
- ▶ Elsie MacGill Secondary School
- ▶ Manaman Centre
- ▶ Loblaws Supermarket adjacent to Manaman Centre (see **Section 4.4.1**)
- ▶ District Park

Since the previous submissions, several background developments have been fully built-out and occupied or partially built-out. The development that has been fully built out and in service is the Elsie MacGill Secondary School. This background development was not accounted for in the background analysis of this updated study, as the 2025 turning movement counts would have already captured the existing traffic generated by this development.

The development that has been partially built out and occupied at the time of this report is the Mattamy Varga Subdivision. Occupancy numbers were estimated based on the total number of built-out units which were identified through recent aerial imagery. The estimated percentage of total occupancy for the Mattamy Varga Subdivision development is approximately 75%, with the remaining 25% expected to be constructed within the 2032 horizon year. As detailed trip generation was not available, 25% was applied to the site traffic volumes for the background development used in the previous reports to estimate the traffic volumes generated by the unbuilt portion. Occupancy reference documents are provided in **Appendix F**.

Note that the District Park is a part of the lands within the Draft Plan, however as requested in the Town comment's TOR it has been considered as a background development for the purposes of the analysis, with the traffic maintained from the original Boyne RNA estimates. This is since although the lands are included in the Draft Plan, the final configuration, programming, access, and parking needs will need to be assessed once the District Park plan is completed by the Town.

The Boyne RNA originally assigned all district park trips to a single access point on the west side of Bronte Street South at Whitlock Avenue. Through discussions with Town staff after the first submission of the TIS, the possibility of a secondary right-in/right-out (RI/RO) access south of Whitlock Avenue was identified. Accordingly, a portion of the southbound inbound and outbound

district park traffic on Bronte Street South was re-routed to the southern RI/RO access for analysis purposes based on engineering judgement.

The background development site traffic volume figures provided by the Town for the purposes of generating background traffic for this report, as well as a summary of the total background development volumes are provided in **Appendix F. Figure 4-2** shows the total background developments traffic volumes. It was assumed for analysis purposes that all background developments would be fully built-out by the 2032 planning horizon.

Site traffic attributable to Fieldgate's proposed residential development located to the west of the CNR corridor and south of Louis St. Laurent Avenue was also considered as background development traffic and as such, was included as part of the future background 2032 traffic volumes.

#### 4.4.1 Commercial Development (Supermarket)

For the first submission of the TIS (July 2021), Town Staff identified a commercial development (Supermarket) as a background development, immediately north of the subject site on the north side of Louis St. Laurent Avenue. At the time the second submission of the TIS was prepared, the ownership of the commercial lands had changed, and the site was preliminarily reimagined as a townhouse condo development instead of a supermarket. For the current submission, the previously assumed townhouse condo development is now anticipated to be reverted back to a commercial development.

Given that the first submission of the TIS originally analyzed the development as a commercial land use and confirmed that all study intersections are forecasted to operate with reserve capacity and acceptable delays, it is TYLin's opinion updating the traffic volumes of the background development would not have a significant impact on the analysis. This is primarily because the first submission TIS provided a more conservative result as it assumed a higher residential unit count and higher gross floor area of commercial land use for the study site (SMUN Lands), which resulted in more trips generated compared to the current study site's statistics outlined in **Section 5.1**. If the background development traffic were to be updated to reflect the commercial use as opposed to the townhouse condo development, the results are still expected to perform similar or better than those in the first submission. As a result, trips generated and distributed from the previously assumed townhouse condo development instead of a supermarket from the second submission were maintained in the analysis of this report for consistency with the second submission.

As stated from the second submission of the TIS, TYLin replaced the previously provided commercial background site traffic assignment provided by the Town with an estimate of site traffic generated by the future residential development due to the difference in trip generation characteristics between the two land uses. Accordingly, trip generation estimates were undertaken based on a preliminary concept plan provided to TYLin, and the estimated background site traffic was assigned to the study area network using the same residential distribution and assignment methodology used for the subject site south of Louis St. Laurent Avenue.

A summary of the trip generation estimate used for the future townhouse development is provided in **Table 4-1**. The previous conceptual draft plan includes 63 2-storey townhouses and 30 3-storey townhouses at the time of this report. ITE Land Use Codes (LUC) 220 Multi-Family Low-Rise and 221 Multi-Family Mid-Rise were used from Trip Generation 10<sup>th</sup> Edition.

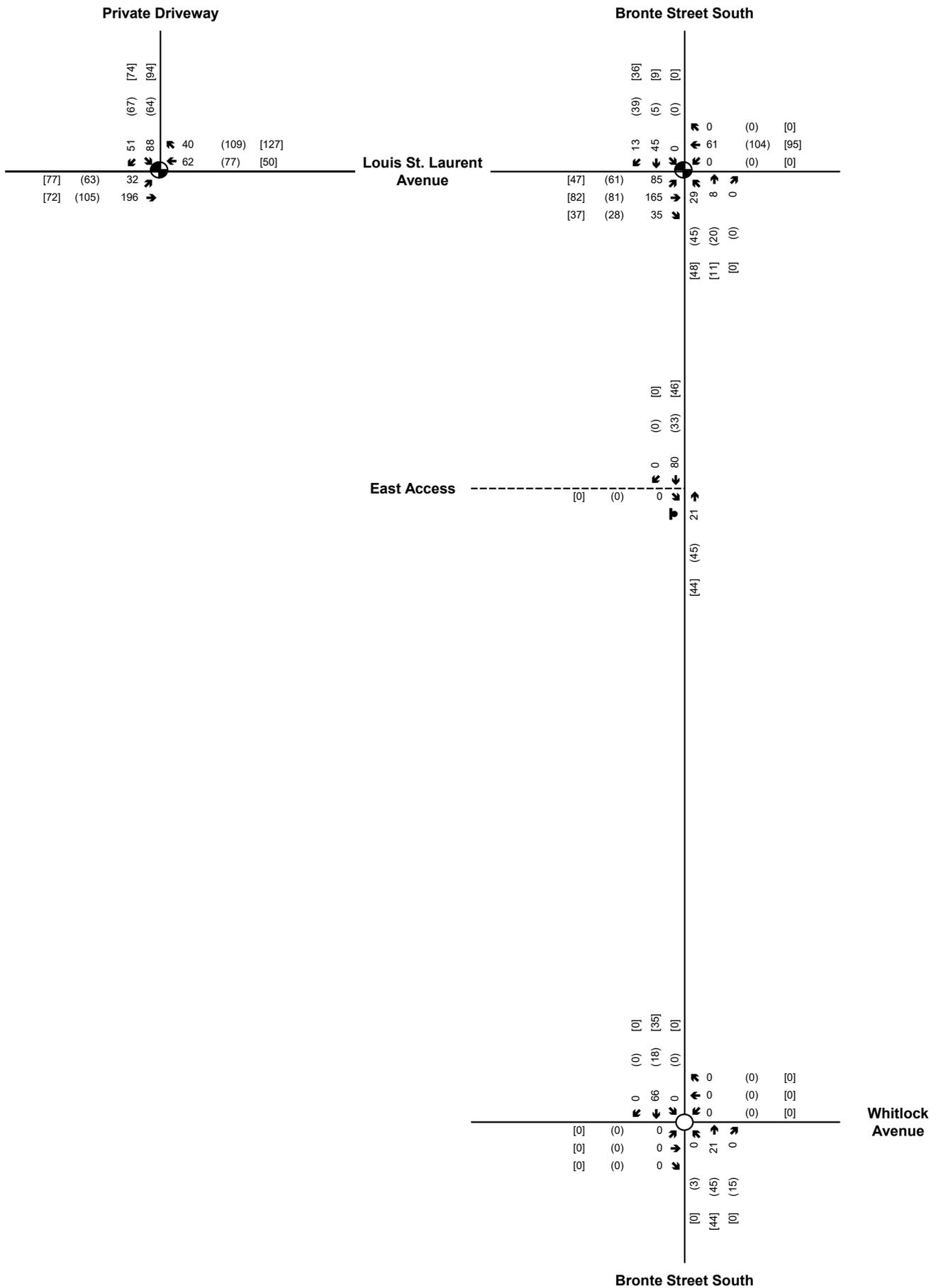
**Table 4-1 Residential Site Trip Generation**

Land Use	Parameter	Peak Hour Trip Generation								
		Weekday AM			Weekday PM			Saturday		
		In	Out	Total	In	Out	Total	In	Out	Total
Multifamily (Low-rise) LUC 220 63 Units	Equation / Rate	$\text{Ln}(T) = 0.95 \text{Ln}(X) - 0.51$			$\text{Ln}(T) = 0.89 \text{Ln}(X) - 0.02$			$T = 1.08(X) - 33.24$		
	Distribution	23%	77%	100%	63%	37%	100%	54%	46%	100%
	<b>Gross Trips</b>	<b>7</b>	<b>24</b>	<b>31</b>	<b>25</b>	<b>14</b>	<b>39</b>	<b>19</b>	<b>16</b>	<b>35</b>
Multifamily (Mid-rise) LUC 221 30 Units	Equation / Rate	$\text{Ln}(T) = 0.98 \text{Ln}(X) - 0.98$			$\text{Ln}(T) = 0.96 \text{Ln}(X) - 0.63$			0.44		
	Distribution	26%	74%	100%	61%	39%	100%	61%	39%	100%
	<b>Gross Trips</b>	<b>3</b>	<b>8</b>	<b>11</b>	<b>9</b>	<b>5</b>	<b>14</b>	<b>8</b>	<b>5</b>	<b>13</b>
<b>Total Site Trips</b>		<b>10</b>	<b>32</b>	<b>42</b>	<b>34</b>	<b>19</b>	<b>53</b>	<b>27</b>	<b>21</b>	<b>48</b>

*For residential land uses, the number of units per land use was used to calculate the estimated number of trips*

As summarized in **Table 4-1**, the proposed townhouse development is expected to generate a total of 42 new two-way vehicle trips during the weekday a.m. peak hour, consisting of 10 inbound and 32 outbound trips. During the p.m. peak hour, 53 new two-way trips consisting of 34 inbound and 19 outbound trips are expected. A total of 48 new two-way trips are expected to be generated during the Saturday peak hour, consisting of 27 inbound and 21 outbound trips.

A volume figure depicting the resulting site assignment for the townhouse development is provided in **Appendix F**. Of note, there are existing roads to the north of the townhouse site that provide access to Bronte Street South north of Louis St. Laurent Avenue. Accordingly, a portion of site traffic was assumed to use these connections outside of the immediate study area, resulting in the volume of site traffic entering and exiting from the main access to Louis St. Laurent Avenue to not equate to the total site trips summarized in **Table 4-1**.



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ⦿ Signalized Intersection
- Roundabout
- Stop Control

**Figure 4-2**  
**Total Background Development**  
**Traffic Volumes**

## 4.5 Boyne Survey Area

### 4.5.1 Existing Developments

Under 2032 future traffic conditions, it is assumed that the Boyne West Tertiary plan is built out. **Figure 4-3** below illustrates the Boyne RNA West Block road network. However, it is noted that under baseline (existing 2025) conditions, some of the residential development in the Boyne West Tertiary Plan is currently built and occupied, and is contributing to existing traffic volumes. To ensure that any double counting is removed from the total traffic volumes, the estimated low-density residential site trips generated by Boyne RNA traffic sub-zones 15-30 (25% of sub-zone 17, 100% of sub-zones 15, 16, 18-30 removed) was removed from the total Boyne RNA trips. Thus, the mixed-use developments from the Boyne West parcel (sub-zones 15-30) form part of the 2032 background traffic volumes.

**Figure 4-3 Boyne Survey West Tertiary Plan Excerpt (Zones 15-32)**



### 4.5.2 Future Background Developments

The subject site and the majority of the background developments form part of the Boyne West Tertiary Plan. Accordingly, site traffic attributable to these developments was removed from the overall Boyne RNA site traffic volumes so as not to double count background site traffic volumes. The District Park site traffic was accounted for as a part of the Boyne RNA study background volumes. Boyne RNA traffic sub-zones 1 to 10, 12, and 14 are comprised of the subject site and the background developments identified by the Town. Boyne RNA traffic sub-zones 1 to 10, 12, and 14 are illustrated in **Figure 4-4**, an excerpt of the Boyne Survey West Tertiary Plan presented in the Boyne RNA study.

**Figure 4-4 Boyne Survey West Tertiary Plan Excerpt**



It was assumed that 100% of the traffic volumes generated by Boyne RNA traffic sub-zones 1 to 10

would be replaced by the updated background development site traffic volumes. Traffic sub-zone 12 is representative of the Elsie MacGill Secondary School background development identified in **Section 4.4**. Since traffic sub-zone 12 is built out and in operation, the traffic volumes generated by sub-zone has been removed from the analysis as it would have been captured in the 2025 turning movement counts.

The currently proposed Draft Plan assumed that 100% of the traffic volumes generated by Boyne RNA traffic sub-zone 14 would be replaced by the updated subject site traffic volumes. The Boyne RNA traffic volumes associated with the District Park (sub-zone 14) were not updated. Traffic volume figures are provided in **Appendix G** that document the total site traffic volumes presented in the Boyne RNA study, site and background development traffic volumes that were removed to avoid double counting, and the resultant net trips attributable to other future Boyne developments.

The Boyne RNA study estimated site traffic for the Tertiary Plan Blocks by applying the following trip rates in Trip Generation, 8<sup>th</sup> Edition, published by the Institute of Transportation Engineers (ITE):

- ▶ High density residential; Land Use Code 230 Residential Condominium/Townhouse
- ▶ Retail Commercial; Land Use Code 820 Shopping Centre (ITE data indicates that community shopping centres with a GFA less than 120,000 ft<sup>2</sup> have an average ITE pass-by rate of 43% during the weekday pm hour.)
- ▶ Elementary School; Land Use Code 520 Elementary School
- ▶ High School; Land Use Code 530 High School
- ▶ District Park included a combination of following; Land Use Code 488 Soccer Complex, Land Use Code 495 Recreational Community Centre, Land Use Code 590 Library, Ice Pads (custom trip generation)

Site generated trips for the low and medium-density residential units were based on existing trip rates extracted from the Bristol Survey neighbourhood located adjacent to the Boyne survey, north of Louis St. Laurent Avenue.

The subject development makes up the entirety of Boyne RNA sub-zone 14, which the Boyne RNA assumed consisted of 470 high-density residential units and approximately 202,400 ft<sup>2</sup> GFA of retail/commercial uses. **Table 4-2** summarizes the total residential and non-residential trips estimated by the Boyne RNA in comparison to the updated subject site trip generation detailed in **Section 5** of this report.

**Table 4-2 Boyne RNA Sub-Zone Site-Related Trip Generation Comparison**

	Peak hour Trip Generation					
	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total

RNA Sub-Zone 14	161	245	406	387	326	713
Estimated Site Generated Trips	250	330	580	391	324	715
<b>Total Trip Difference</b>	<b>+89</b>	<b>+85</b>	<b>+174</b>	<b>+4</b>	<b>-2</b>	<b>+2</b>

As presented in the above table, the proposed site results in a net increase in projected trips when compared to the original Boyne RNA estimate, with the greater change during the a.m. peak hour. This is primarily associated with the supermarket use which acts as a significant trip generator during the a.m. peak hour when previously all the retail was assumed to be shopping centre for the purpose of trip generation, which does not generate as many trips during the a.m. peak hour.

## 4.6 Saturday Traffic Volume Conversion Factor

Saturday mid-day peak hour volumes were not generated for the Boyne RNA study and many of the background developments provided by the Town. To estimate the Saturday traffic volumes, a conversion factor was established using the existing turning movement counts conducted at the study area and neighbouring intersections during the Saturday mid-day peak hour were utilized in conjunction with counts from the p.m. peak hour.

Turning movements counts used in the Saturday conversion factor calculations were taken at the following intersections:

- ▶ Louis St. Laurent Avenue at Savoline Boulevard,
- ▶ Bronte Street at Whitlock Avenue and;
- ▶ Louis St. Laurent Avenue at Bronte Street

These intersections are located within, or immediately adjacent to subject area, and as there is existing commercial/ mixed-use within the area, both residential and non-residential trips are represented by the existing traffic patterns recorded at these intersections. Accordingly, the existing turning movement data from the weekday p.m. and mid-day Saturday peak hours were compared to develop a Saturday conversion factor.

The purpose of the conversion factor is to convert p.m. peak hour background traffic into corresponding Saturday background traffic. Accordingly, for background developments for which Saturday volumes were not provided to TYLin, the Saturday volumes within the future background analysis represent a percentage of the weekday p.m. peak hour volumes generated by those background developments.

As summarized in **Table 4-3**, it was determined that a conversion factor of 77% would be applied to the existing p.m. traffic volumes to estimate the existing Saturday traffic volumes for background

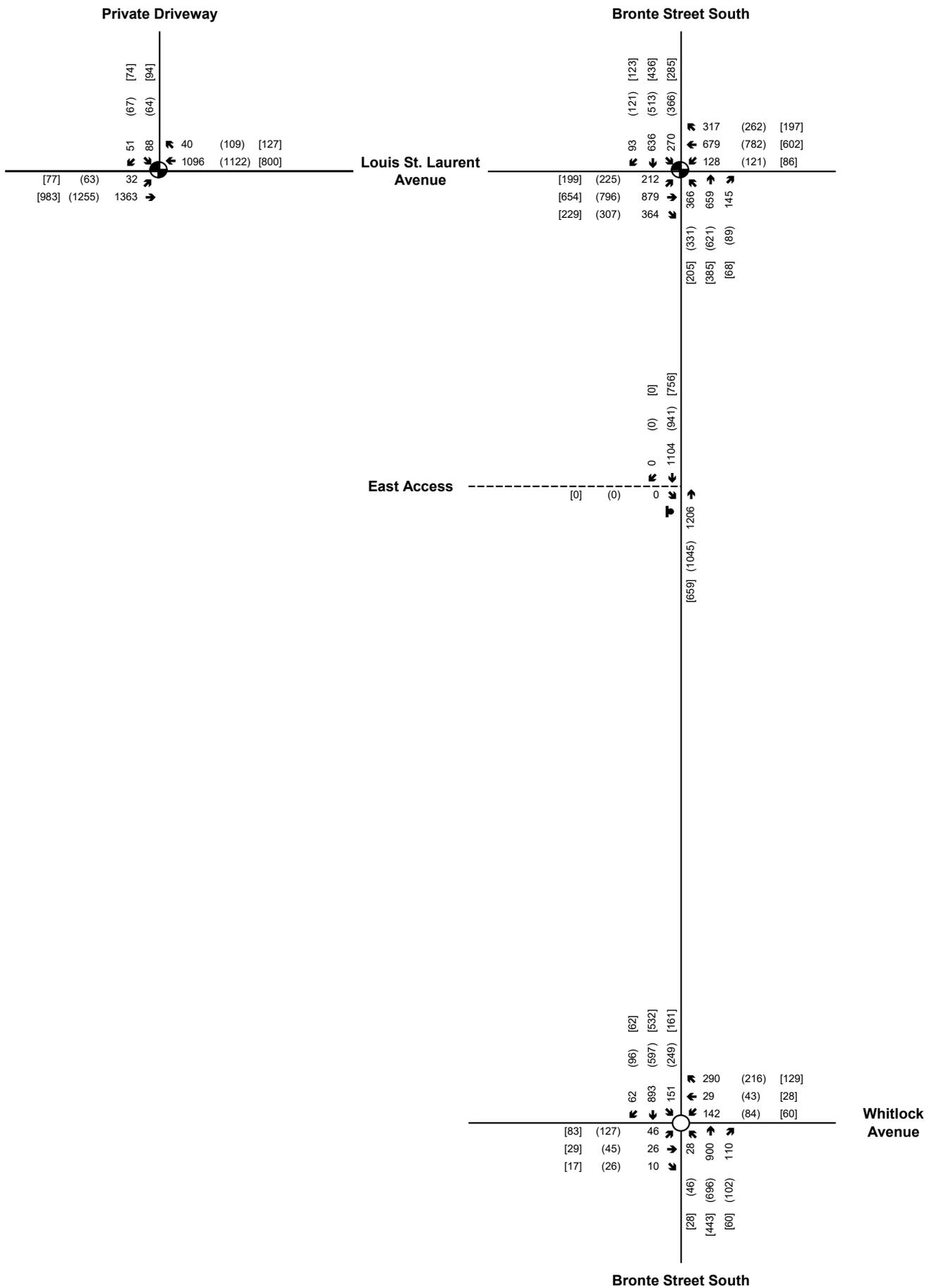
development traffic passing through study area intersections.

**Table 4-3 Saturday Volumes Conversion Factor from Existing Traffic Data**

Intersection	Movement of Interest	Traffic Volumes		Intersection Percentage Difference
		Weekday PM Peak Hour	Saturday Mid-day Peak Hour	
Louis St. Laurent Avenue & Savoline Boulevard (Signalized)	EBL	38	25	79%
	EBT	310	228	
	WBT	228	205	
	WBR	357	213	
	SBL	224	211	
	SBR	32	35	
Bronte Street & Whitlock Avenue (Roundabout)	WBL	21	19	72%
	WBR	120	66	
	NBT	431	261	
	NBR	20	16	
	SBL	112	72	
	SBR	302	294	
Louis St. Laurent Avenue & Bronte Street (Signalized)	EBL	137	111	80%
	EBT	302	252	
	EBR	100	76	
	WBL	61	47	
	WBT	351	271	
	WBR	122	106	
	NBL	151	71	
	NBT	375	230	
	NBR	28	28	
	SBL	143	141	
	SBT	262	248	
	SBR	63	70	
Overall Average Intersection Percentage Difference				77%

## 4.7 Background Traffic Volumes

**Figure 4-5** summarizes the future background 2032 traffic volumes during the weekday a.m., p.m., and Saturday mid-day peak hours.



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- Signalized Intersection
- Roundabout
- ⬇ Stop Control

**Figure 4-5**

**Future Background 2032 Traffic Volumes**

## 5 SITE GENERATED TRAFFIC

### 5.1 Site Trip Generation

As discussed in **Section 2.2**, the proposed development includes commercial and residential blocks. As noted above, the trips associated with the District Park are captured in the future background conditions to account for the uncertainty with the Town’s plans for the park. The following section summarizes the estimated site trips generated by all blocks for the weekday a.m., p.m., and Saturday mid-day peak hours. Site traffic was estimated by applying the trip rates found in *Trip Generation*, 10<sup>th</sup> Edition, published by the Institute of Transportation Engineers (ITE). Note that no transit mode split adjustment was applied to site trip generation.

### 5.1.1 Non-Residential Land Use Block

**Table 5-1** summarizes the estimated trip generation for the commercial blocks. As noted in **Section 4.5** in the Boyne RNA used the LUC 820 Shopping Centre to calculate the trip generation of commercial spaces. The current concept plan envisions a supermarket acting as the anchor tenant for the commercial blocks (Building A) and for the purpose of the trip generation for this study, the ITE LUC 850 Supermarket rate was used. To remain consistent with the Boyne RNA and to account for the uncertainty with the remaining tenants at the time of this study, the ITE LUC 820 Shopping Centre was used to generate the estimated number of trips. Pass-by rates, where applicable, were taken from Trip Generation Handbook 3<sup>rd</sup> Edition. For LUC 850, only a p.m. pass-by rate of 36% was applicable, as per the Trip Generation Handbook. For LUC 820, p.m. and Saturday pass-by rates of 34% and 26% were applicable, respectively. ITE Land Use information and pass-by rates have been provided in **Appendix H**.

**Table 5-1 Non-Residential Site Trip Generation**

Land Use	Parameter	Peak Hour Trip Generation								
		Weekday AM			Weekday PM			Saturday		
		In	Out	Total	In	Out	Total	In	Out	Total
<b>60,000 ft<sup>2</sup> GFA Supermarket LUC 850</b>	Equation / Rate	3.82			9.24			10.34		
	Distribution	60%	40%	100%	51%	49%	100%	51%	49%	100%
	Gross Primary Trips	137	92	229	283	271	554	316	304	620
	Internal Reduction	-1	-1	-2	-28	-46	-74	-43	-58	-101
	<b>Net Primary Trips</b>	<b>136</b>	<b>91</b>	<b>227</b>	<b>155</b>	<b>125</b>	<b>280</b>	<b>273</b>	<b>246</b>	<b>519</b>
	Pass-by Rate	0%			36%			0%		
	Pass-by Trips	0	0	0	100	100	200	0	0	0
<b>87,833 ft<sup>2</sup> GFA Shopping Centres LUC 820</b>	Equation / Rate	0.94			$\text{Ln}(T) = 0.74 \text{Ln}(X) + 2.89$			$\text{Ln}(T) = 0.79 \text{Ln}(X) + 2.79$		
	Distribution	62%	38%	100%	48%	52%	100%	52%	48%	100%
	Gross Primary Trips	51	32	83	237	257	494	291	268	559
	Internal Reduction	-1	0	-1	-23	-44	-67	-40	-52	-92
	<b>Net Primary Trips</b>	<b>50</b>	<b>32</b>	<b>82</b>	<b>130</b>	<b>129</b>	<b>259</b>	<b>178</b>	<b>143</b>	<b>321</b>
	Pass-by Rate	0%			34%			26%		
	Pass-by Trips	0	0	0	84	84	168	73	73	146
<b>Net Total Site Primary Trips</b>		<b>186</b>	<b>123</b>	<b>309</b>	<b>285</b>	<b>254</b>	<b>539</b>	<b>451</b>	<b>389</b>	<b>840</b>

Land Use	Parameter	Peak Hour Trip Generation								
		Weekday AM			Weekday PM			Saturday		
		In	Out	Total	In	Out	Total	In	Out	Total
<b>Net Total Site Pass-by Trips</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>184</b>	<b>184</b>	<b>368</b>	<b>73</b>	<b>73</b>	<b>146</b>

For non-residential land uses, the GFA / 1000 ft<sup>2</sup> was used to calculate the estimated number of trips

As summarized in **Table 5-1**, the proposed commercial blocks are expected to generate a total of 309 new two-way primary vehicle trips during the weekday a.m. peak hour, consisting of 186 inbound and 123 outbound trips. During the p.m. peak hour, it is expected to generate 539 new two-way primary trips consisting of 285 inbound and 254 outbound trips. A total of 840 new two-way primary trips are expected to be generated during the Saturday peak hour, consisting of 451 inbound and 389 outbound trips.

### 5.1.2 Residential Land Use Blocks

**Table 5-2** summarizes the estimated trip generation for the residential blocks. ITE Land Use Codes (LUC) 220 Multi-Family Low-Rise and 222 Multi-Family High-Rise were used from Trip Generation 10<sup>th</sup> Edition.

**Table 5-2 Residential Site Trip Generation**

Land Use	Parameter	Peak Hour Trip Generation								
		Weekday AM			Weekday PM			Saturday		
		In	Out	Total	In	Out	Total	In	Out	Total
Multifamily (Low-rise) LUC 220 277 Units	Equation / Rate	$\text{Ln}(T) = 0.95 \text{Ln}(X) - 0.51$			$\text{Ln}(T) = 0.89 \text{Ln}(X) - 0.02$			$T = 1.08(X) - 33.24$		
	Distribution	23%	77%	100%	63%	37%	100%	54%	46%	100%
	Gross Trips	29	97	126	92	54	146	144	122	266
	Internal Reduction	0	-1	-1	-42	-23	-65	-66	-51	-117
	<b>Net Trips</b>	<b>29</b>	<b>96</b>	<b>125</b>	<b>50</b>	<b>31</b>	<b>81</b>	<b>78</b>	<b>71</b>	<b>149</b>
Multifamily (High-rise) LUC 222 477 Units	Equation / Rate	0.31			0.36			$T = 0.31(X) + 24.03$		
	Distribution	24%	76%	100%	61%	39%	100%	55%	45%	100%
	Gross Trips	36	112	148	105	67	172	95	77	172
	Internal Reduction	-1	-1	-2	-49	-28	-77	-44	-33	-77
	<b>Net Trips</b>	<b>35</b>	<b>111</b>	<b>146</b>	<b>56</b>	<b>39</b>	<b>95</b>	<b>51</b>	<b>44</b>	<b>95</b>
<b>Net Total Site Trips</b>		<b>64</b>	<b>207</b>	<b>271</b>	<b>106</b>	<b>70</b>	<b>176</b>	<b>129</b>	<b>115</b>	<b>244</b>

For residential land uses, the number of units per land use was used to calculate the estimated number of trips

As summarized in **Table 5-2**, the proposed residential blocks are expected to generate a total of

271 new two-way vehicle trips during the weekday a.m. peak hour, consisting of 64 inbound and 207 outbound trips. During the p.m. peak hour, they are expected to generate 176 new two-way trips consisting of 106 inbound and 70 outbound trips. A total of 244 new two-way trips are expected to be generated during the Saturday peak hour, consisting of 129 inbound and 115 outbound trips. The trips generated for Saturday represent a conservative estimate as each of the uses had their trips generated independently at the “peak hour of generation” and the peak hours do not necessarily align with the two retail uses.

## 5.2 Site Trip Distribution and Assignment

As the subject lands include residential and non-residential developments, the site trip distribution was applied differently between the residential and non-residential blocks. **Table 5-3** provides a summary of the non-residential site trip distribution and **Table 5-4** provides a summary of the residential site trip distribution. For the residential development, the distribution is based on the 2016 Transportation Tomorrow Survey (TTS) data. For the non-residential development, the distribution was assumed to be 25% in each direction to capture the origin and destination patterns of existing and future residents surrounding the subject area based on engineering judgement. Of note, although vehicles may be ultimately bound to the north or south, they may have been assigned to an east-west road to later continue north-south based on road network restrictions. This is consistent with the previous traffic study reviewed by the Town and Region. **Appendix I** provides a detailed trip distribution summary that includes figures for both residential and non-residential uses.

**Table 5-3 Non-Residential Site Trip Distribution**

Trip Orientation (To / From)		Non-Residential Site Trip Distribution					
		AM		PM		Saturday	
		In	Out	In	Out	In	Out
North	Tremaine Road via Louis St. Laurent Avenue	5%	5%	5%	5%	5%	5%
	Bronte Street South	10%	10%	10%	10%	10%	10%
	Savoline Boulevard via Louis St. Laurent Avenue	5%	5%	5%	5%	5%	5%
	Thompson Road via Louis St. Laurent Avenue	5%	5%	5%	5%	5%	5%
South	Bronte Street South	25%	25%	25%	25%	25%	25%
East	Louis St. Laurent Avenue	5%	5%	5%	5%	5%	5%

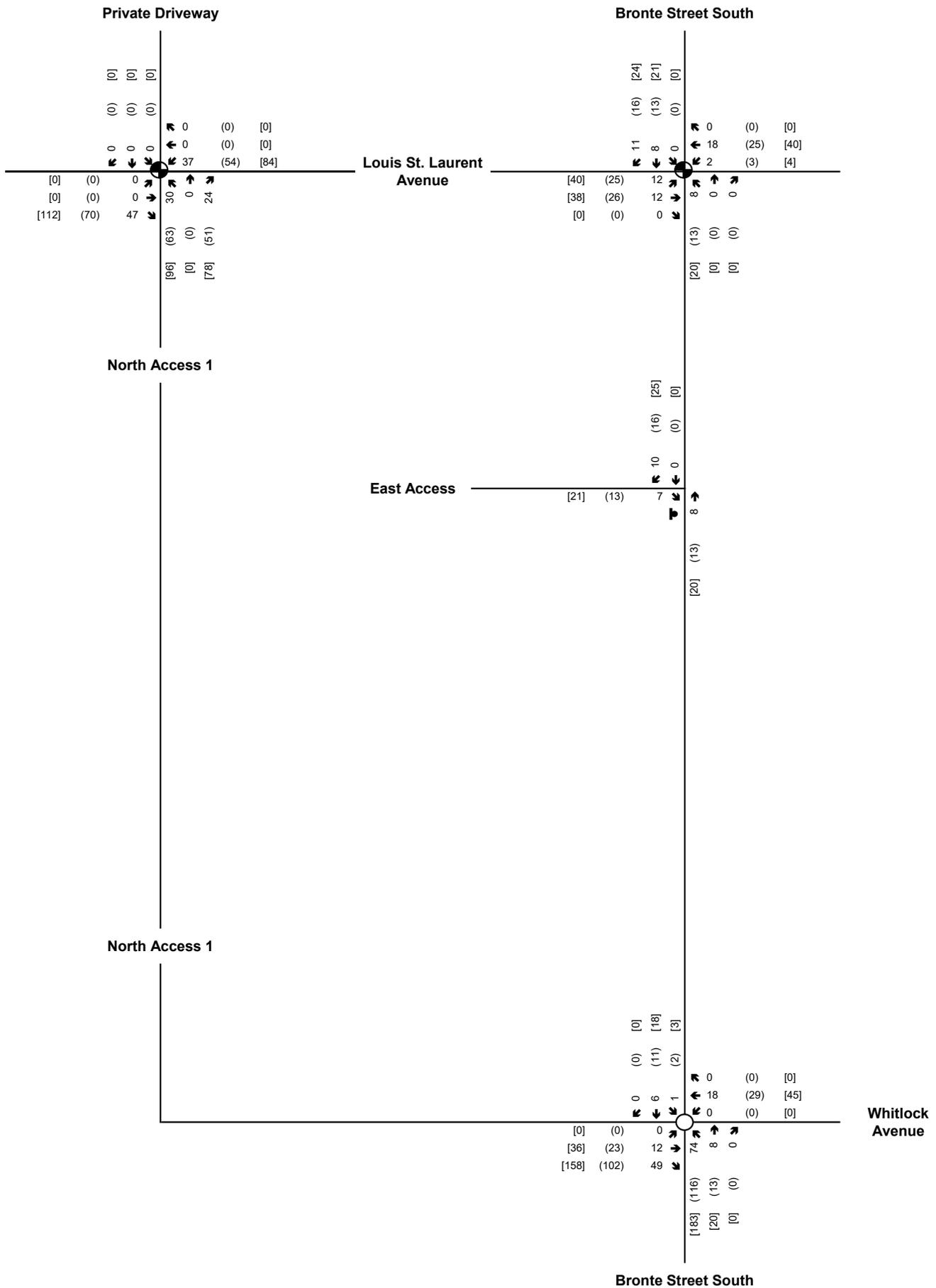
	Whitlock Avenue	10%	10%	10%	10%	10%	10%
	Britannia Road via Bronte Street South	10%	10%	10%	10%	10%	10%
West	Louis St. Laurent Avenue	15%	15%	15%	15%	15%	15%
	Britannia Road via Bronte Street South	10%	10%	10%	10%	10%	10%
<b>Total</b>	-	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Table 5-4 Residential Site Trip Distribution**

Trip Orientation (To / From)		Residential Site Trip Distribution					
		AM		PM		Saturday	
		In	Out	In	Out	In	Out
North	Tremaine Road via Louis St. Laurent Avenue	14%	36%	39%	22%	39%	22%
	Bronte Street South	17%	14%	14%	28%	14%	28%
	Savoline Boulevard via Louis St. Laurent Avenue	7%	1%	1%	2%	1%	2%
South	Bronte Street South	24%	33%	33%	28%	33%	28%
East	Louis St. Laurent Avenue	28%	11%	8%	15%	8%	15%
	Whitlock Avenue	10%	5%	5%	5%	5%	5%
West	N/A	0%	0%	0%	0%	0%	0%
<b>Total</b>	-	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Figure 5-1, Figure 5-2, and Figure 5-3** summarize the primary, pass-by and net non-residential site trip traffic volumes, respectively, for the weekday a.m., p.m., and Saturday peak hours.

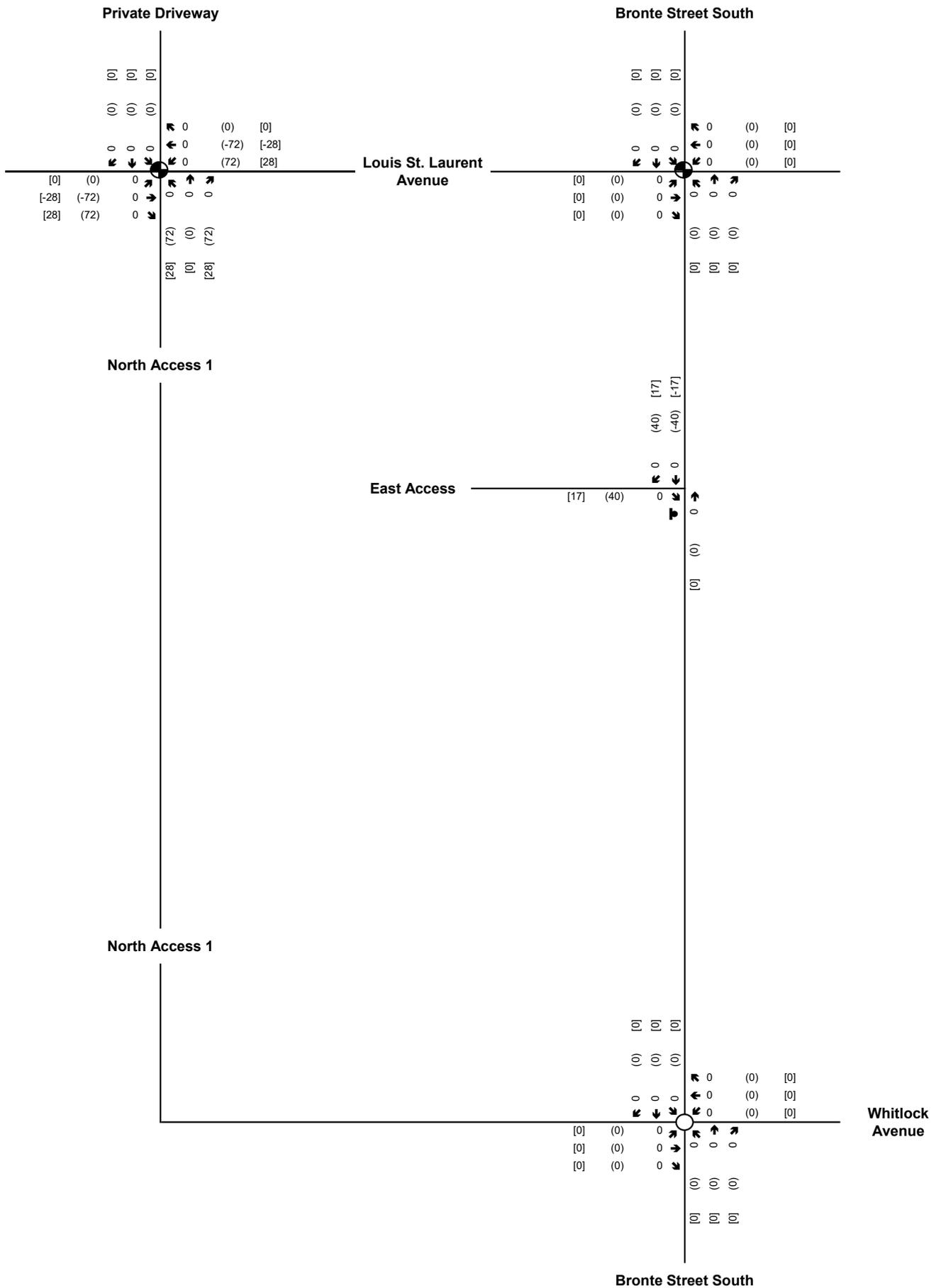
**Figure 5-4** summarizes the residential site traffic volumes for all peak hours. **Figure 5-5** summarizes the combined non-residential and residential net total site trip traffic volumes during the weekday a.m., p.m., and Saturday mid-day peak hours.



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- Signalized Intersection
- Roundabout
- ⬇ Stop Control

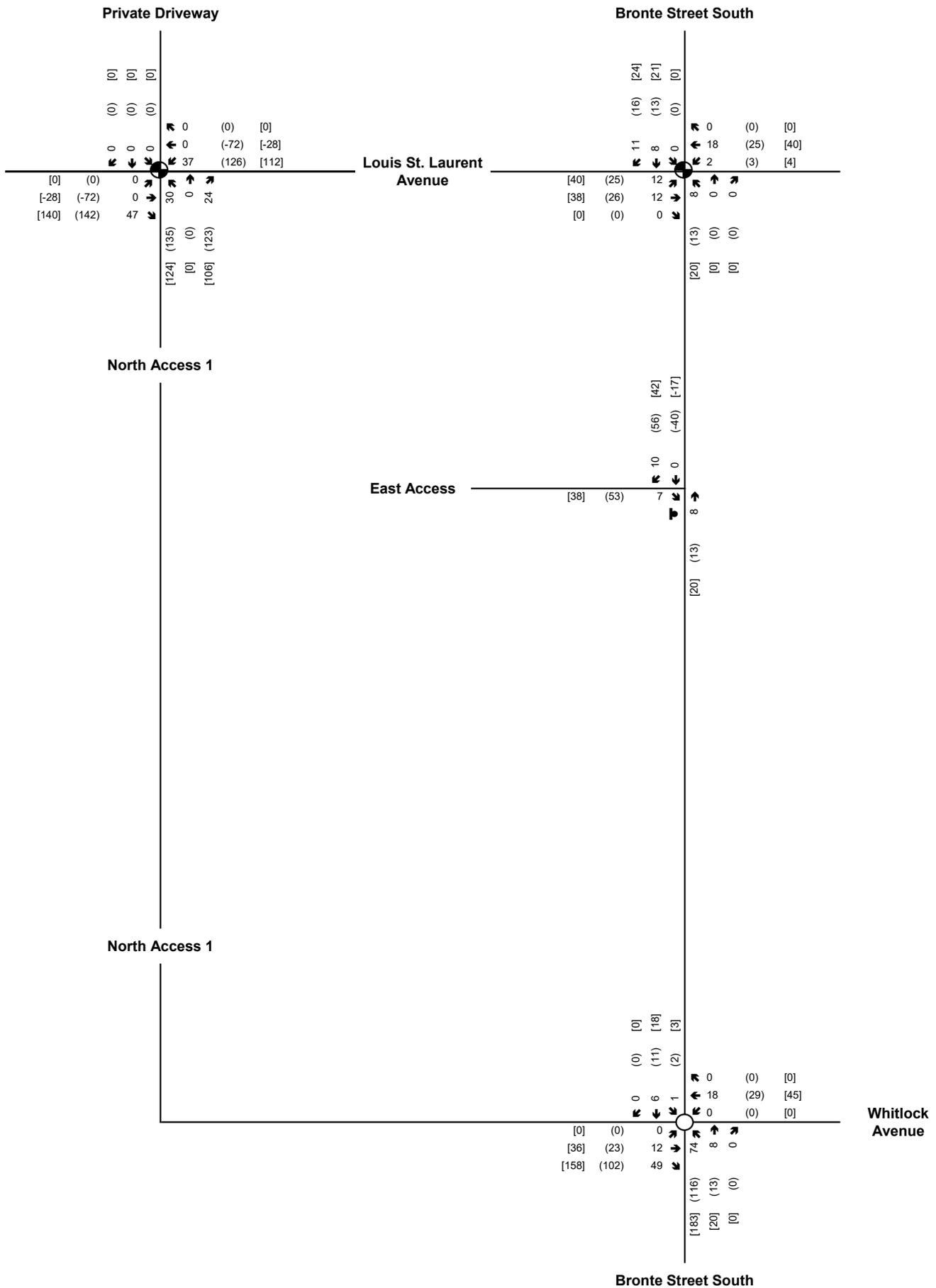
**Figure 5-1**  
**Non-Residential Primary Site**  
**Traffic Volumes**



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- Signalized Intersection
- Roundabout
- ⬇ Stop Control

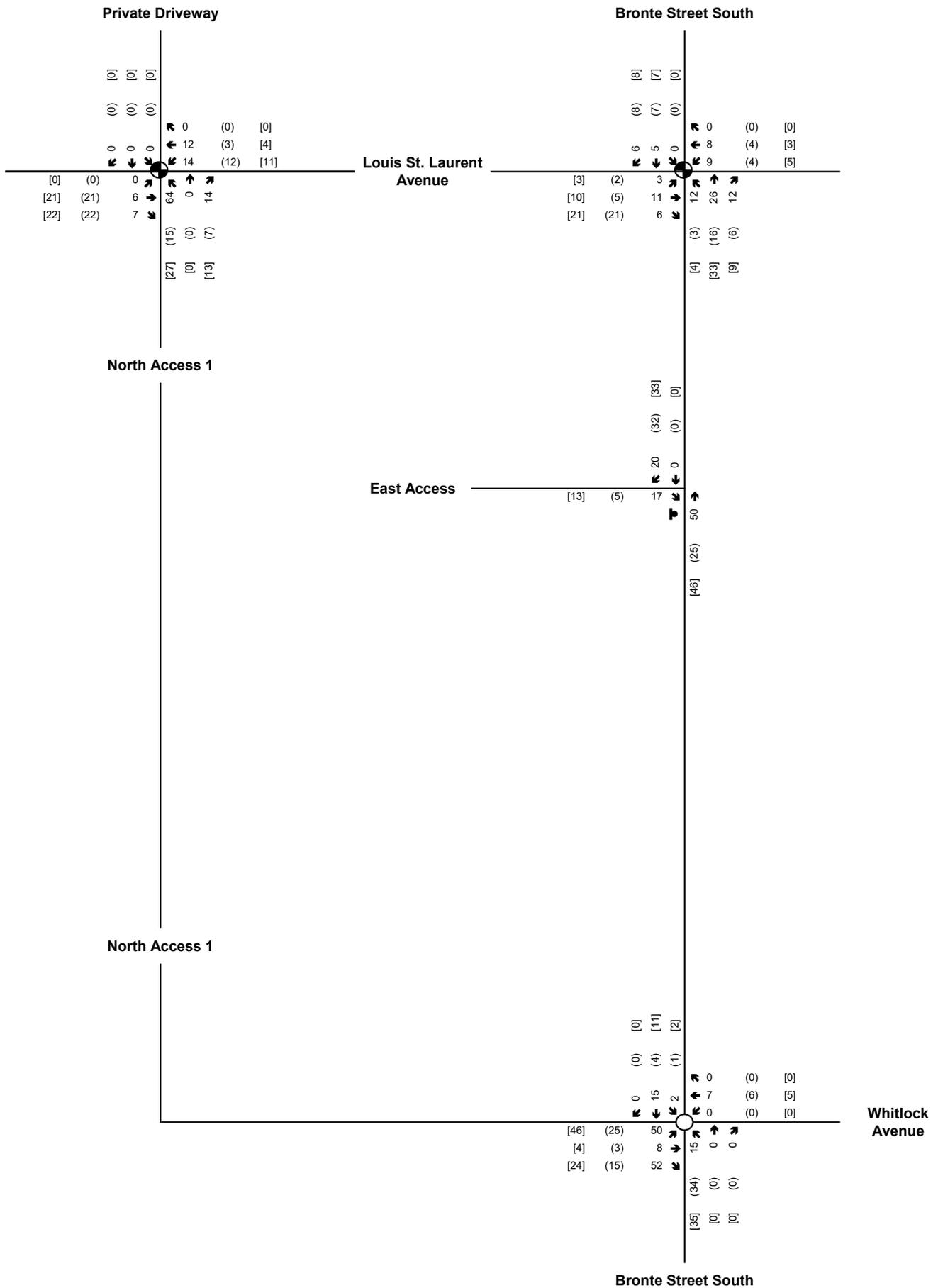
**Figure 5-2**  
**Non-Residential Pass-by Site**  
**Traffic Volumes**



**LEGEND**

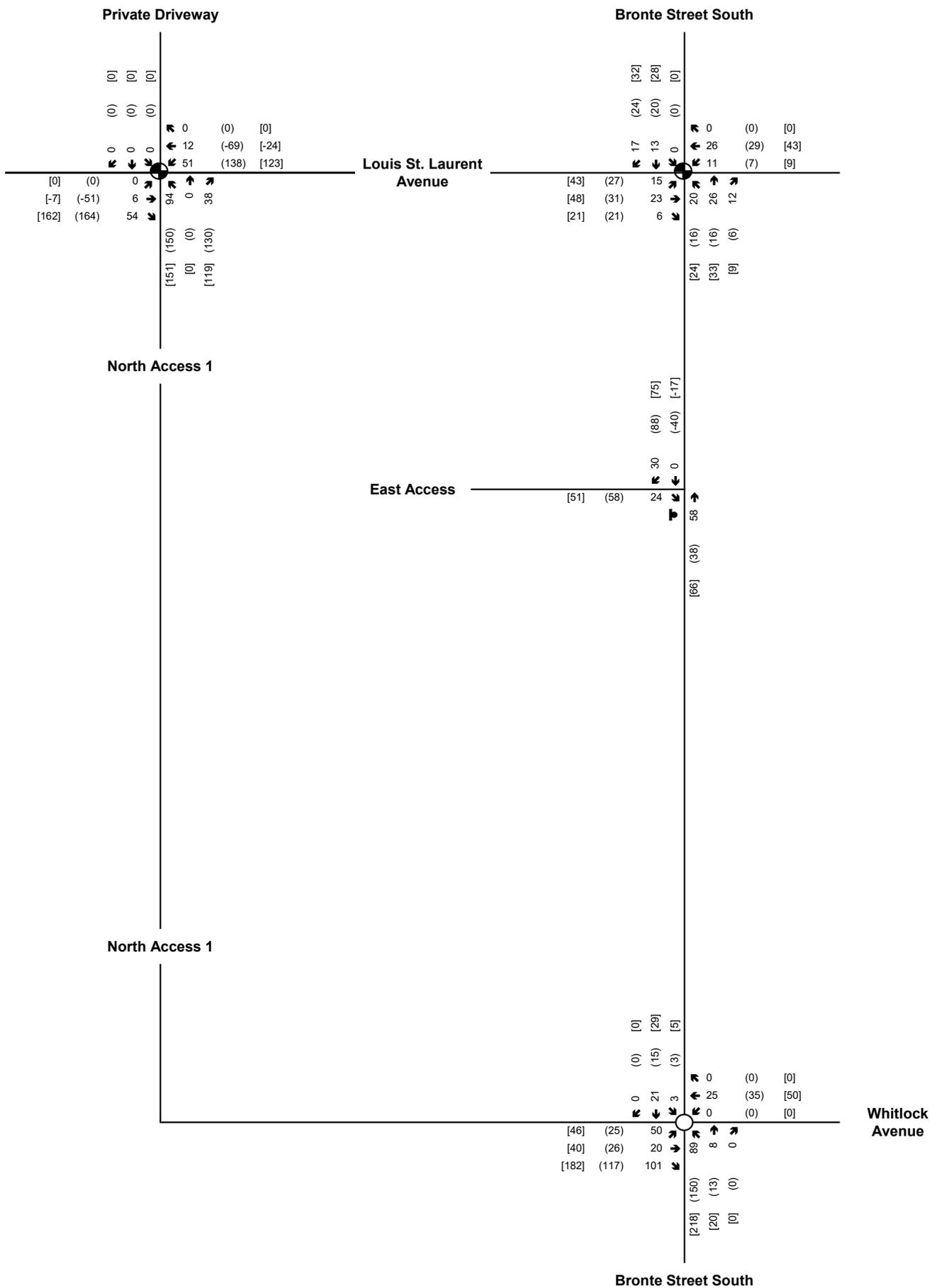
- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ⊙ Signalized Intersection
- Roundabout
- ⬇ Stop Control

**Figure 5-3**  
**Non-Residential Net Site**  
**Traffic Volumes**



**Figure 5-4**

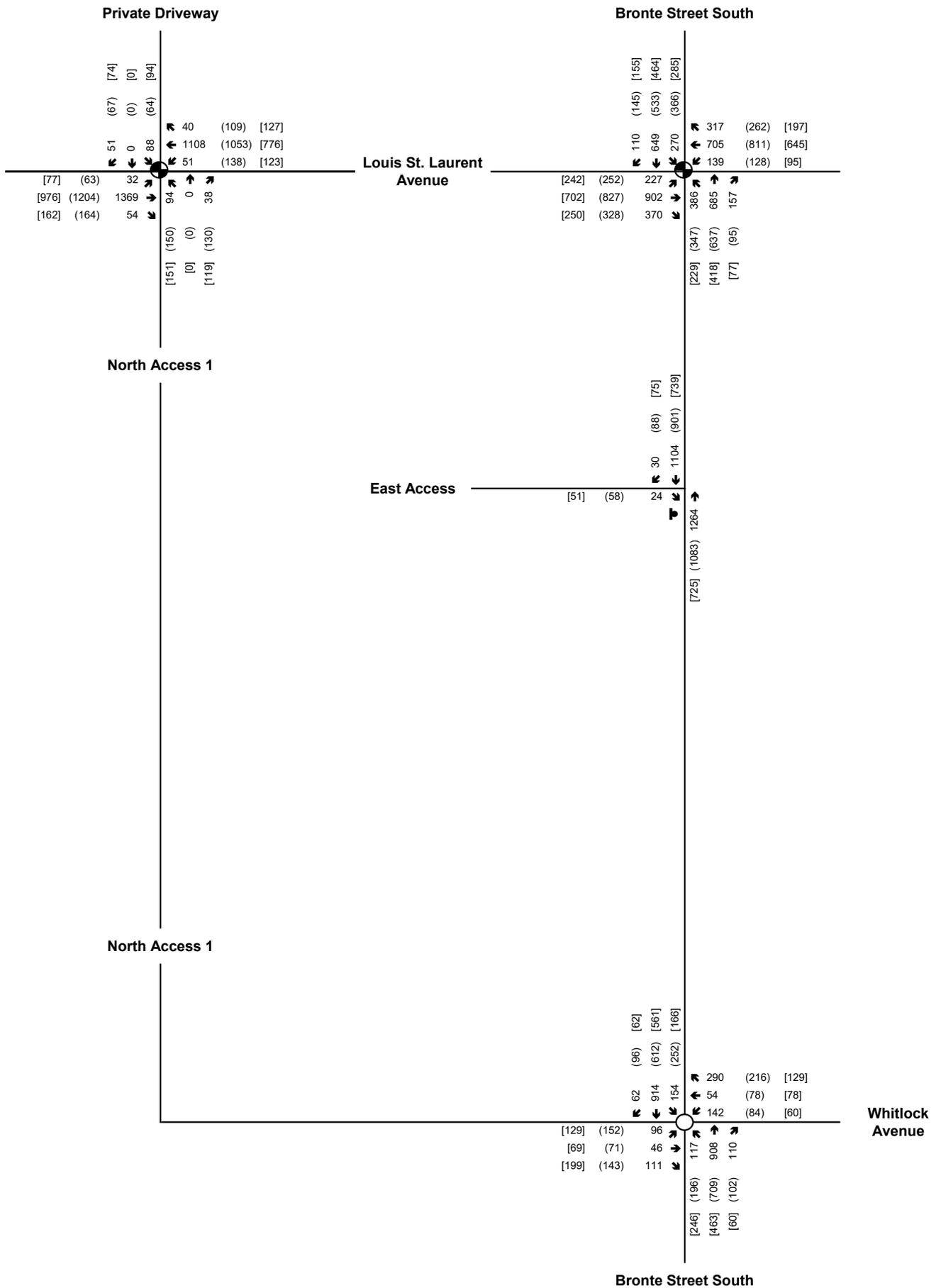
**Residential Site Traffic Volumes**



**Figure 5-5**  
**Combined Net Total Site**  
**Traffic Volumes**

## 6 TOTAL TRAFFIC VOLUMES

**Figure 6-1** summarizes the future total 2032 traffic volumes during the weekday a.m., p.m. and Saturday mid-day peak hours.



**Figure 6-1**

**Future Total 2032 Traffic Volumes**

## 7 LANE CONFIGURATIONS

### 7.1 Boyne RNA Study Lane Improvements

The Boyne RNA proposed several turning lanes at the intersection of Bronte Street South and Louis St. Laurent Avenue, and they are as follows:

- ▶ Eastbound right-turn lane with a minimum storage length of 26 metres, (rounded to 30 metres)
- ▶ Westbound right-turn lane with a minimum storage length of 30 metres
- ▶ Northbound right-turn lane with a minimum storage length of 50 metres

Supporting excerpts from the Boyne RNA Study can be found in **Appendix J**. These improvements were included in the future background conditions and carried forward for the future total conditions.

### 7.2 Local Lane Improvements

Based on the queuing analysis presented in **Section 10** in the future background horizon there is a benefit to providing a southbound right-turn lane at Bronte Street South and Louis St. Laurent Avenue based on the projected traffic. For the purpose of the analysis, the same geometry as the northbound right-turn lane was maintained, with 50 metres of storage proposed. It is also noted that the consistency of including exclusive right-turn lanes would improve motorist's understanding of the intersection as well as the overall alignment and geometry of the intersection.

This improvement reduces the potential queues of the north leg of the intersection that are present in the future background conditions independent of the current Draft Plan. The need for this improvement is primarily driven by the significant pedestrian traffic observed in the 2019 counts collected for this study that were not included in the Boyne RNA. Based on the uncertainty with the project volumes, it is recommended that this movement be monitored to determine if they right-turn lane is ultimately required based on the actual traffic and pedestrian demand.

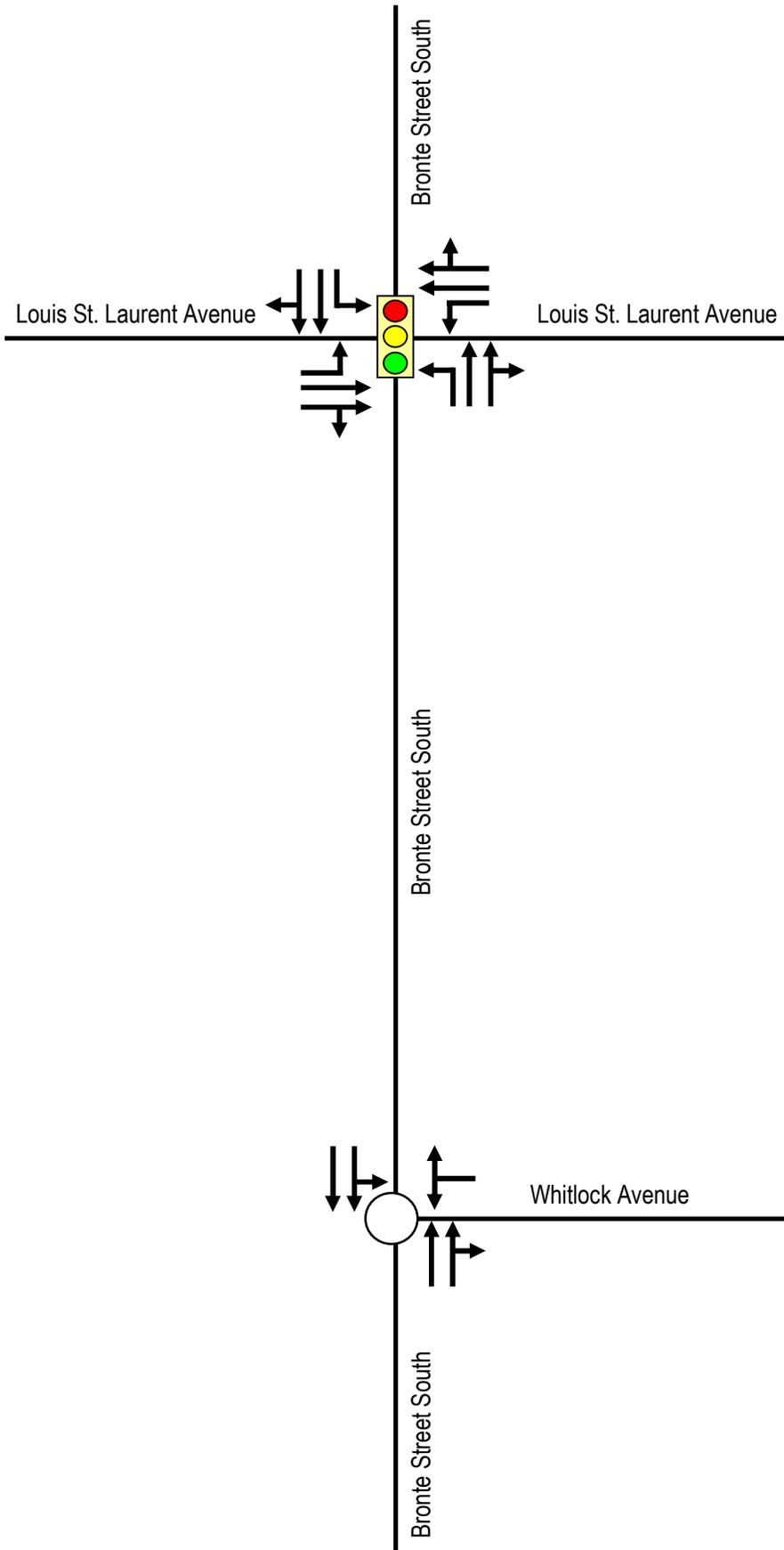
For the purpose of the analysis, this lane was included in the future background conditions and carried forward for the future total conditions.

### 7.3 Site Access Lane Configurations

For the north site access with Louis St. Laurent Avenue the intersection curbs and turning lanes are already constructed in the existing conditions, with only the north and south legs not open. There is a westbound left-turn lane, and the north and south accesses both consist of a left-turn lane and

shared through-right lane as per their associated plans. The site access that will be the west leg of Whitlock Avenue roundabout at Bronte Street South is proposed to mirror the east leg of the approach, with one inbound lane.

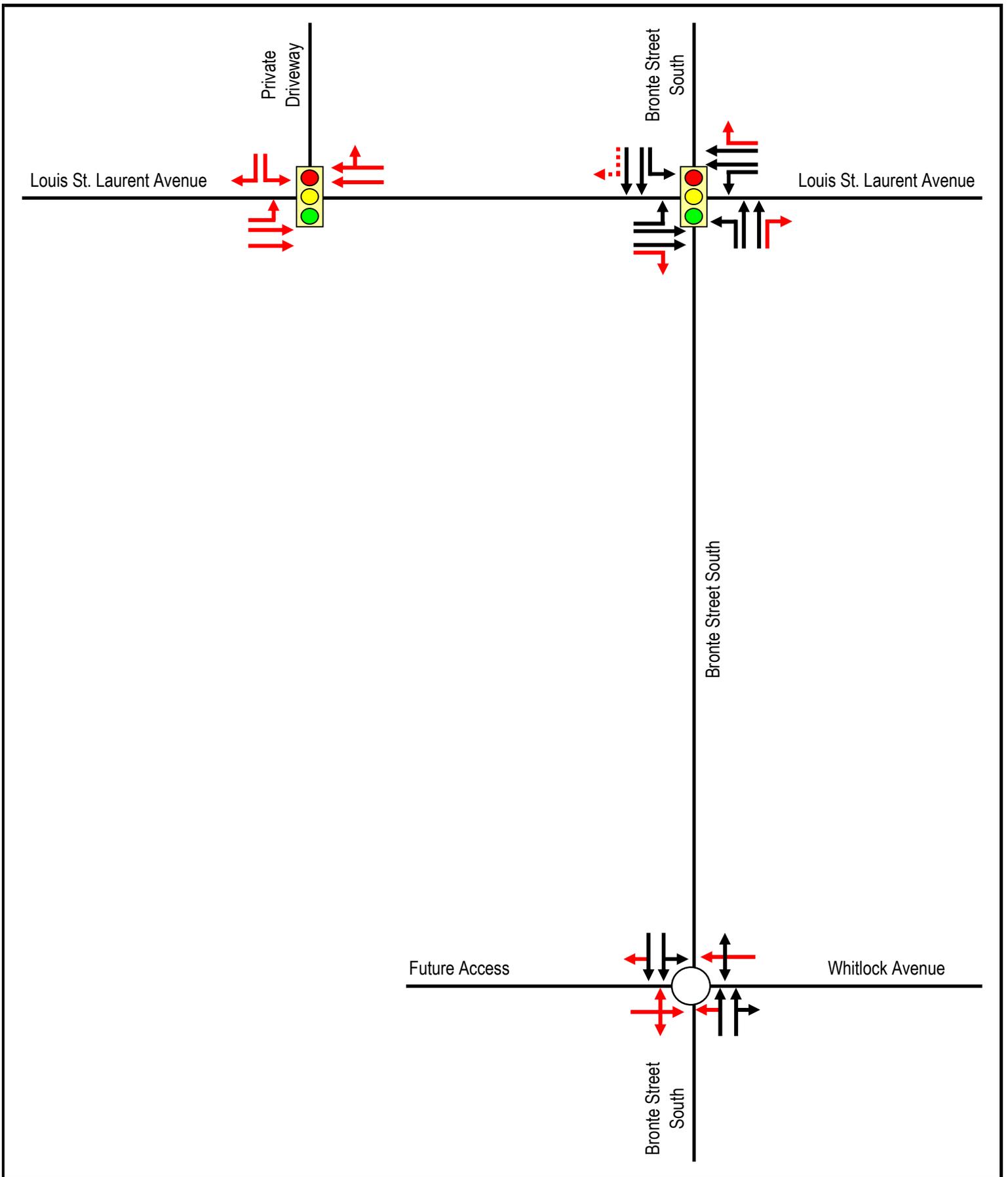
**Figure 7-1, Figure 7-2, and Figure 7-3** illustrate the baseline, future background 2032, and future total 2032 lane configurations, respectively. Note that lane improvements that have been triggered and incorporated under future background conditions are indicated by red arrows in **Figure 7-2**. Under future total conditions, these improvements outlined in future background conditions have been accounted for and have changed to black arrows. In **Figure 7-3**, the red arrows under future total conditions indicate the addition of the site accesses along Louis St. Laurent Avenue and Bronte Street South.

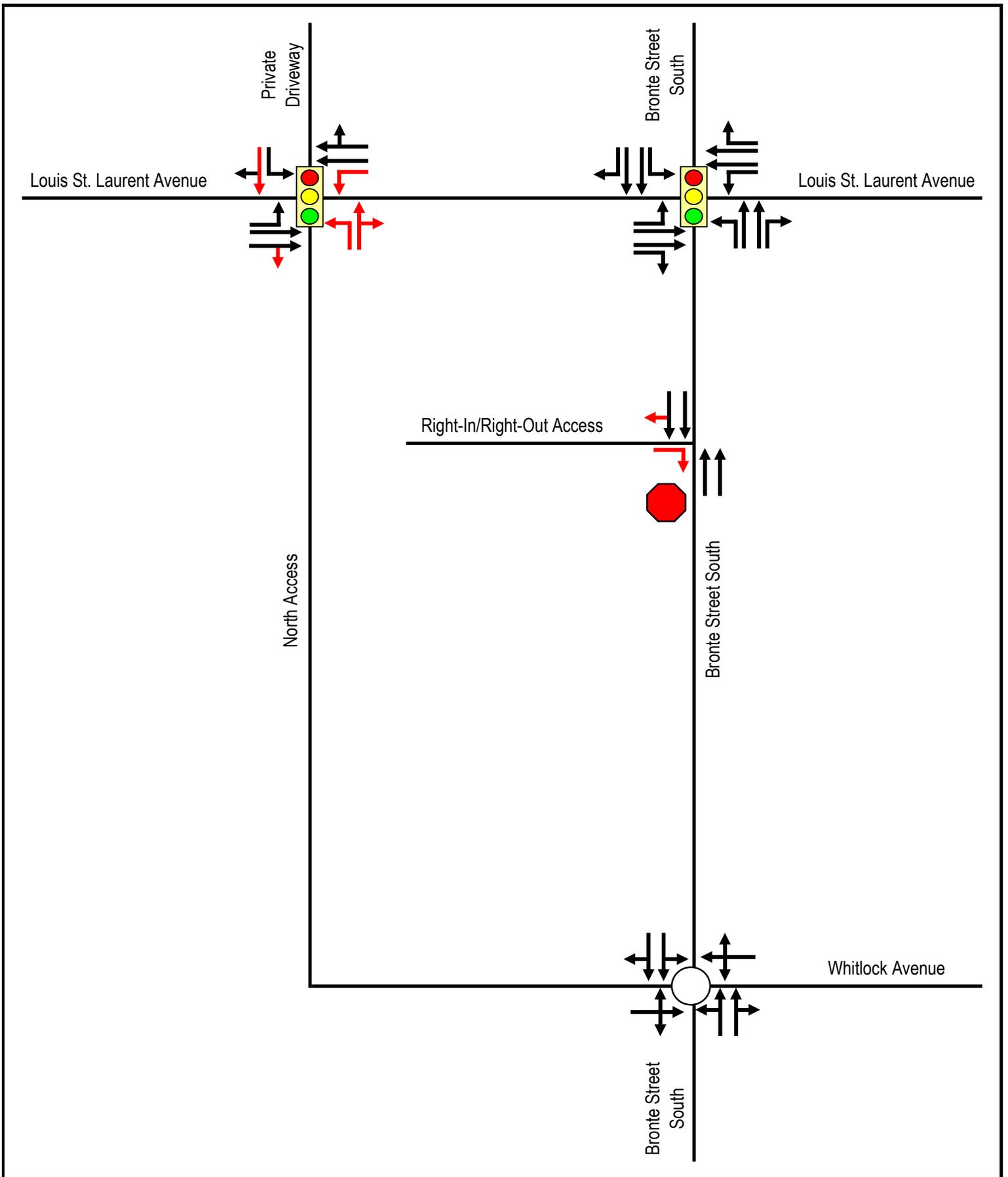


**Legend**

-  Signalized Intersection
-  Unsignalized Intersection
-  Roundabout Intersection
-  Planned Lane Improvement
-  Recommended Lane Improvement

**Figure 7-1**  
**Baseline (2025)**  
**Lane Configurations**





**Legend**

-  Signalized Intersection
-  Unsignalized Intersection
-  Roundabout Intersection
-  Planned Lane Improvement
-  Recommended Lane Improvement

**Figure 7-3**

**Future Total 2032 Lane Configurations**

## 8 TRAFFIC CAPACITY ANALYSIS

The capacity analysis identifies how well the intersections and access driveways are operating and how they are expected to operate in the future. The analysis contained in this report utilized the Highway Capacity Manual (HCM) 2000 techniques within the Synchro Version 10 Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement.

The analysis includes identification of all intersections and for all movements; v/c ratios, LOS indicators and 95<sup>th</sup> percentile queue lengths. ‘Critical’ intersections and movements, as defined by Halton Region, include:

### Signalized Intersections

- ▶ v/c ratios for overall intersection operations, through movements, or shared through/turning movements increased to 0.85 or above;
- ▶ v/c ratios for exclusive movements increased to 0.95 or above; or
- ▶ queues for an individual movement are projected to exceed available turning lane storage.

### Unsignalized Intersections

- ▶ LOS, based on average delay per vehicle, on individual movements exceeds LOS ‘D’; or
- ▶ The estimated 95<sup>th</sup> percentile queue length for an individual movement exceeds the available queue storage.

The following tables summarize the capacity analysis results for the study intersections during the weekday a.m. and p.m. peak hours under baseline (2025), future background (2032) and future total (2032) traffic conditions. Detailed Synchro reports are attached in **Appendix K**.

### 8.1 Baseline Conditions

**Table 8-1** summarizes the baseline capacity analysis results for the weekday a.m., p.m., and Saturday peak hours.

**Table 8-1 2025 Existing Capacity Analysis**

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Bronte	Overall	0.57	21	C	0.40	20	C	0.29	18	B

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Street South & Louis St. Laurent Avenue	EBL	0.19	12	B	0.25	8	A	0.17	6	A
	EBTR	0.37	13	B	0.18	7	A	0.14	6	A
	WBL	0.30	14	B	0.10	7	A	0.07	5	A
	WBTR	0.20	11	B	0.22	7	A	0.16	6	A
	NBL	0.88	<b>52</b>	<b>D</b>	0.71	<b>42</b>	<b>D</b>	0.38	32	C
	NBTR	0.41	22	C	0.46	30	C	0.33	31	C
	SBL	0.80	<b>43</b>	<b>D</b>	0.79	<b>52</b>	<b>D</b>	0.64	<b>39</b>	<b>D</b>
	SBTR	0.38	21	C	0.35	29	C	0.38	31	C

As seen in **Table 8-1**, under baseline conditions, all individual movements operate with reserve capacity and low delays. With the exception of the northbound left movement and southbound left movement, all movements have an LOS 'C' or better. The northbound left movement has a v/c ratio of 0.88 and a delay of 52 seconds during the a.m. peak hour; this is due to the high northbound left turning volumes under baseline conditions. Similarly, the southbound left movement has a v/c ratio of 0.80 and a delay of 43 seconds during the a.m. peak hour which is primarily due to the high southbound left turning volumes.

## 8.2 Future Background 2032 Conditions

### 8.2.1 Scenario 1: Future Background with No Optimizations

**Table 8-2** summarizes the future background 2032 capacity analysis results for the weekday a.m., p.m., and Saturday peak hours under Scenario 1.

**Table 8-2 Future Background 2032 Capacity Analysis Summary – Scenario 1**

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Bronte Street South & Louis St. Laurent Avenue	<i>Overall</i>	<b>1.72</b>	<b>88</b>	<b>F</b>	<b>1.77</b>	<b>83</b>	<b>F</b>	<b>0.90</b>	25	C
	EBL	<b>1.77</b>	<b>401</b>	<b>F</b>	<b>1.95</b>	<b>482</b>	<b>F</b>	0.87	55	D
	EBTR	0.84	27	C	0.72	24	C	0.53	18	B
	WBL	<b>1.61</b>	<b>346</b>	<b>F</b>	<b>1.22</b>	<b>186</b>	<b>F</b>	0.44	23	C
	WBTR	0.68	22	C	0.68	23	C	0.48	17	B
	NBL	<b>1.70</b>	<b>356</b>	<b>F</b>	<b>1.24</b>	<b>161</b>	<b>F</b>	0.76	35	D
	NBTR	0.55	19	B	0.46	18	B	0.32	19	B

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	SBL	<b>1.49</b>	<b>273</b>	<b>F</b>	<b>1.61</b>	<b>321</b>	<b>F</b>	0.93	58	E
	SBTR	0.49	18	B	0.41	18	B	0.39	19	B
Louis St. Laurent Avenue & Private Access	<i>Overall</i>	<i>0.51</i>	<i>7</i>	<i>A</i>	<i>0.46</i>	<i>6</i>	<i>A</i>	<i>0.39</i>	<i>7</i>	<i>A</i>
	EBL	0.11	3	A	0.24	5	A	0.21	4	A
	EBT	0.51	5	A	0.47	4	A	0.37	4	A
	WBTR	0.43	4	A	0.46	3	A	0.36	3	A
	SBL	0.52	54	D	0.42	53	D	0.54	54	D
	SBR	0.03	49	D	0.05	50	D	0.05	48	D

As seen in **Table 8-2**, under future background 2032 conditions Scenario 1, several movements at Bronte Street South and Louis St. Laurent Avenue operate above capacity with very high delays. It can be concluded that network and signal timing improvements are triggered under future background conditions. These operations are expected improve in operations with the aforementioned modifications to the intersection.

### 8.2.2 Scenario 2: Future Background with Network Improvements

**Table 8-3** summarizes the future background 2032 capacity analysis results for the weekday a.m., p.m., and Saturday peak hours under Scenario 2.

**Table 8-3 Future Background 2032 Capacity Analysis Summary – Scenario 2**

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Bronte Street South & Louis St. Laurent Avenue	<i>Overall</i>	<b>0.86</b>	<i>41</i>	<i>D</i>	<i>0.84</i>	<i>40</i>	<i>D</i>	<i>0.61</i>	<i>31</i>	<i>C</i>
	EBL	0.73	33	C	0.76	38	D	0.47	14	B
	EBT	0.75	36	D	0.62	31	C	0.42	21	C
	EBR	0.55	31	C	0.41	26	C	0.23	16	B
	WBL	0.63	32	C	0.49	27	C	0.23	17	B
	WBT	0.65	39	D	0.70	39	D	0.41	26	C
	WBR	0.47	38	D	0.39	35	C	0.20	24	C
	NBL	0.88	52	D	0.80	38	D	0.66	37	D
	NBT	0.61	36	D	0.81	51	D	0.59	46	D
	NBR	0.14	30	C	0.07	38	D	0.05	41	D
	SBL	0.80	40	D	0.86	47	D	0.74	36	D

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	SBTR	<b>0.91</b>	59	E	0.79	49	D	0.76	49	D
Louis St. Laurent Avenue & Private Access	<i>Overall</i>	<i>0.47</i>	5	A	<i>0.43</i>	5	A	<i>0.36</i>	7	A
	EBL	0.09	3	A	0.19	3	A	0.17	4	A
	EBT	0.47	4	A	0.42	3	A	0.34	3	A
	WBTR	0.39	1	A	0.42	1	A	0.33	2	A
	SBL	0.49	53	D	0.48	56	E	0.51	53	D
	SBR	0.03	49	D	0.04	52	D	0.05	49	D

As seen in **Table 8-3**, under future background 2032 conditions Scenario 2, Bronte Street South and Louis St. Laurent Avenue operate overall with a v/c ratio of 0.86, 0.84, and 0.61 in the a.m., p.m., and Saturday peak hours, respectively. All individual movements operate with reserve capacity with LOS 'E' or better. The southbound left movement at Bronte Street South and Louis St. Laurent Avenue is approaching capacity, with a v/c ratio of 0.91 in the a.m. peak hour and a delay of 59 seconds. These movements reach critical capacity and should be further considered for additional traffic improvements such as the proposed exclusive southbound right-turn lane.

Under the future background conditions, Louis St. Laurent Avenue and North Site Access operates as a T-intersection (without the south leg serving the subject site) and operates with sufficient capacity; individual movements and operates within capacity with an LOS 'E' or better.

### 8.2.3 Scenario 3: Addition of Southbound Right-Turn Lane at Bronte Street South and Louis St. Laurent Avenue

**Table 8-4** summarizes the future background 2032 capacity analysis results for the weekday a.m., p.m., and Saturday peak hours under Scenario 3.

**Table 8-4 Future Background 2032 Capacity Analysis Summary – Scenario 3**

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Bronte Street South & Louis St. Laurent Avenue	<i>Overall</i>	<i>0.84</i>	39	D	<i>0.84</i>	38	D	<i>0.60</i>	31	C
	EBL	0.70	30	C	0.77	40	D	0.44	13	B
	EBT	0.72	34	C	0.63	31	C	0.41	20	C
	EBR	0.54	29	C	0.41	26	C	0.23	15	B
	WBL	0.60	30	C	0.50	27	C	0.22	16	B
	WBT	0.61	37	D	0.71	40	D	0.40	25	C

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
	WBR	0.45	36	D	0.40	35	D	0.20	23	C
	NBL	0.88	50	D	0.74	33	C	0.61	36	D
	NBT	0.64	38	D	0.82	51	D	0.66	49	D
	NBR	0.14	31	C	0.07	38	D	0.05	43	D
	SBL	0.82	45	D	0.83	43	D	0.77	40	D
	SBT	0.84	53	D	0.58	40	D	0.64	47	D
	SBR	0.07	38	D	0.08	35	D	0.08	41	D
Louis St. Laurent Avenue & Private Access	<i>Overall</i>	<i>0.47</i>	<i>5</i>	<i>A</i>	<i>0.43</i>	<i>5</i>	<i>A</i>	<i>0.36</i>	<i>6</i>	<i>A</i>
	EBL	0.09	3	A	0.19	3	A	0.17	4	A
	EBT	0.47	4	A	0.42	3	A	0.34	3	A
	WBTR	0.39	1	A	0.42	1	A	0.33	1	A
	SBL	0.49	53	D	0.48	56	E	0.51	53	D
	SBR	0.03	49	D	0.04	52	D	0.05	49	D

As seen in **Table 8-4**, under future background 2032 conditions Scenario 3, Bronte Street South and Louis St. Laurent Avenue operate overall with a v/c ratio of 0.84, 0.84, and 0.60 in the a.m., p.m., and Saturday peak hours, respectively. All individual movements operate with reserve capacity with LOS 'D' or better. The addition of the southbound right-turn lane improves the overall operations of the intersection for not only the southbound movement, but for all other movements at this intersection.

Under the future background conditions, Louis St. Laurent Avenue and North Site Access operates as a T-intersection (without the south leg serving the subject site) and operates with sufficient capacity; individual movements operate within capacity and have an LOS 'E' or better.

### 8.3 Future Total 2032 Conditions

**Table 8-5** summarizes the future total 2032 capacity analysis results for the weekday a.m., p.m. and Saturday peak hours. The timings at Bronte Street South and Louis St. Laurent Avenue were further optimized and an overlap phase was added to the eastbound and westbound right turns. From a capacity standpoint, they are not required and therefore as discussed in **Section 10** the traffic patterns should be monitored to determine if the background projections are as high as estimated. For the north site access on Louis St. Laurent Avenue, the signalized intersection that was built had signal heads for the eastbound and westbound left-turns, they were assumed to be active for the future total conditions. The analysis also considered northbound and

southbound left-turn phases at the same location.

**Table 8-5 Future Total 2032 Capacity Analysis Summary**

Intersection	Movement of Interest	Weekday AM			Weekday PM			Saturday		
		v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Bronte Street South & Louis St. Laurent Avenue	<i>Overall</i>	<b>0.88</b>	36	D	<b>0.87</b>	38	D	0.66	29	C
	EBL	0.77	42	D	0.80	59	E	0.55	10	A
	EBT	0.75	28	C	0.68	29	C	0.44	13	B
	EBR	0.43	4	A	0.34	3	A	0.24	5	A
	WBL	0.70	37	D	0.52	29	C	0.26	18	B
	WBT	0.67	40	D	0.81	47	D	0.45	27	C
	WBR	0.39	24	C	0.31	20	B	0.19	24	C
	NBL	0.90	53	D	0.76	32	C	0.67	36	D
	NBT	0.68	39	D	0.79	48	D	0.61	45	D
	NBR	0.17	32	C	0.06	37	D	0.05	40	D
	SBL	0.80	41	D	0.87	48	D	0.81	46	D
	SBT	<b>0.86</b>	54	D	0.64	43	D	0.70	49	D
Louis St. Laurent Avenue & North Site Access	<i>Overall</i>	0.59	16	B	0.62	16	B	0.54	21	C
	EBL	0.10	8	A	0.22	11	B	0.20	10	A
	EBTR	0.63	15	B	0.61	14	B	0.58	19	B
	WBL	0.23	12	B	0.45	34	C	0.40	23	C
	WBTR	0.50	10	A	0.44	4	A	0.44	12	B
	NBL	0.39	42	D	0.71	59	E	0.44	39	D
	NBTR	0.02	39	D	0.08	43	D	0.07	47	D
	SBL	0.57	55	E	0.36	47	D	0.40	47	D
Bronte Street South & East Access	EBR	0.04	10	A	0.09	10	B	0.07	10	A
	NBT	0.41	0	A	0.35	0	A	0.24	0	A
	SBTR	0.48	0	A	0.39	0	A	0.32	0	A

As seen in **Table 8-5**, all intersections and site accesses operate with sufficient reserve capacity and relatively low delays. For Bronte Street South and Louis St. Laurent Avenue, as observed under baseline and future background conditions, the northbound left-turn movement operates with a v/c ratio 0.90 in the a.m. peak hour. At the north access along Louis St. Laurent Avenue, individual movements continue to operate within capacity, which is observed in the shared eastbound

through-right movement. The northbound left movement contributes to the maximum individual movement delay of 59 seconds. All other movements operate with sufficient capacity and relatively low delays and thus do not pose as a conflict to the traffic operations. In comparison to the future background conditions, the overall intersection delay does not change significantly for any time period at Bronte Street South and Louis St. Laurent Avenue. This is partly attributed to the extra capacity of the overlaps, but also shows that the site traffic impact to the intersection is minimal when compared to the future background.

## 9 ROUNDABOUT ANALYSIS

Roundabout capacity analysis was conducted for the intersection of Bronte Street South and Whitlock Avenue under baseline and future 2032 traffic conditions. Traffic volumes were analyzed in Sidra roundabout capacity software. Peak hour level of service (LOS), delay results, capacity, and 95<sup>th</sup> percentile queueing are summarized in **Table 9-1**, **Table 9-2**, and **Table 9-3** for the Existing, Future Background, and Future Total scenarios, respectively. Details of the roundabout analysis results are provided in **Appendix L**.

**Table 9-1 Baseline Roundabout Capacity Analysis Summary**

Intersection	Peak Hour	Approach	95% Queue (veh)	Delay (s)	v/c	LOS
Bronte Street South & Whitlock Avenue	AM	Overall	3	5	0.47	A
		South	2	5	0.31	A
		East	3	7	0.47	A
		North	3	5	0.36	A
	PM	Overall	1	4	0.18	A
		South	1	4	0.18	A
		East	1	4	0.18	A
		North	1	5	0.16	A
	SAT	Overall	1	4	0.14	A
		South	1	4	0.11	A
		East	0	3	0.10	A
		North	1	5	0.14	A

As seen in **Table 9-1**, the roundabout intersection of Bronte Street South and Whitlock Avenue operates well under baseline conditions for a.m., p.m., and Saturday peak hours. The roundabout approaches experience a delay of 7 seconds or less for any given peak hour. The roundabout operates with an overall LOS 'A' during all peak hours.

**Table 9-2 Future Background 2032 Roundabout Capacity Analysis Summary**

Intersection	Peak Hour	Approach	95% Queue (veh)	Delay (s)	v/c	LOS
Bronte Street South & Whitlock	AM	Overall	6	7	0.68	A
		South	5	6	0.57	A
		East	6	10	0.68	A

Intersection	Peak Hour	Approach	95% Queue (veh)	Delay (s)	v/c	LOS
Avenue		North	6	7	0.62	A
		West	1	8	0.17	A
	PM	<i>Overall</i>	3	6	0.43	A
		South	3	7	0.43	A
		East	2	4	0.30	A
		North	3	6	0.40	A
		West	1	6	0.19	A
	SAT	<i>Overall</i>	2	5	0.30	A
		South	1	5	0.24	A
		East	1	3	0.14	A
		North	2	5	0.30	A
		West	1	6	0.10	A

As seen in **Table 9-2**, similar to the baseline conditions, the roundabout operates well under all peak hours. The individual approaches are expected to experience maximum delays of 10 seconds or less. The roundabout operates with an overall LOS 'A' during all peak hours.

**Table 9-3 Future Total 2032 Roundabout Capacity Analysis Summary**

Intersection	Peak Hour	Approach	95% Queue (veh)	Delay (s)	v/c	LOS
Bronte Street South & Whitlock Avenue	AM	<i>Overall</i>	13	12	0.91	B
		South	8	9	0.67	A
		East	13	24	0.91	C
		North	9	10	0.71	B
		West	5	12	0.58	B
	PM	<i>Overall</i>	5	7	0.55	A
		South	5	9	0.55	A
		East	3	5	0.42	A
		North	4	7	0.47	A
		West	3	6	0.38	A
	SAT	<i>Overall</i>	3	6	0.39	A
		South	3	8	0.38	A
		East	2	4	0.23	A

Intersection	Peak Hour	Approach	95% Queue (veh)	Delay (s)	v/c	LOS
		North	3	7	0.39	A
		West	2	5	0.35	A

As seen in **Table 9-3**, under Future Total 2032 conditions, the individual movements at the roundabout experience a maximum delay of 24 seconds and operate with LOS 'C' or better; however the intersection operates with an overall LOS 'A' at all peak hours. Thus, no traffic related conflicts are expected with the added site traffic generated by the proposed development.

## 10 TRAFFIC QUEUING OPERATIONS

Queueing analysis was completed using SimTraffic Version 11 microsimulation software. SimTraffic output reports are provided in **Appendix M**. Queueing reports were prepared through SimTraffic microsimulation based on 10 simulation runs, each run consisting of a 10-minute seeding time and a 60-minute recording time.

The table below provides a summary of the 95<sup>th</sup> percentile queues derived from microsimulation of existing and future conditions. The available storage for each movement is provided based on the existing road network. The 95<sup>th</sup> percentile queue lengths that are bolded in **Table 10-1** are predicted to extend beyond available storage of a dedicated turn lane or extend beyond an upstream intersection and/or major access point. It is noted that queueing analysis for future background conditions was done for Scenario 3 only.

**Table 10-1 Summary of SimTraffic 95<sup>th</sup> Percentile Queues by Horizon**

Intersection	Movement of Interest [Future Movement]	Available Storage [Proposed Storage] (m)	95 <sup>th</sup> Percentile Queue (m)								
			Baseline			Background 2032			Future Total 2032		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
Bronte Street South & Louis St. Laurent Avenue	EBL	40	26	35	26	<b>80</b>	<b>121</b>	<b>45</b>	<b>101</b>	<b>139</b>	<b>54</b>
	EBTR [EBR]	- [30]	60	33	28	<b>78</b>	<b>69</b>	<b>31</b>	<b>84</b>	<b>94</b>	<b>31</b>
	WBL	45	29	21	15	<b>53</b>	<b>74</b>	26	<b>96</b>	<b>132</b>	28
	WBTR [WBR]	- [30]	36	41	30	<b>64</b>	<b>69</b>	<b>32</b>	<b>61</b>	<b>134</b>	28
	NBL	35	<b>68</b>	<b>43</b>	26	<b>92</b>	<b>79</b>	<b>49</b>	<b>101</b>	<b>84</b>	<b>56</b>
	NBTR [NBR]	- [50]	47	41	31	26	22	14	29	20	15
	SBL	35	<b>53</b>	<b>43</b>	41	<b>106</b>	<b>94</b>	<b>70</b>	<b>114</b>	<b>94</b>	<b>83</b>
	SBTR [SBR]	- [50]	50	42	42	35	22	21	68	31	23
Louis St. Laurent Avenue & North Site Access	EBL	75	-	-	-	14	21	21	12	112	17
	[EBTR]	[-]	-	-	-	-	-	-	92	258	77
	WBL	25	-	-	-	-	-	-	19	<b>41</b>	<b>29</b>
	WBTR	-	-	-	-	27	30	24	62	52	68
	NBL	-	-	-	-	-	-	-	37	54	54
	NBTR	-	-	-	-	-	-	-	17	55	24
	SBL	30	-	-	-	<b>37</b>	<b>49</b>	<b>40</b>	<b>35</b>	<b>34</b>	<b>32</b>
SBR [SBTR]	- [-]	-	-	-	16	18	18	22	36	24	
Bronte Street	EBR	-	-	-	-	-	-	-	12	15	14

Intersection	Movement of Interest [Future Movement]	Available Storage [Proposed Storage] (m)	95 <sup>th</sup> Percentile Queue (m)								
			Baseline			Background 2032			Future Total 2032		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
South & East Access	SBTR	-	-	-	-	-	-	-	1	1	2

As seen in **Table 10-1**, some of the 95<sup>th</sup> percentile queues exceed the available storage length. However, it is important to note that the 95<sup>th</sup> percentile queues determined by SimTraffic represent a statistical value based on the average queues measured over the course of the simulation and are a conservative value to use when assessing the storage. Even the existing conditions indicate that queue length exceeds the capacity. Additionally, the queues are significantly longer than the existing conditions in the future background and the future total has queue lengths that are similar. Therefore, the 95<sup>th</sup> percentile queues exceeding the storage recommended by the Boyne RNA is attributable to the background volume projections. It is recommended that the volume at this intersection be monitored to determine if the traffic patterns forecasted by the background developments occur and if the storage needs to be adjusted to accommodate that traffic. Based on the relatively minimal traffic from the proposed development using the critical movements at Bronte Street South and Louis St. Laurent Avenue, it is anticipated that the resolution for the background traffic, if required, would benefit the queuing for the future total horizon. Furthermore, although the turning lanes may exceed capacity at the 95<sup>th</sup> percentile queues, the spillback does not propagate throughout the network as the through lane queues (which are included in the detailed SimTraffic reports) do not spillback to the upstream intersections.

## 10.1 Traffic Circle Queueing Analysis

As per the Town’s request, a high-level queueing analysis was conducted in SimTraffic for the proposed traffic circle at the Whitlock Avenue extension, with access to the District Park and the main north-south road through the site (Street ‘B’ at Steet ‘A’) to determine if there are spillback implications onto the existing roundabout at Whitlock Avenue and Bronte Street South. The results are shown in **Table 10-2** below. SimTraffic queueing results for the traffic circle can be found in **Appendix M**.

**Table 10-2 Traffic Circle Queueing Analysis Summary**

Intersection	Movement of Interest	Available Storage (m)	95 <sup>th</sup> Percentile Queue (m)		
			Future Total 2032		
			AM	PM	SAT
District Park Entrance / Street ‘A’ & Street ‘B’	WBTR	-	0	0	0
	EBLT	-	10	16	14
	SBLR	-	10	12	16

As seen in **Table 10-2** above, there are no westbound queues identified from the queueing analysis at the traffic circle for any of the peak hours. The Whitlock Avenue segment between the roundabout and Bronte Street South is approximately 50 metres in length and can accommodate approximately 7 queued vehicles without impacting Bronte Street South. Therefore, there is no concern of traffic spilling over onto the adjacent roundabout at Whitlock Avenue and Bronte Street South. Furthermore, the eastbound and southbound queues are minimal and are not expected to impact traffic flow.

# 11 ROUNDABOUT TRAFFIC CONTROL

In the previous April 2022 submission, the previous Draft Plan proposed a roundabout internal to the development located between the north commercial blocks and the south residential blocks. With the revised Draft Plan in this updated study, an all-way stop-controlled intersection is proposed in replacement of the previously proposed roundabout and will be located at the intersection of Street 'B' and Street 'D' / Street 'C'. This revised intersection control is expected to better accommodate the anticipated traffic patterns and improve active transportation connectivity and safety. Given the context of the development, an all-way stop-controlled intersection connecting the commercial blocks and residential blocks is proposed.

## 11.1 Roundabouts and Vulnerable Users

Roundabouts have specific geometric design and traffic control features to improve the safety and capacity of an intersection. Municipalities often consider roundabouts as an alternative to a typical stop-controlled intersection, as fewer conflict points and larger inscribed circle diameters force motorists to reduce speed. However a study of 332 roundabouts (constructed between 1995 and 2009) in Denmark found a 65% increase in total bicycle crashes and a 40% increase in bicycle injury crashes after the installation of roundabouts (Jensen, "Safety effects of converting intersections to roundabouts." *Transportation Research Record: Journal of the Transportation Research Board* 2013). Furthermore, a study of 202 roundabouts in 15 towns across western France found that cyclists experience nearly double the increase in collisions in roundabouts compared to a typical stop-controlled/signalized intersection. At a typical stop-controlled/signalized intersection, cyclists represent 3.7% of the overall collisions and with roundabouts in place cyclists experience 7.3% of overall collisions (U.S. Department of Transportation – Federal Highway Administration, "Roundabout: An Informational Guide").

Forcing motorists to reduce speed by modifying an intersection's geometry is a key aspect of designing an intersection for all users. Since speeds are reduced when entering the roundabout, this allows drivers to make less risky decisions when navigating the roundabout which in turn can further prevent possible conflicts between road users. It is apparent through studies of roundabouts that the speed of motorists can be controlled through the design of a roundabout, and pedestrians and cyclists are only required to look in one direction for approaching vehicles when crossing at roundabouts (adding an element of safety). It is proven that the lower the speed of a vehicle is in a collision, the higher chance of people surviving a severe collision.

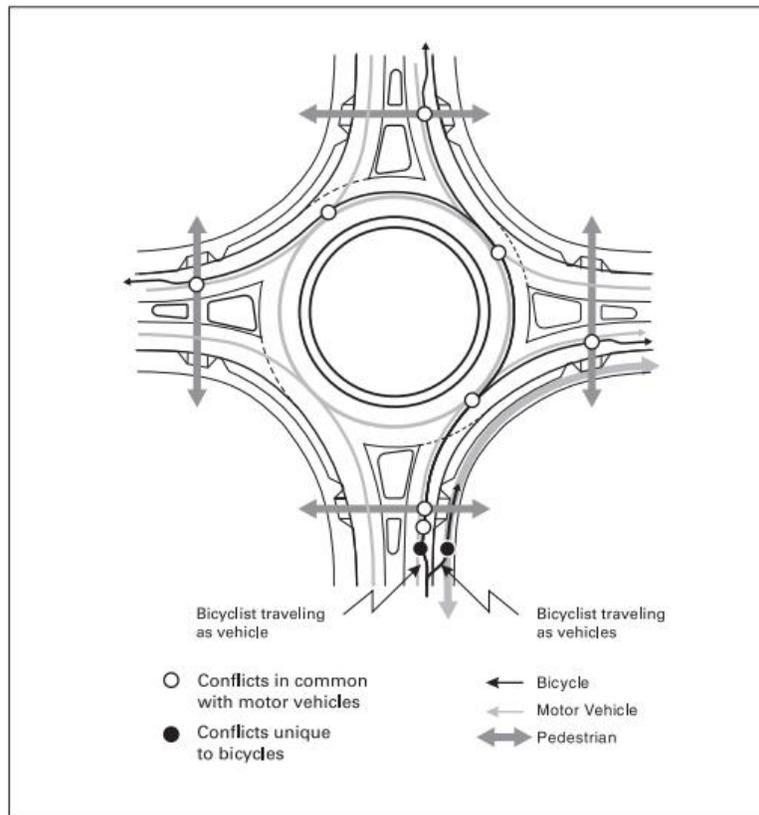
**Figure 11-1** illustrates potential conflict zones between motorists and vulnerable users, such as cyclists, at a roundabout. In a 2-lane roundabout, multiple vehicle-to-cyclist conflict points exist when cyclists merge from the outer to inner lane. **Figure 11-2** illustrates the potential conflict

zones between cyclists and automobiles if multi-use paths/cycle tracks were in place, redirecting cyclists to cross at the crosswalks.

**Figure 11-1 Potential Conflict Zones Between Cyclists and Automobiles in a Roundabout**



**Figure 11-2 Potential Conflict Zones Between Cyclists Crossing at Crosswalks and Automobiles in a Roundabout**



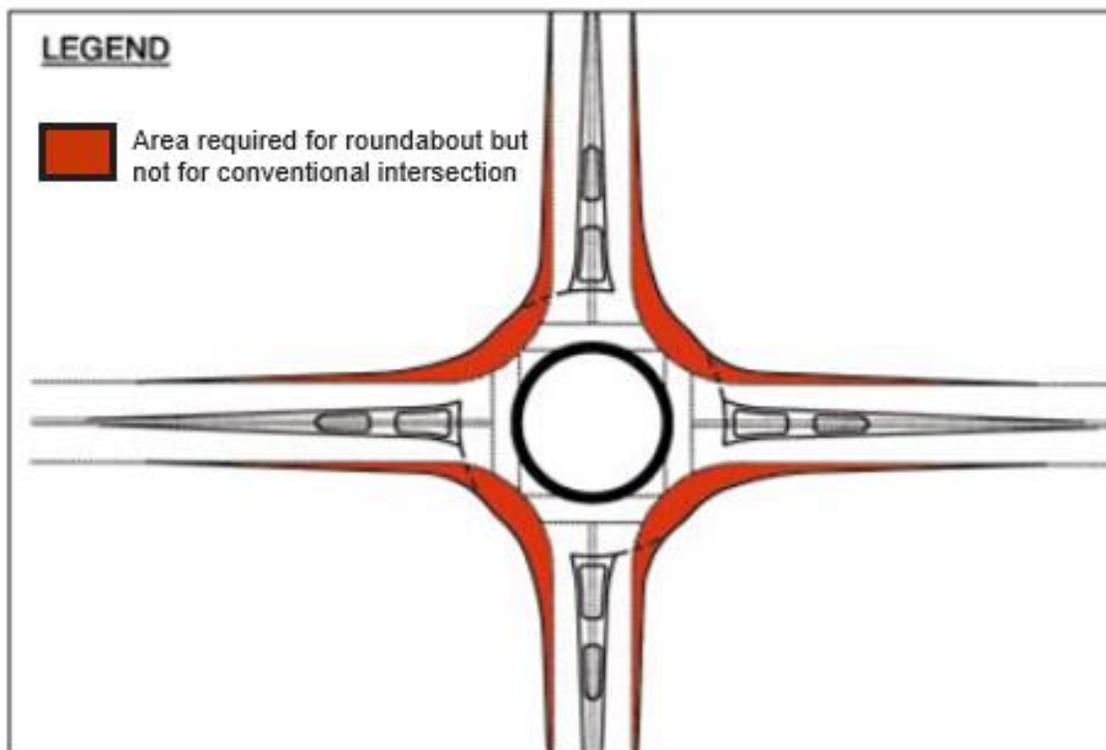
## 11.2 Spatial Impacts of Roundabouts

The biggest struggle with implementing a roundabout at an intersection is spatial impact. For example, as per Transportation Association of Canada (TAC) design guidelines, a single lane roundabout with a WB-20 truck (typical 53' semi-trailer truck) as its design vehicle requires an inscribed circle diameter (ICD) from 40 to 60 metres, and a WB-17 truck requires an ICD of 36 metres. However, the right-of-way impact of a roundabout is much more than the required ICD, as a typical roundabout requires sidewalks, boulevard space, and other utilities that require additional space within each approach.

Larger roundabouts can be intimidating for pedestrians due to long crossing distances. This can make them less pedestrian-friendly compared to traditional intersections with clearly marked crosswalks and/or signals. Roundabouts require a significant amount of land to accommodate their circular design. In greenfield spaces, where land might be abundant but needs to be used efficiently, this can be a drawback compared to more compact intersection designs.

**Figure 11-3** illustrates how a typical roundabout requires more land than a conventional intersection.

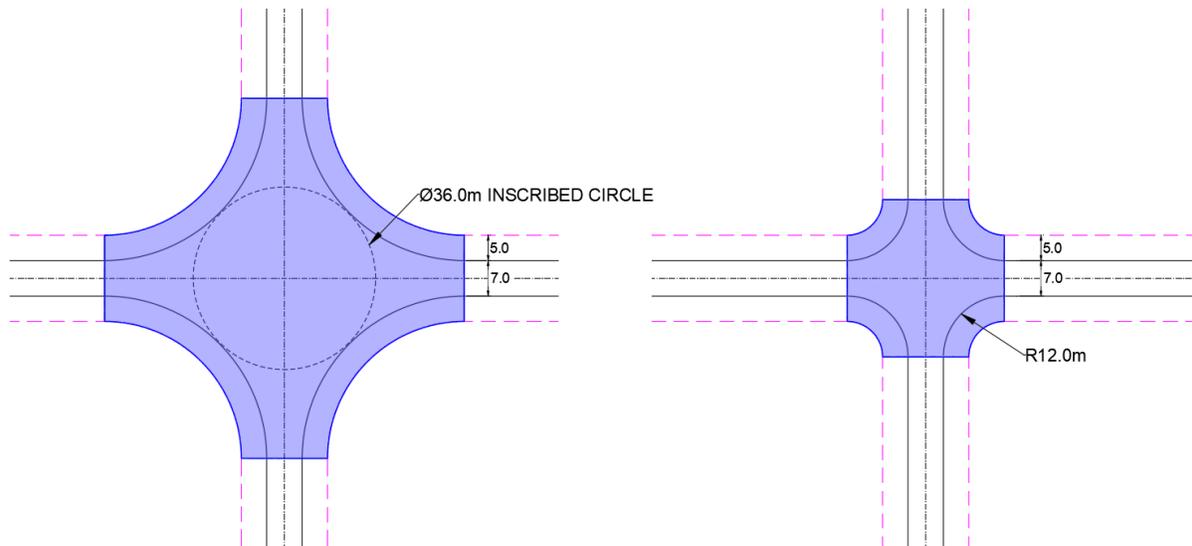
**Figure 11-3 Spatial Impacts of a Roundabout vs. Conventional Intersection**



**Figure 11-4** provides a numerical example of the land required for a roundabout compared to an equivalent conventional intersection. The comparison concluded that approximately 3.4 times the

ROW space is required for a roundabout compared to a conventional intersection (implying 3.4 times the amount of undevelopable land is created by a roundabout vs. a conventional intersection). The comparison was based on a 26 metre ROW with bicycle lanes and parking lanes excluded, only considering pavement assigned to general purpose lanes. A five-metre boulevard was applied to either side of the traveled roadway for both the roundabout and traditional 4-leg intersection for consistency.

**Figure 11-4 Example of Roundabout vs. Conventional Intersection Land Requirements**



1. 36m diameter inscribed circle diameter is a typical roundabout design as it can accommodate transit buses and WB-15 trailer truck
2. 12m curb radius was used for a typical conventional intersection

### 11.3 Development Context and Suitability of Roundabouts

While roundabouts are often highlighted for their ability to move traffic through an intersection with minimal delays and stoppage of vehicles compared to traditional AWSC intersections, this is not always the case if the inbound flow of traffic is not relatively balanced.

When the flow of traffic along the major roadway is relatively heavy, this creates insufficient gaps for traffic from the minor road to be able to traverse the intersection. In the case of a roundabout, if the traffic flow entering from the major road is too heavy, traffic from the minor road is continually yielding to cars already in the roundabout from the major road. This can lead to much longer delays for minor road traffic compared to a conventional AWSC intersections where vehicles from all legs are required to stop before proceeding through the intersection.

It is TYLin’s understanding that the SMUN Lands aim to create connected and walkable mixed-

use lands with convenient active transportation infrastructure throughout the development. Even though roundabouts provide a generally safe environment for pedestrians by reducing pedestrian crossing distances (only crossing one lane of traffic at a time) and in-boulevard bicycle facilities, pedestrians and cyclists tend to avoid using roundabouts when possible due to its atypical design.

Accordingly, planning for a roundabout in the center of the SMUN Lands area may not be the best option when aiming for a more family-friendly transportation network that links residents and retail patrons to parks, and other community areas. A reduction in roundabouts assists in achieving the Town's goals of providing compact, walkable communities that promote the use of active transportation.

## 12 ACTIVE TRANSPORTATION

Although the subject development is in the redline to the approved Draft Plan application stage, a proposed active transportation network has been designed by the MBTW Group. While the detailed internal active transportation connections will not be finalized until the Commercial Blocks site plan application stage, at which time a more thorough review can be conducted, the following internal active transportation features are currently proposed:

- ▶ Several north-south and east-west pedestrian walkways are proposed within Blocks 44 and 45 to provide safe movement of pedestrians throughout the retail component of the site
- ▶ 3.0m wide multi-use trails are proposed on both sides of Street 'A' in order to extend the existing active transportation facilities on Whitlock Avenue west from Bronte Street South to provide a connection to the District Park and other Draft Plan land uses.
- ▶ 1.5m wide sidewalks and on-street bike lanes are proposed on both sides of Street 'B' in order to provide residents and retail customers a north-south connection between Street 'A' and Louis St. Laurent Boulevard.
- ▶ 1.5m wide sidewalks are proposed on at least one side of the road throughout the residential townhouse units and high-rise apartment units, in order to provide residents a connection to the rest of the subject, main north-south road through the site, and Bronte Street South
- ▶ Residents will have direct access to the District Park via the internal pedestrian connections. This would allow ease of access to the proposed 3m wide trail located along the northern boundary of the District Park, immediately south of the townhouse units.
- ▶ The proposed Internal sidewalks and walkways provide connectivity throughout the site and to the existing external active transportation network through connections to Louis St. Laurent Avenue and Bronte Street South.

The District Park component of the Draft Plan is located immediately south of the residential townhouse Blocks and is generally south of Whitlock Avenue and the future Active Transportation Link that crosses the CNR tracks.

A 3m wide trail is proposed to run along the northern and western limits of the District Park, connecting to existing active transportation infrastructure at the Bronte Street South and Whitlock Avenue roundabout along with the future active transportation link across the railway tracks. By the trail running along the perimeter of the park, there is ample opportunity for connections between the park and adjacent residential blocks of the Draft Plan.

It is important to note that the District Park's trail connection to the future Active Transportation Link will provide access across the railway further south of Louis St. Laurent Avenue, providing an alternative, off-road route for pedestrians and cyclists to move between lands east and west of the rail line. This provides a greater level of connectivity within the area, and the opportunity for increasing active transportation in and around the mixed-use node east of the railway. For example, residents from the west side of the CNR tracks could walk or cycle to the District Park and retail uses in Blocks 44 and 45 of the proposed Draft Plan without first having to travel north to Louis St. Laurent, or south to Britannia Road to safely cross the rail line.

In general, the future Active Transportation Link across the CNR line and its connection to, and through, the District Park will have a positive impact on the Draft Plan and surrounding area not only from a connectivity perspective, but also from a pedestrian and cyclist safety perspective. The Active Transportation Link also has the potential to be a key contributor to increasing the mode share of active transportation uses within the subdivisions and communities immediately surrounding the District Park.

## 13 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) refers to various measures that are undertaken to encourage non-auto modes of travel and to reduce single occupant vehicle (SOV) traffic. These have direct impacts to both parking and trip-related aspects of the site. TDM measures can be categorized into five categories and are listed as follows:

1. Introduction of Alternative Travel Modes
2. Core Commuter Information and Assistance
3. Financial Incentives
4. Supporting Infrastructure
5. TDM Program Support

### 13.1 Introduction to Alternative Travel Modes

The introduction of new modes of travel to current single-occupant vehicle drivers can be accomplished by utilizing various marketing and communication strategies. For the residential land uses, this can be accomplished through raising awareness of the availability for alternate travel modes for residents. It is recommended that TDM marketing material be provided to all residents, and that any updates to the transit / active transportation infrastructure be posted in at locations with significant pedestrian foot-traffic or provided at the sale of the residential unit.

Marketing material should be prepared and provided by Town, Region, and Milton Transit staff to ensure that the information provided is up to date. It is also important that the documents be visually appealing to be more approachable. This will help to target and encourage non-driver modes of transportation from the earliest point in the process.

Outreach events are another method to promoting TDM measures. It is recommended that an outreach event be hosted for residents of the site following a minimum of 50% occupancy. Town, Region, and Milton Transit staff should be invited to attend the event to answer any questions from residents or employees and provide information on the existing infrastructure and planned infrastructure improvements. Future outreach events can also be planned to promote any new TDM measures and facilities. The event can be held at a nearby public park, school or community centre. Should the attendance of a TDM outreach event be insufficient to justify attendance of Town / Regional / Milton Transit staff, the TDM marketing material can be mailed to each household. Alternatively, an online meeting can be held to promote the available TDM measures.

## 13.2 Core Commuter Information and Assistance

In addition to marketing and communicating the availability of alternative travel modes, it is important to ensure that those seeking to change their travel behaviours have the tools and information to facilitate this change. Information on the available transit routes and bus stops, and active transportation network should be readily available for anyone looking to travel to or from the site. Improving the ease of access to information of alternative travel modes increases the willingness for behavioural change amongst commuters. It is recommended that carpool ride-matching tool such as [www.ridesharing.com](http://www.ridesharing.com) and carpool networking be promoted at the TDM outreach event for commuters to meet and find other commuters looking to carpool together.

The information should be prepared by the Town, Region, and Milton Transit and distributed at the TDM outreach event.

## 13.3 Financial Incentives

It is understood that one of the primary factors in behavioural change is monetary compensation. The purpose of providing financial incentives is to promote this change in behaviour and incentivise commuters with trying out new alternate travel modes. This financial support can come in the form of subsidized transit passes or other future subsidies (such as rideshares). It is recommended that a subsidized transit fare be provided for each residential unit purchased in the first year of occupancy. The exact amount and provision of the subsidized transit fare is subject to the discretion of the Owner. The subsidized transit fare can be distributed at the TDM outreach event, mailed to each household individually.

## 13.4 Supporting Infrastructure

Physical infrastructure is necessary to support transit and active transportation modes. The infrastructure should be developed and improved for both the site as well as the Town and Region. For the proposed development, some examples of supportive infrastructure include:

- ▶ Sheltered transit stops;
- ▶ Pedestrian sidewalks;
- ▶ Benches and other streetscape furniture;
- ▶ Cycling facilities (shared or dedicated bicycle paths); and
- ▶ Multi-use paths

## 13.5 TDM Program Support

The TDM programs can be further supported through the involvement with a Transportation Management Associations (TMA). TMA's can provide support to TDM programs through the provision of promotional material, coordination of programs and events, and recommendations on the appropriate measures to be implemented. This is especially important for any "walk-to-school" programs to encourage students to have a positive mindset towards active transportation.

Facilitating the implementation and management of these TDM programs can be accomplished through the effective employment or assignment of a TDM coordinator. The role of the TDM coordinator is to implement, manage and monitor the TDM measures in place for the development. It is recommended that a TDM coordinator be assigned by the Region or Region to ensure the success of the TDM plan for the area.

In addition to implementation of these programs, it is important to monitor both the success and the opportunities for improvement for the TDM measures. It is recommended that a baseline survey be conducted at the full build-out of the development to identify residential and staff travel behaviours. A follow-up monitoring survey should then be conducted every two years to measure the effectiveness of the TDM programs and provide recommendations for improvements. The provision of the monitoring survey, follow-up surveys and future TDM programs would be at the discretion of the TDM coordinator.

## 13.6 TDM Measure Checklist

Based on the above TDM classifications, a checklist has been developed in **Table 13-1** which summarizes the proposed TDM measure, a brief description and the entity(s) which would be responsible for maintaining and organizing the program.

This has also been compared to the City of Kitchener / Region of Waterloo's TDM Implementation Checklist, which indicates the TDM supportive nature of the proposed site. It is noted that this checklist is primarily intended to be used within the Region of Waterloo, and is considered to be used with caution when evaluating the nature of the TDM measures for the area. The TDM checklist has been included in **Appendix N**.

**Table 13-1 Recommended TDM Measure Checklist**

Category	TDM Strategy	Description	Responsibility
<b>Introduction of Alternative Travel Modes</b>	Information Brochures	Provide brochures with information on transit routes & stops, active transportation infrastructure and TDM programs within the respective development. Information should be provided by Town, Region, and Milton Transit staff and distributed at a TDM outreach event or by mail.	All
	Marketing Materials	Marketing material should be made visually attractive and function as both promotion and information of TDM programs and events.	All
	TDM Themed Community Events	TDM themed event should be considered to encourage non-SOV travel as well as improving community involvement. Events could include “Walk to School” or “Bike to Work” events and would be organized by a TDM coordinator assigned by the Town or Region.	All
	TDM Outreach Events	A specific outreach event should be held to reach out to new residents and employees of the development. The TDM outreach event would function as a platform for Town, Region, and Milton Transit Staff to answer questions and provide information on the available and upcoming transit / AT infrastructure. The event would also provide a good location to distribute any TDM material such as subsidized transit passes and	All

Category	TDM Strategy	Description	Responsibility
		TDM Information Brochures.	
<b>Core Commuter Information / Assistance</b>	Carpool Ride Matching Platforms and Events	Promote online carpool ride matching platforms such as <a href="http://www.ridesharing.com">www.ridesharing.com</a> or host carpool networking events to provide safe and efficient methods for carpool drivers and passengers to connect.	All
<b>Financial Incentives</b>	Subsidized Transit Passes	Provide a subsidized transit fare for all residential units purchased within the first year of occupancy. The exact amount and provision of the subsidized transit pass is subject to the discretion of the Owner.	Owner
<b>Supporting Infrastructure</b>	Sheltered Transit Stops	Provide sheltered facilities at transit stops to promote transit usage. Sheltered facilities should provide information on transit routes and protection from the weather. Additional transit stops and services should also be considered.	Milton Transit
	Pedestrian Sidewalks	Provide appropriate pedestrian connections to encourage and facilitate active transportation. This will also provide the necessary connections to transit stops.	All
	Cycling Facilities / Trails / Multi-Use Paths	Provide cycling accessible facilities to expand the cycling network and improve accessibility for its users.	All
<b>Program Support</b>	TDM Coordinator / Transportation Management Association	A TDM coordinator or TMA would implement, manage and monitor the TDM programs identified in this plan. Coordinating TDM programs across the land uses would improve the effectiveness.	Town & Region

Category	TDM Strategy	Description	Responsibility
	Monitoring Survey	Conduct TDM monitoring surveys to track changes in travel patterns and the success of the implemented TDM programs. It is recommended to conduct a baseline survey with residents when the site is fully occupied and conduct follow-up surveys once every two years. The provision of the monitoring survey is subject to the discretion of the TDM Coordinator.	TDM Coordinator

## 14 CONCLUSIONS AND RECOMMENDATIONS

As a result of the analysis completed to produce this report, TYLin provides summary of recommended transportation works, beyond what is already proposed in the Boyne RNA Study, that are required to support the proposed development.

At the intersection of Bronte Street South and Whitlock Avenue, the design of the west leg of the roundabout is proposed to mirror the current lane configurations of the east leg to provide lane continuity and alignment. A conceptual design has been provided that indicates the potential alignment of the leg with the site's condo road as well as a potential interconnection to the District Park.

As per Boyne RNA study road improvements, eastbound, westbound, and northbound right-turn lanes at Bronte Street South and Louis St. Laurent Avenue were included as part of the future background and future total traffic analysis. Additionally, to improve future background queueing operations, a 50-metre auxiliary southbound right-turn lane at Bronte Street South and Louis St. Laurent Avenue is recommended in future background horizon and maintained for the future total horizons. It is not needed for capacity purposes. As noted in the report, this improvement was not assumed in the Boyne RNA, however based on the current traffic projections and pedestrian it alleviates the queueing issues in the future background horizon. It is recommended that the intersection be monitored to determine if the improvement is necessary based on the actual demand.

The signal phasing at Bronte Street South and Louis St. Laurent Avenue was also updated from the Boyne RNA with the westbound left also being recommended to be protected-permitted consistent with the other left-turns at the intersection. This timing adjustment was recommended in the future background and carried forward into the future total. For the future total conditions, and right-turn overlap was recommended to reduce the queues for the westbound and eastbound right turns at Bronte Street South and Louis St. Laurent Avenue. This improvement was not required from a capacity standpoint.

Under baseline 2025 conditions, all intersections operate with sufficient reserve capacity and low delays. Under future background 2032 conditions, the addition of all background development and Boyne survey area traffic volumes significantly increases the v/c ratios for several critical movements at the intersection of Bronte Street South and Louis St. Laurent Avenue, as well as the north access at Louis St. Laurent Avenue. However, the study intersections operate with sufficient reserve capacity. The overall intersection delay at Bronte Street South and Louis St. Laurent Avenue increased significantly from the existing conditions but does not exceed LOS 'D'. Under future total conditions, site generated traffic does not attribute to a significant increase in volumes relative to the background conditions at the same intersection and this is reflected by the minimal difference

in the overall intersection delay. Thus, study intersections operate with sufficient reserve capacity and can accommodate the additional of the proposed site traffic.

It is recommended that the traffic volumes be monitored by the Town to determine if the Boyne RNA projected volumes occur at Bronte Street South and Louis St. Laurent Avenue as based on the queuing analysis in the future background horizon, the currently proposed storage lengths from Boyne are not enough to accommodate the 95<sup>th</sup> percentile queues. As noted in the report, this does not necessarily result in spillback to other intersections and is primarily associated with the significant increase in background traffic. Based on the projected site volumes at this critical intersection, it is likely that resolving the issues associated with the background conditions would alleviate the queuing seen for the future total conditions.

Based on the anticipated traffic volumes and overall site context, an all-way stop-control intersection is being proposed and recommended at the intersection of Street 'B' and Street 'D' / Street 'C' in replacement of the previously proposed roundabout control. This revised intersection control is expected to better accommodate the anticipated traffic patterns and improve active transportation connectivity and safety.

The Draft Plan currently proposes a robust active transportation network both in the development blocks and the proposed parkland. This includes an active transportation link over the CN Rail line which allows for pedestrian and cyclist to cross the tracks without having to go to Louis St. Laurent Avenue.

The recommended Transportation Demand Management measures for the proposed development would be implemented at all levels to help encourage non-auto travel modes. It is noted that TDM measures do not work in isolation, but would be implemented to provide an overall shift in behavioural change towards encouraging and supporting non-auto travel modes. These work to provide many benefits to the community such as creating a more livable environment, reducing greenhouse gas emissions, reducing traffic congestions and improving the overall commuter experience.

It is also noted that the exact impact of TDM measures would fluctuate and vary depending on the success of implementation.

# **Appendix A:**

## Town of Milton Correspondence

## Jessica Deng

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**From:** Chris.Toews@milton.ca  
**Sent:** Tuesday, June 3, 2025 8:19 AM  
**To:** Jessica Deng  
**Cc:** Michael Dowdall  
**Subject:** RE: Follow-Up on Voicemail - Fieldgate East SMUN Lands TIS Update Clarification

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Good morning Jessica,

Sorry I missed your call. See below Transportation Planning staff's responses overlaid onto your email, **in red**.

Feel free to let me know if you have any other questions.

Kind regards,  
Chris



**Chris Toews**  
Transportation Planning Technologist  
150 Mary Street., Milton ON, L9T 6Z5  
905-878-7252 ext. 2502  
[www.milton.ca](http://www.milton.ca)

Confidentiality notice: This message and any attachments are intended only for the recipient named above. This message may contain confidential or personal information that may be subject to the Municipal Freedom of Information Act and must not be distributed or disclosed to unauthorized persons. If you received this message in error, please notify the sender immediately. Thank you for your assistance.

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**From:** Jessica Deng <jessica.deng@tylin.com>  
**Sent:** Monday, June 2, 2025 4:10 PM  
**To:** Chris Toews <Chris.Toews@milton.ca>  
**Cc:** Michael Dowdall <michael.dowdall@tylin.com>  
**Subject:** Follow-Up on Voicemail - Fieldgate East SMUN Lands TIS Update Clarification

Hi Chris,

I hope you are doing well. I gave you a call and left a voicemail earlier this afternoon regarding the Fieldgate East SMUN Lands development located at Louis St. Laurent Avenue and Bronte Street South. We are looking to update our TIS to reflect the latest plans and wanted to confirm/finalize some traffic assumptions and what approach we should be taking as we begin our updates.

In our previous TIS submission that was submitted in April 2022, we used 2019 turning movement counts (which were grown to 2021 baseline traffic volumes) and assumed a 2026 horizon year, which aligned

with the 2017 Boyne Secondary Plan Survey Area Road Network Assessment and was supported by the Town and Region during pre-consultation. Since this will be an update to the previous TIS, we're hoping the Town can confirm and comment on the following:

- Can we continue to use the methodology from the previous April 2022 TIS submission, which is using the 2019 TMCs (grown to 2021 baseline traffic volumes) with a 2026 horizon year? – **As the 2019 TMC counts are now +5 years old, we request that new TMC data is collected/analyzed for the updated report.**  
**Regarding the horizon year scenario, the report should reflect the anticipated timing of construction. Given construction timing has now changed, we request that a 2032 horizon year scenario is now considered (5-years post buildout).**
- If a later horizon year is required, would it be acceptable to apply the same growth rates from the previous TIS to the 2019 TMCs to establish an updated baseline year (e.g., 2025)? – **Yes, you may apply the same growth rates along Louis St. Laurent Avenue, and Bronte Street South as noted below.**

For reference, the growth rates used in the previous TIS submission are:

- 2.45% along Louis St. Laurent Avenue
- 3.00% along Bronte Street South

Please let us know how you'd like us to proceed.

Regards,

**Jessica Deng**

TRANSPORTATION DESIGNER

T +1 905.738.4256

[jessica.deng@tylin.com](mailto:jessica.deng@tylin.com)

**TYLin**

Suite 315

3381 Steeles Avenue East

Toronto, ON M2H 3S7, Canada

**TYLin.com**



# **Appendix B:**

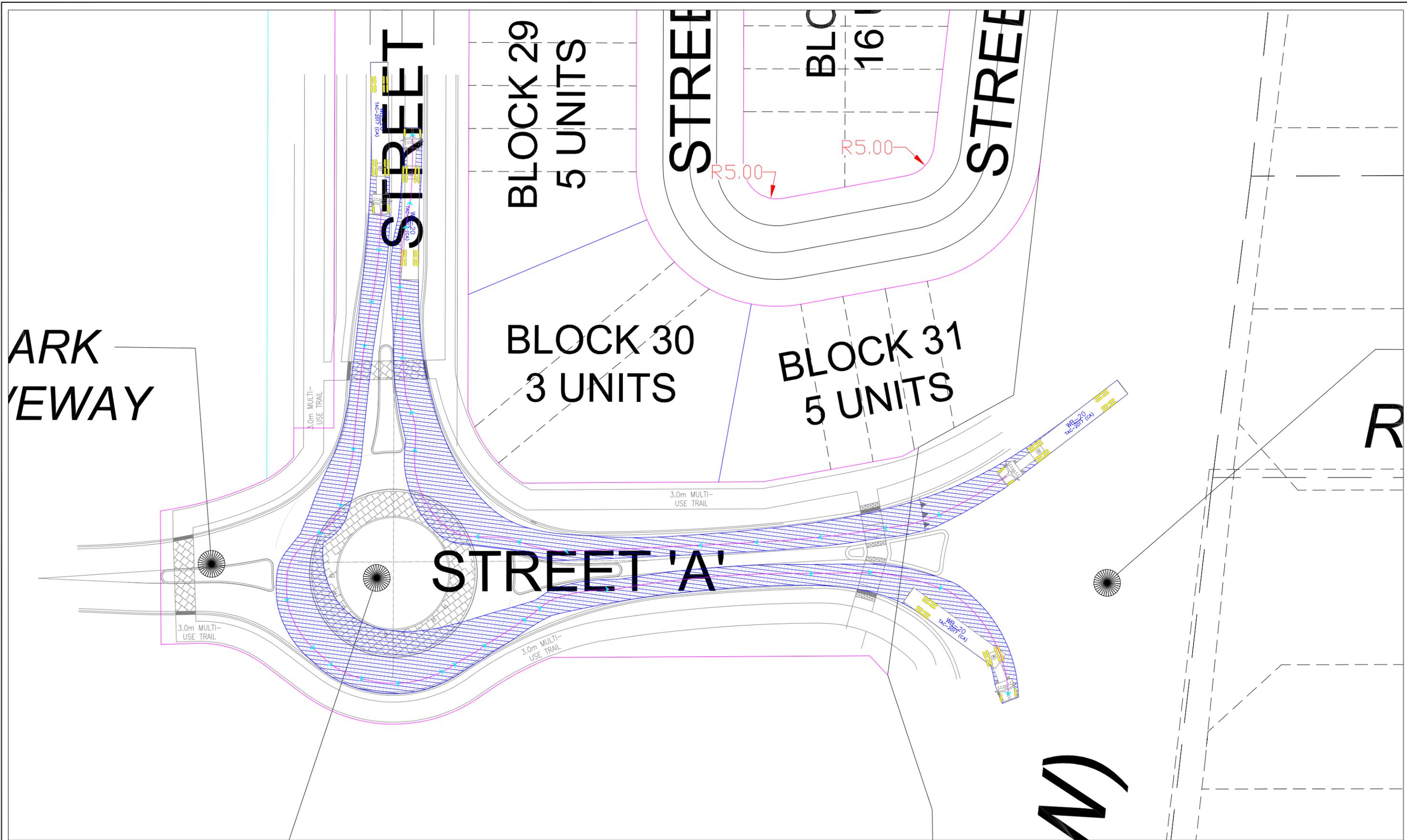
## Draft Plan



# **Appendix C:**

## Road Network Review

C:\Projects\2022\10709 - Fieldgate - SMUN Block 1 TIS03 Analysis03 Site Review & Circulation\20250610



3381 Steeles Ave. East,  
Suite 315  
Toronto, ON  
M2H 3S8  
P: 905.738.5700

FIELDGATE EAST SMUN LANDS  
VEHICLE MANEUVERING DIAGRAMS  
WB-20 TRAILER



PROJECT No.  
**10709**  
SCALE:  
**NTS**

DRAWING No.  
**01**  
DATE  
**JUNE 2025**

**LEGEND**

 "Zone" Along Bronte Street South  
for Right-In / Right-out Access



File: C:\Transportation Services\01 Staff Folders\Brahman\SMUN\BricIs6.5x11\_ITL-landscape.dwg. Layout: Figure 1-1 Date: May 03, 2024 - 3:42pm. Edit By: STRAHMAN

**TMIG**  
INTERNATIONAL COMPANY

8800 Dufferin Street,  
Suite 200  
Vaughan, ON  
L4K 0C5  
p: 905.738.5700  
f: 905.738.0065

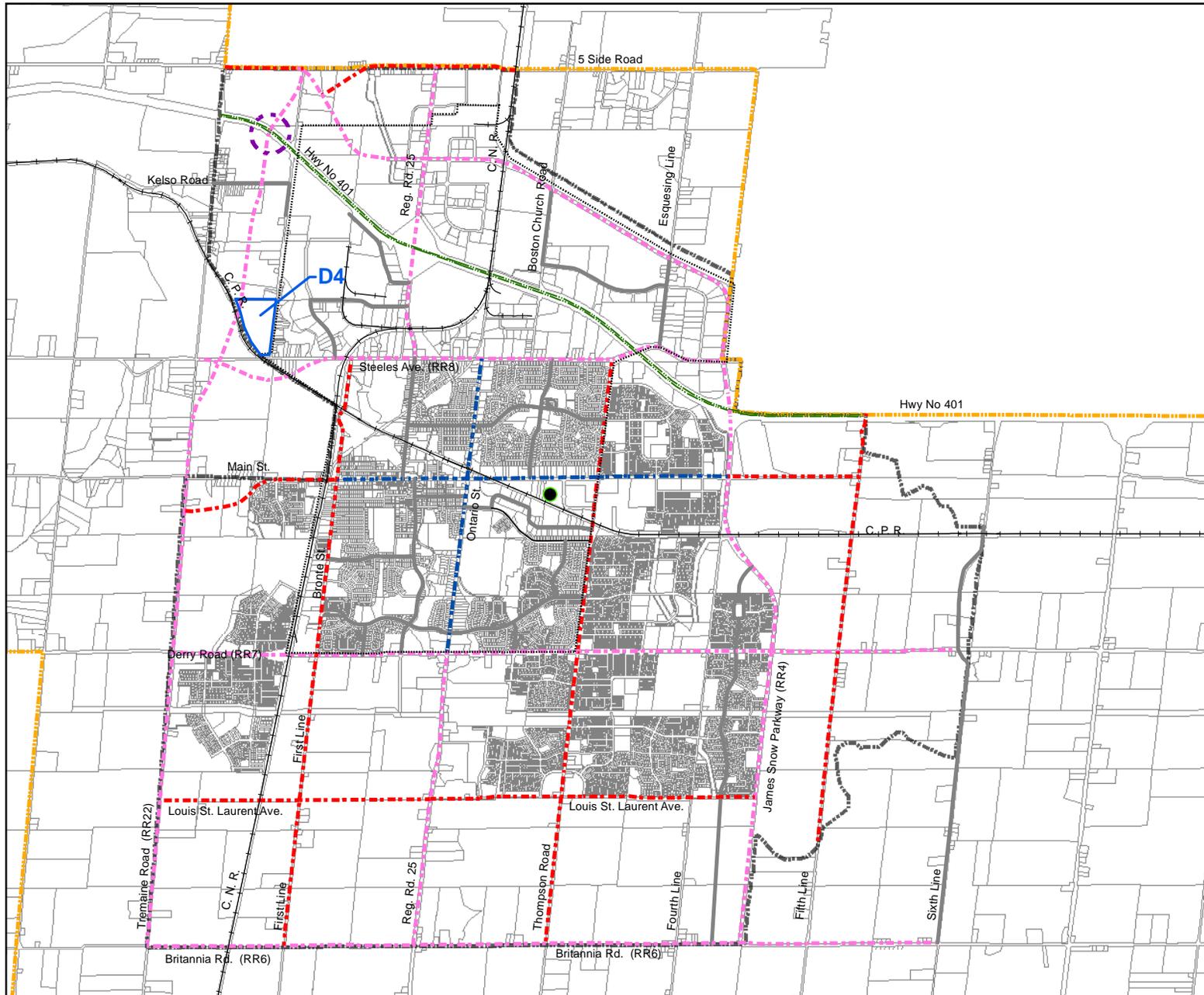
Right-in / Right-out Access Zone  
Fieldgate Secondary Mixed-Use Node (SMUN) Lands  
Transportation Impact Study

DATE: April 2022	PROJECT No. 09102
SCALE: NTS	DRAWING No.

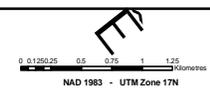
**Appendix D:**  
Schedule F from Town of Milton  
Official Plan

# TOWN OF MILTON OFFICIAL PLAN

## Schedule F Urban Area Transportation Plan



- - - - - TOWN OF MILTON BOUNDARY
- + + + + + RAILWAY
- - - - - URBAN EXPANSION AREA
- — — — — COLLECTOR
- — — — — LOCAL
- - - - - MAJOR ARTERIAL
- - - - - MINOR ARTERIAL
- - - - - MULTI-PURPOSE ARTERIAL
- ( ) ( ) ( ) ( ) PLANNED 401 INTERCHANGE
- - - - - PROVINCIAL FREEWAY
- — — — — DEFERRED AREAS
- - - - - EXISTING URBAN AREA
- COMMUTER RAIL STATION



This Schedule Forms Part Of The  
Official Plan And Should Be Read  
Together With The Text.  
(C) Copyright Teranet, Town of Milton 2008

Consolidated August 2008

# **Appendix E:**

## Existing Traffic Data

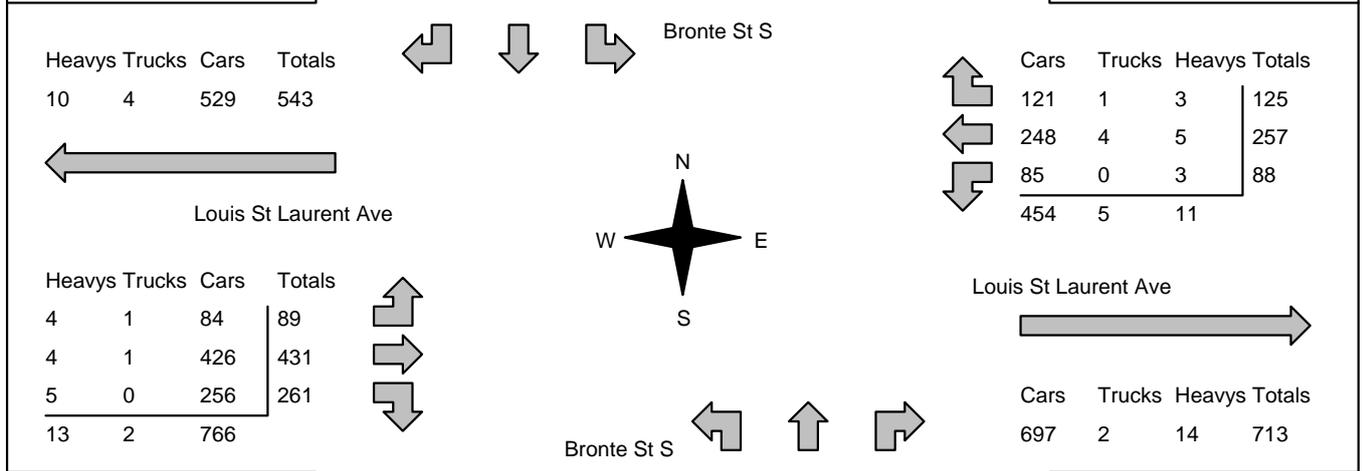
# Accu-Traffic Inc.

<b>Morning Peak Diagram</b>	<b>Specified Period</b> <b>From:</b> 6:30:00 <b>To:</b> 10:00:00	<b>One Hour Peak</b> <b>From:</b> 8:00:00 <b>To:</b> 9:00:00
-----------------------------	------------------------------------------------------------------------	--------------------------------------------------------------------

<b>Municipality:</b> Milton <b>Site #:</b> 2509200002 <b>Intersection:</b> Louis St Laurent Ave & Bronte St S <b>TFR File #:</b> 1 <b>Count date:</b> 11-Jun-25	<b>Weather conditions:</b>  <b>Person counted:</b> <b>Person prepared:</b> <b>Person checked:</b>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------

<b>** Signalized Intersection **</b>	<b>Major Road:</b> Louis St Laurent Ave runs W/E
--------------------------------------	--------------------------------------------------

North Leg Total: 1262 North Entering: 652 North Peds: 33 Peds Cross: ☒	<table style="border-collapse: collapse;"> <tr><td>Heavys</td><td>1</td><td>13</td><td>8</td><td>22</td></tr> <tr><td>Trucks</td><td>0</td><td>5</td><td>0</td><td>5</td></tr> <tr><td>Cars</td><td>68</td><td>381</td><td>176</td><td>625</td></tr> <tr><td>Totals</td><td>69</td><td>399</td><td>184</td><td></td></tr> </table>	Heavys	1	13	8	22	Trucks	0	5	0	5	Cars	68	381	176	625	Totals	69	399	184			<table style="border-collapse: collapse;"> <tr><td>Heavys</td><td>17</td></tr> <tr><td>Trucks</td><td>3</td></tr> <tr><td>Cars</td><td>590</td></tr> <tr><td>Totals</td><td>610</td></tr> </table>	Heavys	17	Trucks	3	Cars	590	Totals	610	East Leg Total: 1183 East Entering: 470 East Peds: 106 Peds Cross: ☒
Heavys	1	13	8	22																												
Trucks	0	5	0	5																												
Cars	68	381	176	625																												
Totals	69	399	184																													
Heavys	17																															
Trucks	3																															
Cars	590																															
Totals	610																															



Peds Cross: ☒ West Peds: 48 West Entering: 781 West Leg Total: 1324	<table style="border-collapse: collapse;"> <tr><td>Cars</td><td>722</td></tr> <tr><td>Trucks</td><td>5</td></tr> <tr><td>Heavys</td><td>21</td></tr> <tr><td>Totals</td><td>748</td></tr> </table>	Cars	722	Trucks	5	Heavys	21	Totals	748		<table style="border-collapse: collapse;"> <tr><td>Cars</td><td>213</td><td>385</td><td>95</td><td>693</td></tr> <tr><td>Trucks</td><td>0</td><td>1</td><td>1</td><td>2</td></tr> <tr><td>Heavys</td><td>4</td><td>10</td><td>2</td><td>16</td></tr> <tr><td>Totals</td><td>217</td><td>396</td><td>98</td><td></td></tr> </table>	Cars	213	385	95	693	Trucks	0	1	1	2	Heavys	4	10	2	16	Totals	217	396	98		Peds Cross: ☒ South Peds: 59 South Entering: 711 South Leg Total: 1459
Cars	722																															
Trucks	5																															
Heavys	21																															
Totals	748																															
Cars	213	385	95	693																												
Trucks	0	1	1	2																												
Heavys	4	10	2	16																												
Totals	217	396	98																													

**Comments**

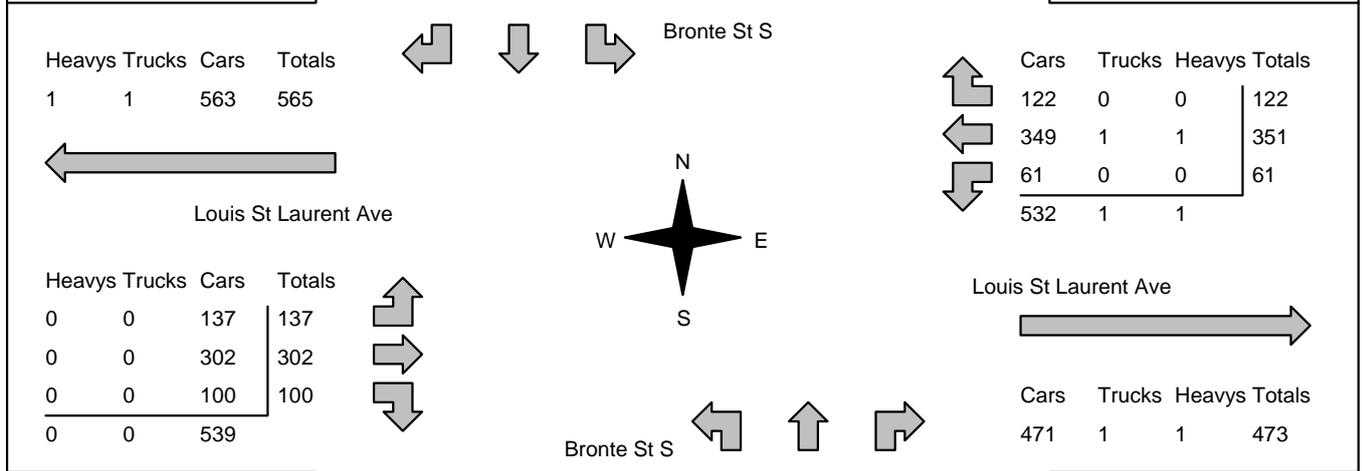
# Accu-Traffic Inc.

<b>Afternoon Peak Diagram</b>	<b>Specified Period</b> <b>From:</b> 16:00:00 <b>To:</b> 19:00:00	<b>One Hour Peak</b> <b>From:</b> 17:15:00 <b>To:</b> 18:15:00
-------------------------------	-------------------------------------------------------------------------	----------------------------------------------------------------------

<b>Municipality:</b> Milton <b>Site #:</b> 2509200002 <b>Intersection:</b> Louis St Laurent Ave & Bronte St S <b>TFR File #:</b> 1 <b>Count date:</b> 11-Jun-25	<b>Weather conditions:</b>  <b>Person counted:</b> <b>Person prepared:</b> <b>Person checked:</b>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------

<b>** Signalized Intersection **</b>	<b>Major Road:</b> Louis St Laurent Ave runs W/E
--------------------------------------	--------------------------------------------------

North Leg Total: 1102 North Entering: 468 North Peds: 8 Peds Cross: $\boxtimes$	<table style="border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>Cars</td><td>63</td><td>262</td><td>141</td><td>466</td></tr> <tr><td>Totals</td><td>63</td><td>262</td><td>143</td><td></td></tr> </table>	Heavys	0	0	1	1	Trucks	0	0	1	1	Cars	63	262	141	466	Totals	63	262	143			<table style="border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Trucks</td><td>1</td></tr> <tr><td>Cars</td><td>633</td></tr> <tr><td>Totals</td><td>634</td></tr> </table>	Heavys	0	Trucks	1	Cars	633	Totals	634	East Leg Total: 1007 East Entering: 534 East Peds: 15 Peds Cross: $\boxtimes$
Heavys	0	0	1	1																												
Trucks	0	0	1	1																												
Cars	63	262	141	466																												
Totals	63	262	143																													
Heavys	0																															
Trucks	1																															
Cars	633																															
Totals	634																															



Peds Cross: $\boxtimes$ West Peds: 5 West Entering: 539 West Leg Total: 1104	<table style="border-collapse: collapse;"> <tr><td>Cars</td><td>423</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Totals</td><td>423</td></tr> </table>	Cars	423	Trucks	0	Heavys	0	Totals	423		<table style="border-collapse: collapse;"> <tr><td>Cars</td><td>151</td><td>374</td><td>28</td><td>553</td></tr> <tr><td>Trucks</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>151</td><td>375</td><td>28</td><td></td></tr> </table>	Cars	151	374	28	553	Trucks	0	1	0	1	Heavys	0	0	0	0	Totals	151	375	28		Peds Cross: $\boxtimes$ South Peds: 2 South Entering: 554 South Leg Total: 977
Cars	423																															
Trucks	0																															
Heavys	0																															
Totals	423																															
Cars	151	374	28	553																												
Trucks	0	1	0	1																												
Heavys	0	0	0	0																												
Totals	151	375	28																													

## Comments

# Accu-Traffic Inc.

## Total Count Diagram

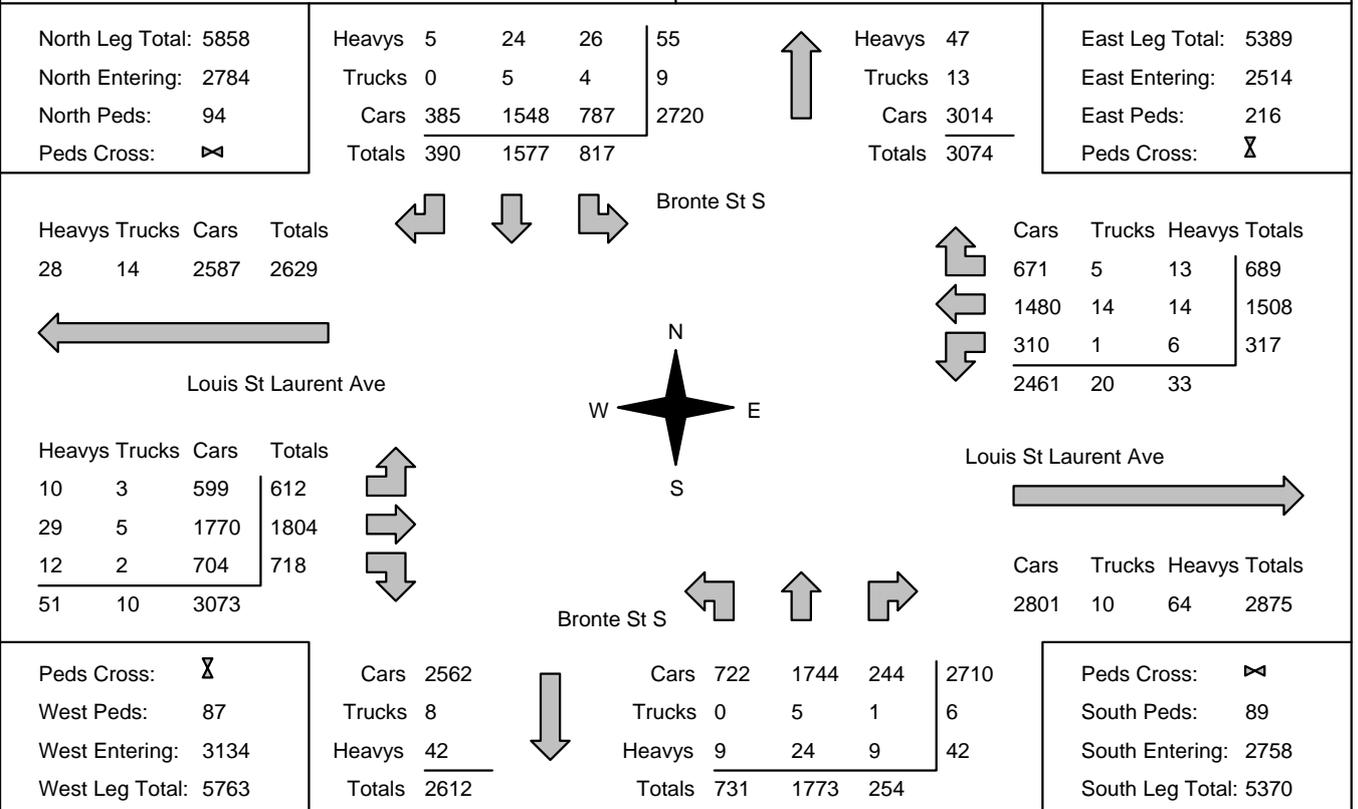
**Municipality:** Milton  
**Site #:** 2509200002  
**Intersection:** Louis St Laurent Ave & Bronte St S  
**TFR File #:** 1  
**Count date:** 11-Jun-25

**Weather conditions:**

**Person counted:**  
**Person prepared:**  
**Person checked:**

**\*\* Signalized Intersection \*\***

**Major Road:** Louis St Laurent Ave runs W/E



### Comments



**Accu-Traffic Inc.**  
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Traffic Count Summary

Intersection: Louis St Laurent Ave & Bronte St      Count Date: 11-Jun-25      Municipality: Milton

<b>North Approach Totals</b>						North/South Total Approaches	<b>South Approach Totals</b>					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	19	59	19	97	2	135	7:00:00	7	31	0	38	1
8:00:00	92	200	33	325	8	543	8:00:00	60	134	24	218	6
9:00:00	184	399	69	652	33	1363	9:00:00	217	396	98	711	59
10:00:00	126	199	51	376	11	775	10:00:00	61	270	68	399	13
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	125	239	87	451	18	893	17:00:00	120	307	15	442	2
18:00:00	136	243	63	442	9	988	18:00:00	153	368	25	546	2
19:00:00	135	238	68	441	13	845	19:00:00	113	267	24	404	6
<b>Totals:</b>	<b>817</b>	<b>1577</b>	<b>390</b>	<b>2784</b>	<b>94</b>	<b>5542</b>	<b>S Totals:</b>	<b>731</b>	<b>1773</b>	<b>254</b>	<b>2758</b>	<b>89</b>
<b>East Approach Totals</b>						East/West Total Approaches	<b>West Approach Totals</b>					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	2	27	17	46	2	162	7:00:00	14	65	37	116	0
8:00:00	27	106	48	181	10	584	8:00:00	49	245	109	403	6
9:00:00	88	257	125	470	106	1251	9:00:00	89	431	261	781	48
10:00:00	37	168	118	323	50	706	10:00:00	73	230	80	383	9
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	39	289	137	465	8	915	17:00:00	130	252	68	450	9
18:00:00	62	361	118	541	17	1077	18:00:00	138	314	84	536	5
19:00:00	62	300	126	488	23	953	19:00:00	119	267	79	465	10
<b>Totals:</b>	<b>317</b>	<b>1508</b>	<b>689</b>	<b>2514</b>	<b>216</b>	<b>5648</b>	<b>W Totals:</b>	<b>612</b>	<b>1804</b>	<b>718</b>	<b>3134</b>	<b>87</b>
<b>Calculated Values for Traffic Crossing Major Street</b>												
Hours Ending:	7:00	8:00	9:00	10:00		16:00	17:00	18:00	19:00			
Crossing Values:	87	368	954	516		0	569	679	548			



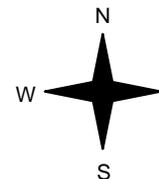






# Accu-Traffic Inc.

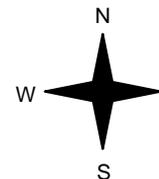
<b>Morning Peak Diagram</b>	<b>Specified Period</b> <b>From:</b> 6:30:00 <b>To:</b> 10:00:00	<b>One Hour Peak</b> <b>From:</b> 8:15:00 <b>To:</b> 9:15:00
<b>Municipality:</b> Milton <b>Site #:</b> 2509200003 <b>Intersection:</b> Bronte St S & Whitlock Ave <b>TFR File #:</b> 1 <b>Count date:</b> 11-Jun-25	<b>Weather conditions:</b>  <b>Person counted:</b> <b>Person prepared:</b> <b>Person checked:</b>	
<b>** Non-Signalized Intersection **</b>	<b>Major Road:</b> Bronte St S runs N/S	

North Leg Total: 1410 North Entering: 698 North Peds: 3 Peds Cross: ☒	<table style="margin: auto;"> <tr> <td style="padding: 2px;">Heavys</td><td style="padding: 2px;">12</td><td style="padding: 2px;">11</td><td style="padding: 2px;">23</td><td style="padding: 2px;">↑</td><td style="padding: 2px;">Heavys</td><td style="padding: 2px;">16</td></tr> <tr> <td style="padding: 2px;">Trucks</td><td style="padding: 2px;">2</td><td style="padding: 2px;">1</td><td style="padding: 2px;">3</td><td></td><td style="padding: 2px;">Trucks</td><td style="padding: 2px;">1</td></tr> <tr> <td style="padding: 2px;">Cars</td><td style="padding: 2px;">581</td><td style="padding: 2px;">91</td><td style="padding: 2px;">672</td><td></td><td style="padding: 2px;">Cars</td><td style="padding: 2px;">695</td></tr> <tr> <td style="padding: 2px;">Totals</td><td style="padding: 2px;">595</td><td style="padding: 2px;">103</td><td></td><td></td><td style="padding: 2px;">Totals</td><td style="padding: 2px;">712</td></tr> </table> <p style="text-align: center;">Bronte St S</p>  <p style="text-align: center;">Bronte St S</p> <table style="margin: auto;"> <tr> <td style="padding: 2px;">Cars</td><td style="padding: 2px;">673</td><td style="padding: 2px;">Cars</td><td style="padding: 2px;">537</td><td style="padding: 2px;">72</td><td style="padding: 2px;">609</td></tr> <tr> <td style="padding: 2px;">Trucks</td><td style="padding: 2px;">2</td><td style="padding: 2px;">Trucks</td><td style="padding: 2px;">1</td><td style="padding: 2px;">0</td><td style="padding: 2px;">1</td></tr> <tr> <td style="padding: 2px;">Heavys</td><td style="padding: 2px;">14</td><td style="padding: 2px;">Heavys</td><td style="padding: 2px;">8</td><td style="padding: 2px;">0</td><td style="padding: 2px;">8</td></tr> <tr> <td style="padding: 2px;">Totals</td><td style="padding: 2px;">689</td><td style="padding: 2px;">Totals</td><td style="padding: 2px;">546</td><td style="padding: 2px;">72</td><td></td></tr> </table>	Heavys	12	11	23	↑	Heavys	16	Trucks	2	1	3		Trucks	1	Cars	581	91	672		Cars	695	Totals	595	103			Totals	712	Cars	673	Cars	537	72	609	Trucks	2	Trucks	1	0	1	Heavys	14	Heavys	8	0	8	Totals	689	Totals	546	72		<table style="margin: auto;"> <tr> <td style="padding: 2px;">East Leg Total:</td><td style="padding: 2px;">435</td></tr> <tr> <td style="padding: 2px;">East Entering:</td><td style="padding: 2px;">260</td></tr> <tr> <td style="padding: 2px;">East Peds:</td><td style="padding: 2px;">63</td></tr> <tr> <td style="padding: 2px;">Peds Cross:</td><td style="padding: 2px;">☒</td></tr> </table> <table style="margin: auto;"> <tr> <td style="padding: 2px;">Cars</td><td style="padding: 2px;">Trucks</td><td style="padding: 2px;">Heavys</td><td style="padding: 2px;">Totals</td></tr> <tr> <td style="padding: 2px;">158</td><td style="padding: 2px;">0</td><td style="padding: 2px;">8</td><td style="padding: 2px;">166</td></tr> <tr> <td style="padding: 2px;">92</td><td style="padding: 2px;">0</td><td style="padding: 2px;">2</td><td style="padding: 2px;">94</td></tr> <tr> <td style="padding: 2px;">250</td><td style="padding: 2px;">0</td><td style="padding: 2px;">10</td><td></td></tr> </table> <p style="text-align: center;">Whitlock Ave</p> <table style="margin: auto;"> <tr> <td style="padding: 2px;">Cars</td><td style="padding: 2px;">Trucks</td><td style="padding: 2px;">Heavys</td><td style="padding: 2px;">Totals</td></tr> <tr> <td style="padding: 2px;">163</td><td style="padding: 2px;">1</td><td style="padding: 2px;">11</td><td style="padding: 2px;">175</td></tr> </table>	East Leg Total:	435	East Entering:	260	East Peds:	63	Peds Cross:	☒	Cars	Trucks	Heavys	Totals	158	0	8	166	92	0	2	94	250	0	10		Cars	Trucks	Heavys	Totals	163	1	11	175
Heavys	12	11	23	↑	Heavys	16																																																																																
Trucks	2	1	3		Trucks	1																																																																																
Cars	581	91	672		Cars	695																																																																																
Totals	595	103			Totals	712																																																																																
Cars	673	Cars	537	72	609																																																																																	
Trucks	2	Trucks	1	0	1																																																																																	
Heavys	14	Heavys	8	0	8																																																																																	
Totals	689	Totals	546	72																																																																																		
East Leg Total:	435																																																																																					
East Entering:	260																																																																																					
East Peds:	63																																																																																					
Peds Cross:	☒																																																																																					
Cars	Trucks	Heavys	Totals																																																																																			
158	0	8	166																																																																																			
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250	0	10																																																																																				
Cars	Trucks	Heavys	Totals																																																																																			
163	1	11	175																																																																																			
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%; padding: 2px;">Peds Cross: ☒</td> <td style="width: 30%;"></td> </tr> <tr> <td style="padding: 2px;">South Peds: 0</td> <td></td> </tr> <tr> <td style="padding: 2px;">South Entering: 618</td> <td></td> </tr> <tr> <td style="padding: 2px;">South Leg Total: 1307</td> <td></td> </tr> </table>			Peds Cross: ☒		South Peds: 0		South Entering: 618		South Leg Total: 1307																																																																													
Peds Cross: ☒																																																																																						
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South Leg Total: 1307																																																																																						

## Comments

# Accu-Traffic Inc.

<b>Afternoon Peak Diagram</b>	<b>Specified Period</b> <b>From:</b> 16:00:00 <b>To:</b> 19:00:00	<b>One Hour Peak</b> <b>From:</b> 17:15:00 <b>To:</b> 18:15:00
<b>Municipality:</b> Milton <b>Site #:</b> 2509200003 <b>Intersection:</b> Bronte St S & Whitlock Ave <b>TFR File #:</b> 1 <b>Count date:</b> 11-Jun-25	<b>Weather conditions:</b>  <b>Person counted:</b> <b>Person prepared:</b> <b>Person checked:</b>	
<b>** Non-Signalized Intersection **</b>	<b>Major Road:</b> Bronte St S runs N/S	

North Leg Total: 965 North Entering: 414 North Peds: 2 Peds Cross: ☒	<table style="margin: auto;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td rowspan="4" style="vertical-align: middle; text-align: center;">↑</td> <td style="text-align: left;">Heavys</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Trucks</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: center;">301</td> <td style="text-align: center;">112</td> <td style="text-align: center;">413</td> <td style="text-align: left;">Cars</td> <td style="text-align: center;">550</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: center;">302</td> <td style="text-align: center;">112</td> <td style="text-align: center;">413</td> <td style="text-align: left;">Totals</td> <td style="text-align: center;">551</td> </tr> </table> <p style="text-align: center;">↓    ↘    Bronte St S</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Bronte St S    ↑    ↘</p> <table style="margin: auto;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: center;">322</td> <td style="text-align: right;">Cars</td> <td style="text-align: center;">430</td> <td style="text-align: center;">20</td> <td style="text-align: center;">450</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: center;">1</td> 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</tr> <tr> <td style="text-align: right;">Peds Cross:</td> <td style="text-align: center;">☒</td> </tr> </table> <table style="margin: auto;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: center;">120</td> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: right;">Heavys</td> <td style="text-align: center;">0</td> <td style="text-align: center;">120</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: center;">0</td> <td style="text-align: right;">Heavys</td> <td style="text-align: center;">0</td> <td style="text-align: right;">Heavys</td> <td style="text-align: center;">0</td> <td 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Entering:	141	East Peds:	24	Peds Cross:	☒	Cars	120	Trucks	0	Heavys	0	120	Trucks	0	Trucks	0	Trucks	0	0	Heavys	0	Heavys	0	Heavys	0	0	Totals	120	Totals	0	Totals	0	0	Cars	21	Trucks	0	Heavys	0	21	Trucks	0	Trucks	0	Trucks	0	0	Heavys	0	Heavys	0	Heavys	0	0	Totals	21	Totals	0	Totals	0	0	Cars	132	Trucks	0	Heavys	0	132	Trucks	0	Trucks	0	Trucks	0	0	Heavys	0	Heavys	0	Heavys	0	0	Totals	132	Totals	0	Totals	0	0
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## Comments

# Accu-Traffic Inc.

## Total Count Diagram

**Municipality:** Milton  
**Site #:** 2509200003  
**Intersection:** Bronte St S & Whitlock Ave  
**TFR File #:** 1  
**Count date:** 11-Jun-25

**Weather conditions:**

**Person counted:**  
**Person prepared:**  
**Person checked:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Bronte St S runs N/S

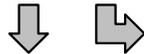
North Leg Total: 5270  
 North Entering: 2541  
 North Peds: 11  
 Peds Cross:

Heavys	22	20	42
Trucks	4	2	6
Cars	2053	440	2493
<b>Totals</b>	<b>2079</b>	<b>462</b>	

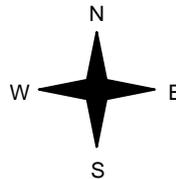


Heavys	33
Trucks	5
Cars	2691
<b>Totals</b>	<b>2729</b>

East Leg Total: 1531  
 East Entering: 881  
 East Peds: 173  
 Peds Cross:



Bronte St S



Cars	Trucks	Heavys	Totals
631	0	12	643



229	0	9	238
<b>860</b>	<b>0</b>	<b>21</b>	

Whitlock Ave



Bronte St S



Cars	Trucks	Heavys	Totals
627	2	21	650

Cars	2282
Trucks	4
Heavys	31
<b>Totals</b>	<b>2317</b>



Cars	2060	187	2247
Trucks	5	0	5
Heavys	21	1	22
<b>Totals</b>	<b>2086</b>	<b>188</b>	

Peds Cross:   
 South Peds: 2  
 South Entering: 2274  
 South Leg Total: 4591

### Comments



**Accu-Traffic Inc.**  
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Traffic Count Summary

Intersection: Bronte St S & Whitlock Ave      Count Date: 11-Jun-25      Municipality: Milton

<b>North Approach Totals</b>						North/South Total Approaches	<b>South Approach Totals</b>					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	6	88	0	94	0	126	7:00:00	0	30	2	32	0
8:00:00	31	295	0	326	0	501	8:00:00	0	158	17	175	0
9:00:00	96	607	0	703	1	1284	9:00:00	0	508	73	581	0
10:00:00	56	251	0	307	2	634	10:00:00	0	309	18	327	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	78	271	0	349	5	730	17:00:00	0	349	32	381	2
18:00:00	99	289	0	388	2	843	18:00:00	0	429	26	455	0
19:00:00	96	278	0	374	1	697	19:00:00	0	303	20	323	0
<b>Totals:</b>	<b>462</b>	<b>2079</b>	<b>0</b>	<b>2541</b>	<b>11</b>	<b>4815</b>	<b>S Totals:</b>	<b>0</b>	<b>2086</b>	<b>188</b>	<b>2274</b>	<b>2</b>
<b>East Approach Totals</b>						East/West Total Approaches	<b>West Approach Totals</b>					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	4	0	10	14	4	14	7:00:00	0	0	0	0	0
8:00:00	23	0	58	81	10	81	8:00:00	0	0	0	0	0
9:00:00	97	0	161	258	68	258	9:00:00	0	0	0	0	0
10:00:00	37	0	96	133	28	133	10:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	34	0	97	131	12	131	17:00:00	0	0	0	0	0
18:00:00	25	0	125	150	21	150	18:00:00	0	0	0	0	0
19:00:00	18	0	96	114	30	114	19:00:00	0	0	0	0	0
<b>Totals:</b>	<b>238</b>	<b>0</b>	<b>643</b>	<b>881</b>	<b>173</b>	<b>881</b>	<b>W Totals:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Calculated Values for Traffic Crossing Major Street</b>												
Hours Ending:	7:00	8:00	9:00	10:00		16:00	17:00	18:00	19:00			
Crossing Values:	4	23	98	39		0	41	27	19			









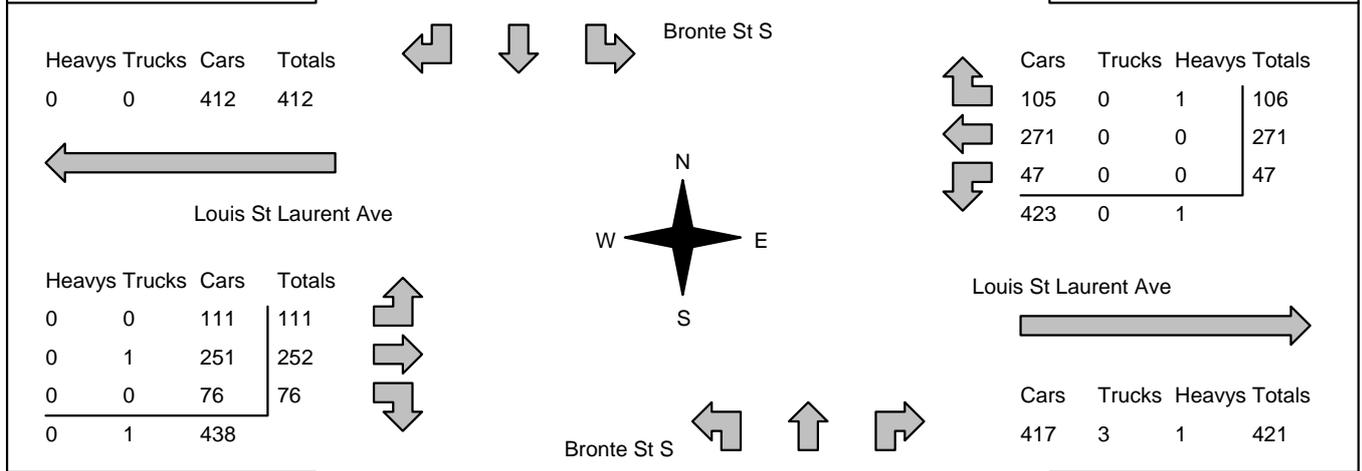
# Accu-Traffic Inc.

<b>Mid-day Peak Diagram</b>	<b>Specified Period</b> <b>From:</b> 11:00:00 <b>To:</b> 15:00:00	<b>One Hour Peak</b> <b>From:</b> 14:00:00 <b>To:</b> 15:00:00
-----------------------------	-------------------------------------------------------------------------	----------------------------------------------------------------------

<b>Municipality:</b> Milton <b>Site #:</b> 2509200002 <b>Intersection:</b> Louis St Laurent Ave & Bronte St S <b>TFR File #:</b> 1 <b>Count date:</b> 7-Jun-25	<b>Weather conditions:</b>  <b>Person counted:</b> <b>Person prepared:</b> <b>Person checked:</b>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------

<b>** Signalized Intersection **</b>	<b>Major Road:</b> Louis St Laurent Ave runs W/E
--------------------------------------	--------------------------------------------------

North Leg Total: 907 North Entering: 460 North Peds: 16 Peds Cross: $\boxtimes$	<table style="border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>2</td><td>2</td></tr> <tr><td>Cars</td><td>70</td><td>249</td><td>138</td><td>457</td></tr> <tr><td>Totals</td><td>70</td><td>249</td><td>141</td><td></td></tr> </table>	Heavys	0	0	1	1	Trucks	0	0	2	2	Cars	70	249	138	457	Totals	70	249	141			<table style="border-collapse: collapse;"> <tr><td>Heavys</td><td>1</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cars</td><td>446</td></tr> <tr><td>Totals</td><td>447</td></tr> </table>	Heavys	1	Trucks	0	Cars	446	Totals	447	East Leg Total: 845 East Entering: 424 East Peds: 10 Peds Cross: $\boxtimes$
Heavys	0	0	1	1																												
Trucks	0	0	2	2																												
Cars	70	249	138	457																												
Totals	70	249	141																													
Heavys	1																															
Trucks	0																															
Cars	446																															
Totals	447																															



Peds Cross: $\boxtimes$ West Peds: 4 West Entering: 439 West Leg Total: 851	<table style="border-collapse: collapse;"> <tr><td>Cars</td><td>372</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Heavys</td><td>0</td></tr> <tr><td>Totals</td><td>372</td></tr> </table>	Cars	372	Trucks	0	Heavys	0	Totals	372		<table style="border-collapse: collapse;"> <tr><td>Cars</td><td>71</td><td>230</td><td>28</td><td>329</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>71</td><td>230</td><td>28</td><td></td></tr> </table>	Cars	71	230	28	329	Trucks	0	0	0	0	Heavys	0	0	0	0	Totals	71	230	28		Peds Cross: $\boxtimes$ South Peds: 5 South Entering: 329 South Leg Total: 701
Cars	372																															
Trucks	0																															
Heavys	0																															
Totals	372																															
Cars	71	230	28	329																												
Trucks	0	0	0	0																												
Heavys	0	0	0	0																												
Totals	71	230	28																													

**Comments**

# Accu-Traffic Inc.

## Total Count Diagram

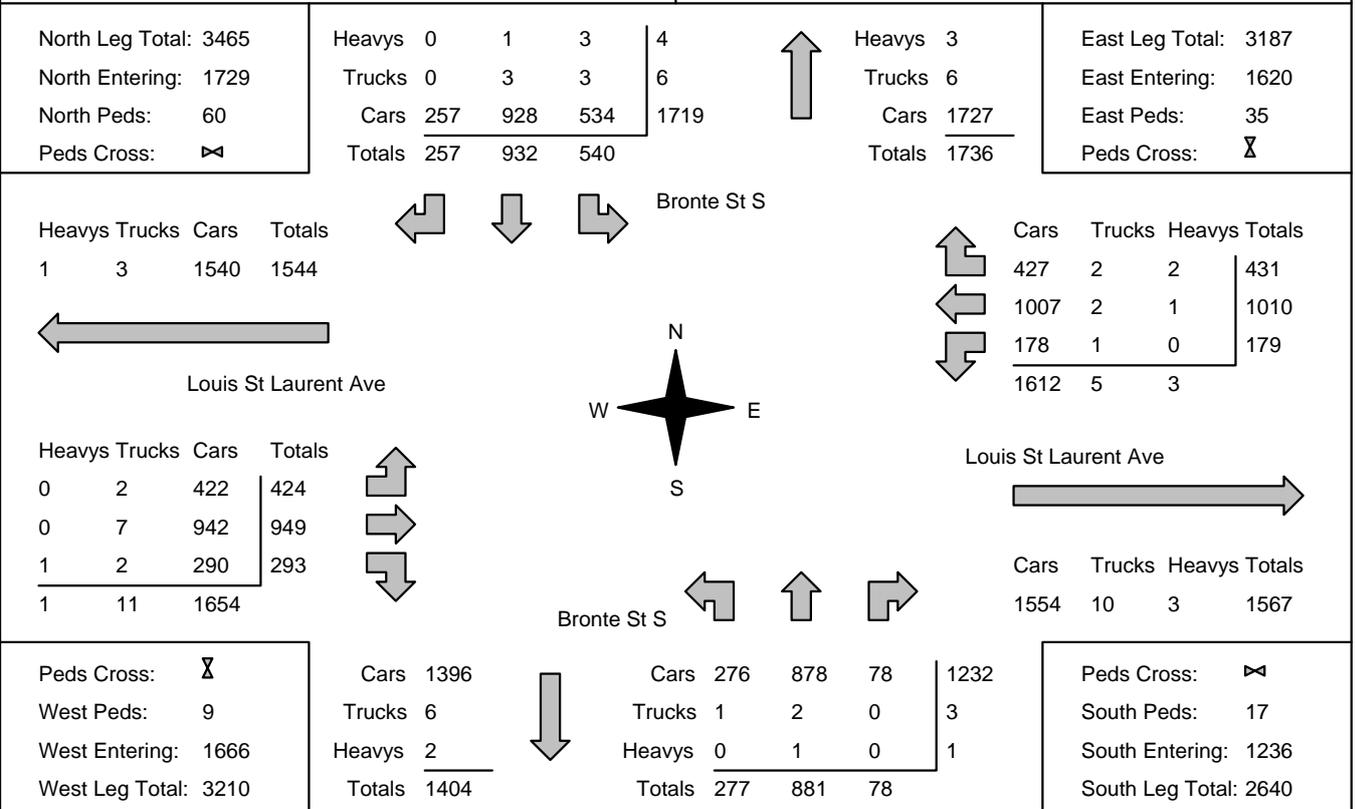
**Municipality:** Milton  
**Site #:** 2509200002  
**Intersection:** Louis St Laurent Ave & Bronte St S  
**TFR File #:** 1  
**Count date:** 7-Jun-25

**Weather conditions:**

**Person counted:**  
**Person prepared:**  
**Person checked:**

**\*\* Signalized Intersection \*\***

**Major Road:** Louis St Laurent Ave runs W/E



### Comments



**Accu-Traffic Inc.**  
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc. Traffic Count Summary

Intersection: Louis St Laurent Ave & Bronte St      Count Date: 7-Jun-25      Municipality: Milton

North Approach Totals						North/South Total Approaches	South Approach Totals						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total		
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0	
12:00:00	121	206	70	397	13	691	12:00:00	57	221	16	294	2	
13:00:00	148	249	58	455	15	747	13:00:00	68	205	19	292	3	
14:00:00	130	228	59	417	16	738	14:00:00	81	225	15	321	7	
15:00:00	141	249	70	460	16	789	15:00:00	71	230	28	329	5	
Totals:						2965	S Totals:						17
East Approach Totals						East/West Total Approaches	West Approach Totals						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total		
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0	
12:00:00	35	242	108	385	9	769	12:00:00	92	225	67	384	1	
13:00:00	56	260	115	431	12	843	13:00:00	109	225	78	412	1	
14:00:00	41	237	102	380	4	811	14:00:00	112	247	72	431	3	
15:00:00	47	271	106	424	10	863	15:00:00	111	252	76	439	4	
Totals:						3286	W Totals:						9
<b>Calculated Values for Traffic Crossing Major Street</b>													
Hours Ending:	11:00	12:00	13:00	14:00		15:00	0:00	0:00	0:00				
Crossing Values:	0	409	478	446		475	0	0	0				







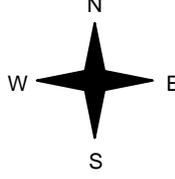
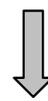


# Accu-Traffic Inc.

<b>Mid-day Peak Diagram</b>	<b>Specified Period</b> <b>From:</b> 11:00:00 <b>To:</b> 15:00:00	<b>One Hour Peak</b> <b>From:</b> 14:00:00 <b>To:</b> 15:00:00
-----------------------------	-------------------------------------------------------------------------	----------------------------------------------------------------------

<b>Municipality:</b> Milton <b>Site #:</b> 2509200003 <b>Intersection:</b> Bronte St S & Whitlock Ave <b>TFR File #:</b> 1 <b>Count date:</b> 7-Jun-25	<b>Weather conditions:</b>  <b>Person counted:</b> <b>Person prepared:</b> <b>Person checked:</b>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------

<b>** Non-Signalized Intersection **</b>	<b>Major Road:</b> Bronte St S runs N/S
------------------------------------------	-----------------------------------------

North Leg Total: 693 North Entering: 366 North Peds: 0 Peds Cross: ☒	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Heavys</td> <td style="width: 10%;">0</td> <td style="width: 10%;">0</td> <td style="width: 10%;">0</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td>Trucks</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cars</td> <td>294</td> <td>72</td> <td>366</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Totals</b></td> <td><b>294</b></td> <td><b>72</b></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">    </div> <div style="text-align: center;"> <b>Bronte St S</b> </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: center; align-items: center;"> <div style="text-align: center; margin-right: 20px;">  </div> <div style="text-align: center;"> <b>Whitlock Ave</b>   </div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <b>Bronte St S</b> </div> <div style="text-align: center;">    </div> </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Cars</td> <td style="width: 10%;">312</td> <td style="width: 10%;"></td> </tr> <tr> <td>Trucks</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Heavys</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Totals</b></td> <td><b>313</b></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Cars</td> <td style="width: 10%;">261</td> <td style="width: 10%;">16</td> <td style="width: 10%;">277</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td>Trucks</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Heavys</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Totals</b></td> <td><b>261</b></td> <td><b>16</b></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Heavys	0	0	0					Trucks	0	0	0					Cars	294	72	366					<b>Totals</b>	<b>294</b>	<b>72</b>						Cars	312							Trucks	1							Heavys	0							<b>Totals</b>	<b>313</b>							Cars	261	16	277					Trucks	0	0	0					Heavys	0	0	0					<b>Totals</b>	<b>261</b>	<b>16</b>						<table style="width: 100%; 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border-collapse: collapse;"> <tr> <td style="width: 30%;">Peds Cross:</td> <td style="width: 10%;">☒</td> <td style="width: 10%;"></td> </tr> <tr> <td>South Peds:</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>South Entering:</td> <td>277</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>South Leg Total:</b></td> <td><b>590</b></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Heavys	0	0	0					Trucks	0	0	0					Cars	327							<b>Totals</b>	<b>327</b>							Cars	66	0	0	66				Trucks	0	0	0					Heavys	0	0	0					<b>Totals</b>	<b>66</b>							Cars	18	1	0	19				Trucks	0	0	0					Heavys	0	0	0					<b>Totals</b>	<b>18</b>	<b>1</b>	<b>0</b>					Cars	88	0	0	88				Trucks	0	0	0					Heavys	0	0	0					<b>Totals</b>	<b>88</b>							Peds Cross:	☒							South Peds:	0							South Entering:	277							<b>South Leg Total:</b>	<b>590</b>						
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## Comments

# Accu-Traffic Inc.

## Total Count Diagram

**Municipality:** Milton  
**Site #:** 2509200003  
**Intersection:** Bronte St S & Whitlock Ave  
**TFR File #:** 1  
**Count date:** 7-Jun-25

**Weather conditions:**

**Person counted:**  
**Person prepared:**  
**Person checked:**

**\*\* Non-Signalized Intersection \*\***

**Major Road:** Bronte St S runs N/S

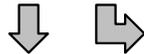
North Leg Total: 2614  
 North Entering: 1404  
 North Peds: 0  
 Peds Cross:

Heavys	2	0	2
Trucks	5	1	6
Cars	1139	257	1396
<b>Totals</b>	<b>1146</b>	<b>258</b>	

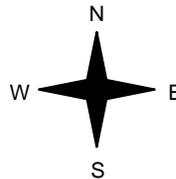


Heavys	1
Trucks	3
Cars	1206
<b>Totals</b>	<b>1210</b>

East Leg Total: 660  
 East Entering: 352  
 East Peds: 39  
 Peds Cross:



Bronte St S



Cars	Trucks	Heavys	Totals
284	1	0	285



66	1	0	67
<b>350</b>	<b>2</b>	<b>0</b>	

Whitlock Ave



Bronte St S



Cars	1205
Trucks	6
Heavys	2
<b>Totals</b>	<b>1213</b>



Cars	922	49	971
Trucks	2	1	3
Heavys	1	0	1
<b>Totals</b>	<b>925</b>	<b>50</b>	

Cars	Trucks	Heavys	Totals
306	2	0	308

Peds Cross:   
 South Peds: 1  
 South Entering: 975  
 South Leg Total: 2188

### Comments



**Accu-Traffic Inc.**  
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc. Traffic Count Summary

Intersection: Bronte St S & Whitlock Ave      Count Date: 7-Jun-25      Municipality: Milton

<b>North Approach Totals</b>						North/South Total Approaches	<b>South Approach Totals</b>					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	58	250	0	308	0	525	12:00:00	0	210	7	217	0
13:00:00	74	313	0	387	0	607	13:00:00	0	208	12	220	1
14:00:00	54	289	0	343	0	604	14:00:00	0	246	15	261	0
15:00:00	72	294	0	366	0	643	15:00:00	0	261	16	277	0
<b>Totals:</b>	258	1146	0	1404	0	2379	<b>S Totals:</b>	0	925	50	975	1
<b>East Approach Totals</b>						East/West Total Approaches	<b>West Approach Totals</b>					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	12	0	74	86	14	86	12:00:00	0	0	0	0	0
13:00:00	19	0	74	93	10	93	13:00:00	0	0	0	0	0
14:00:00	17	0	71	88	9	88	14:00:00	0	0	0	0	0
15:00:00	19	0	66	85	6	85	15:00:00	0	0	0	0	0
<b>Totals:</b>	67	0	285	352	39	352	<b>W Totals:</b>	0	0	0	0	0
<b>Calculated Values for Traffic Crossing Major Street</b>												
Hours Ending:	11:00	12:00	13:00	14:00					15:00	0:00	0:00	0:00
Crossing Values:	0	12	20	17					19	0	0	0









# **Appendix F:**

## **Background Development Traffic Volumes**

## **Appendix F1:**

# Background Development Site Volume Figures provided by the Town



# Mattamy Varga Subdivision Site Traffic Volumes

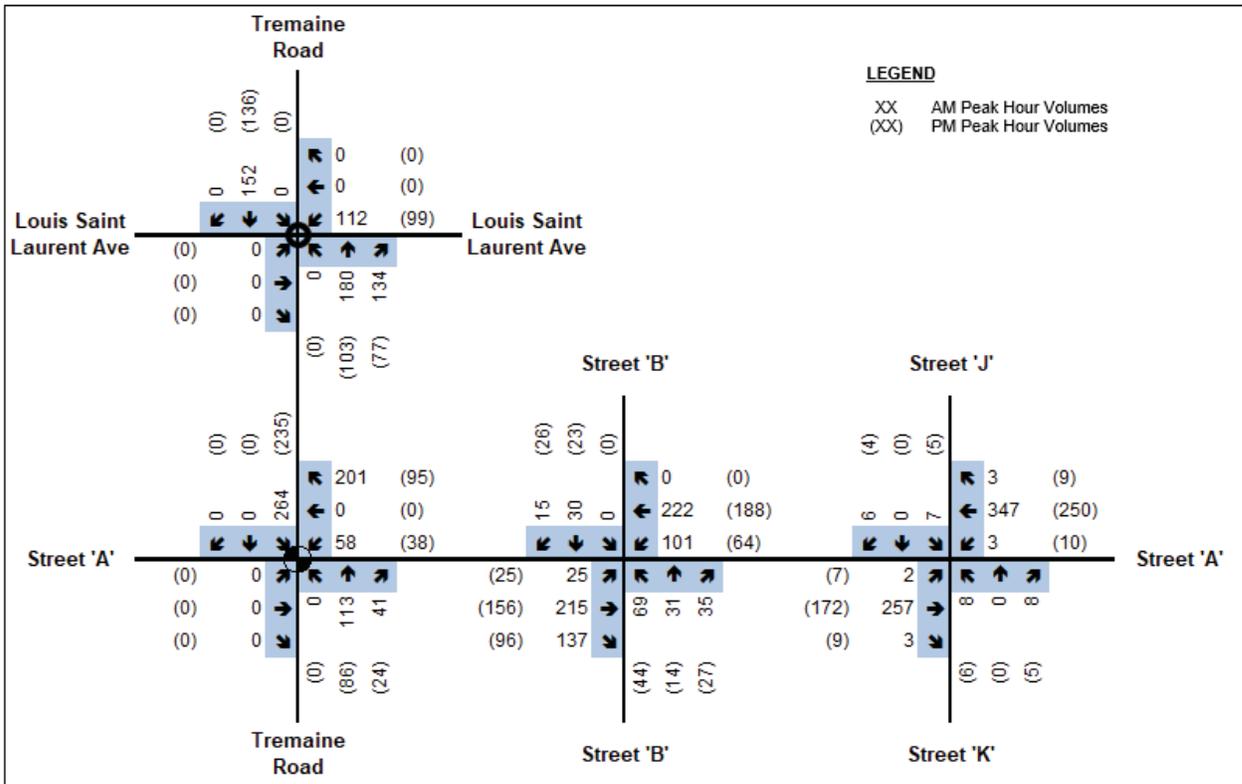


Figure 6 Site Traffic Volumes - Ultimate

The Halton Region, in their comments dated June 27, 2019, have raised concern regarding the discrepancies of the westbound traffic along Street 'A' between Street 'B' and Tremaine Road. Specifically, why westbound volumes at Tremaine Road are lower than ones at Street 'B'.

Between Street 'B' and Tremaine Road, detached single houses are proposed along north side of Street 'A', townhouses are proposed along the south side and major node 380 is also proposed at the south-east corner of Street 'A' at Tremaine intersection.

For all of these proposed developments, the distribution of site traffic exiting westwards (consisting portion eastbound traffic that travel along Louis Saint Laurent Avenue and the northbound traffic) towards Tremaine Road and incoming trips coming westbound from Street 'B' intersection are roughly the same (about 45% of in/out trips). However, as shown in **Appendix D**, a direct right-in-right-out access connecting to Tremaine Road is proposed for major node 380. The 'westward' exiting traffic (portion of eastbound and northbound traffic) generated by node 380 are expected to exit the site using the RIRO access directly onto Tremaine Road. Therefore, these trips are accounted for as northbound traffic volumes at the intersection of Street 'A' at Tremaine Road, instead of as the westbound traffic. Because of the proposed RIRO access at major node 380, the westbound site traffic for the intersection of Street 'A' at Tremaine Road are expected to be lower compared to the westbound site traffic for intersection of Street 'A' at Street 'B'.

Note that the site traffic volumes for interim (RIRO) condition shown in **Figure 5**,



# Pony Pines Subdivision Site Traffic Volumes

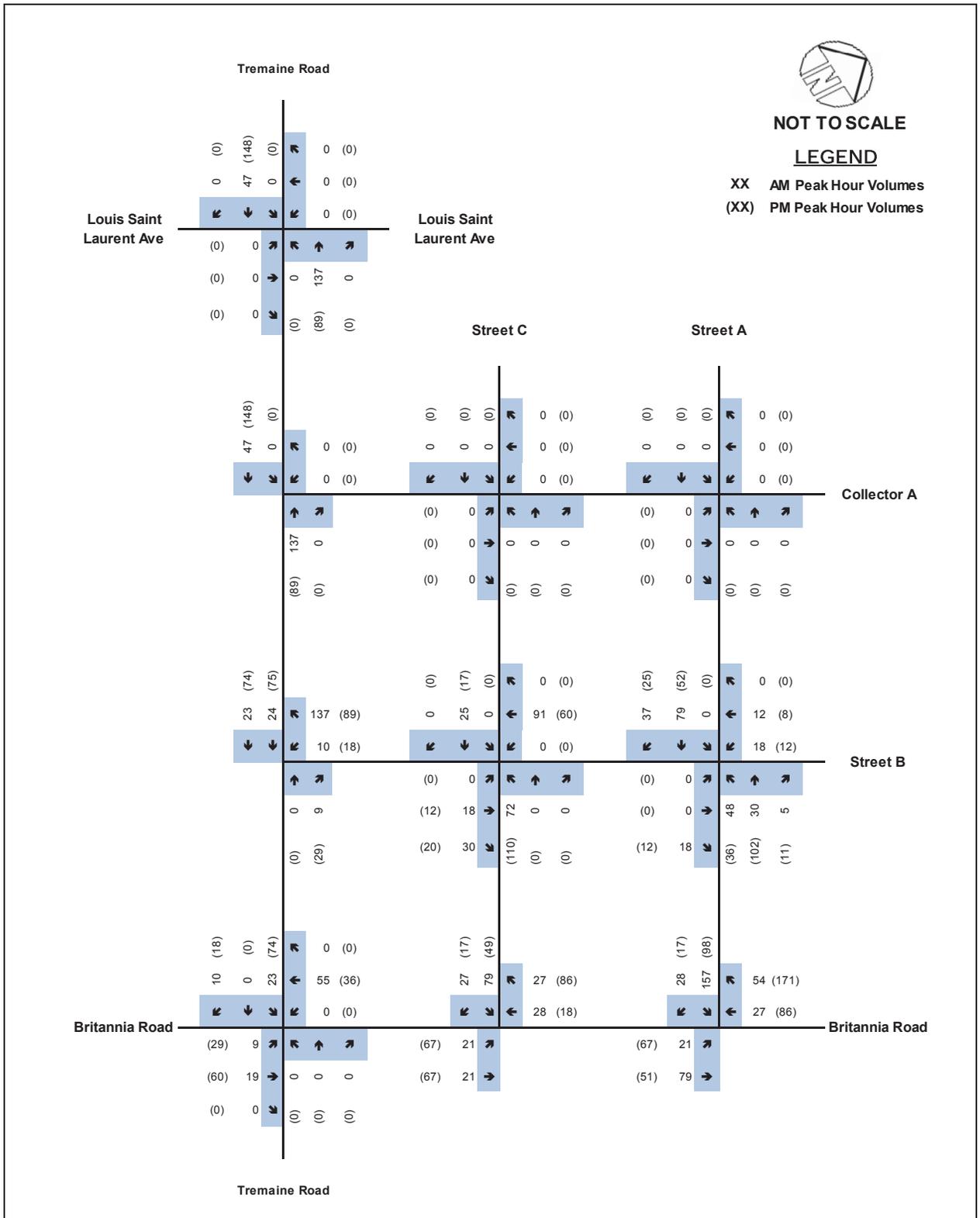
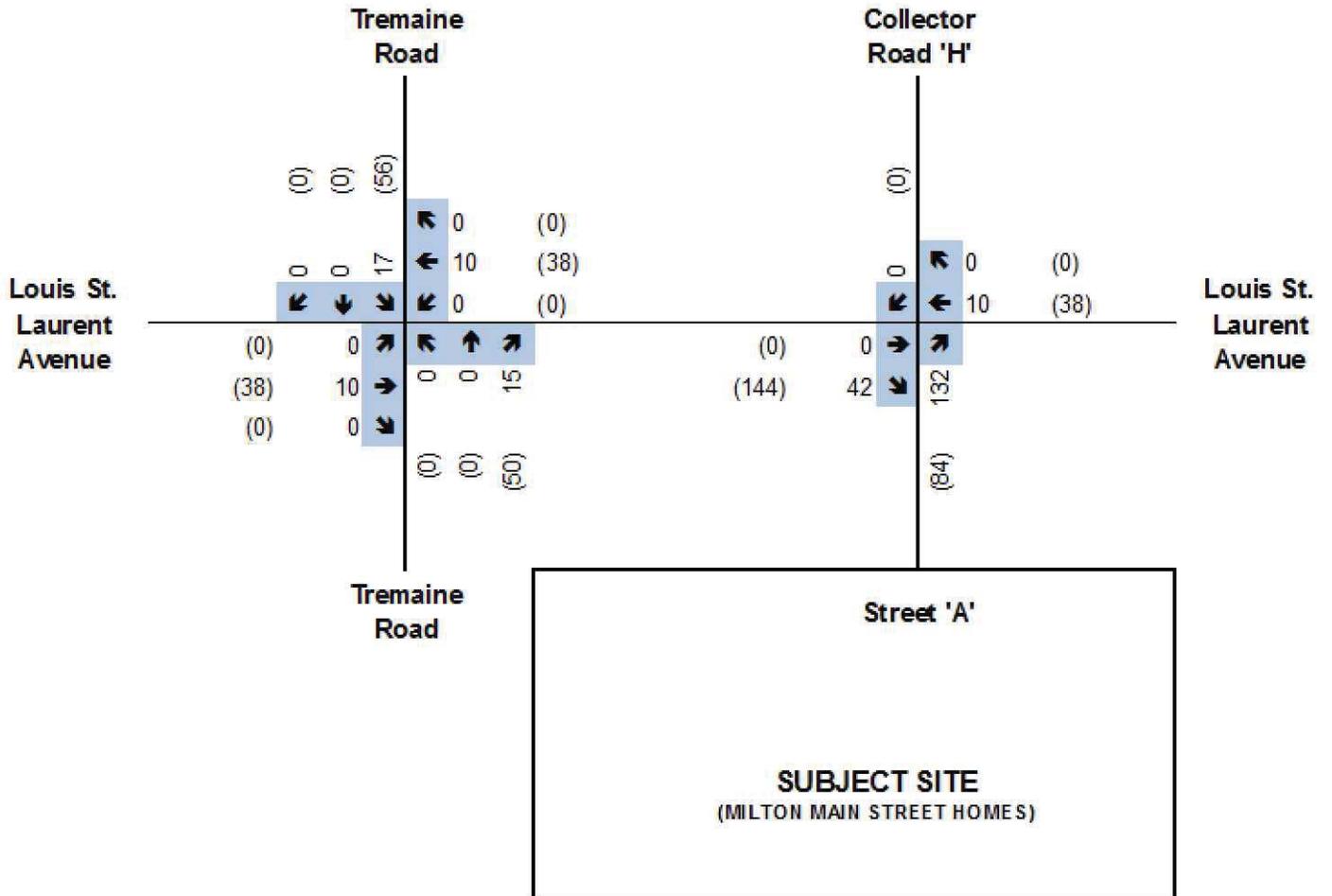


Figure 15 Estimated Site Trips - 2029

# Milton Main Street Homes Subdivision Site Traffic Volumes



**Legend**  
 XX AM Peak Hour Volumes  
 (XX) PM Peak Hour Volumes  
 Signalized Intersection



Conservatory Group  
 Milton Main Street Homes  
 Traffic Assessment

Job Number | 88-11915  
 Revision | A  
 Date | Feb 2018

Estimated Site Traffic

**Figure 04**



# Elsie MacGill Secondary School Site Traffic Volumes

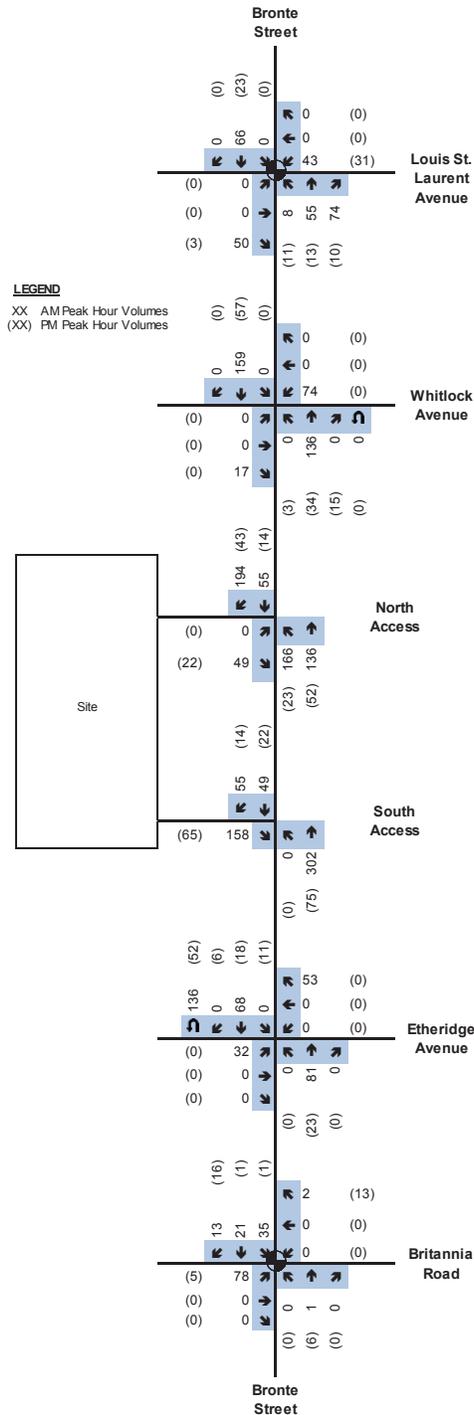
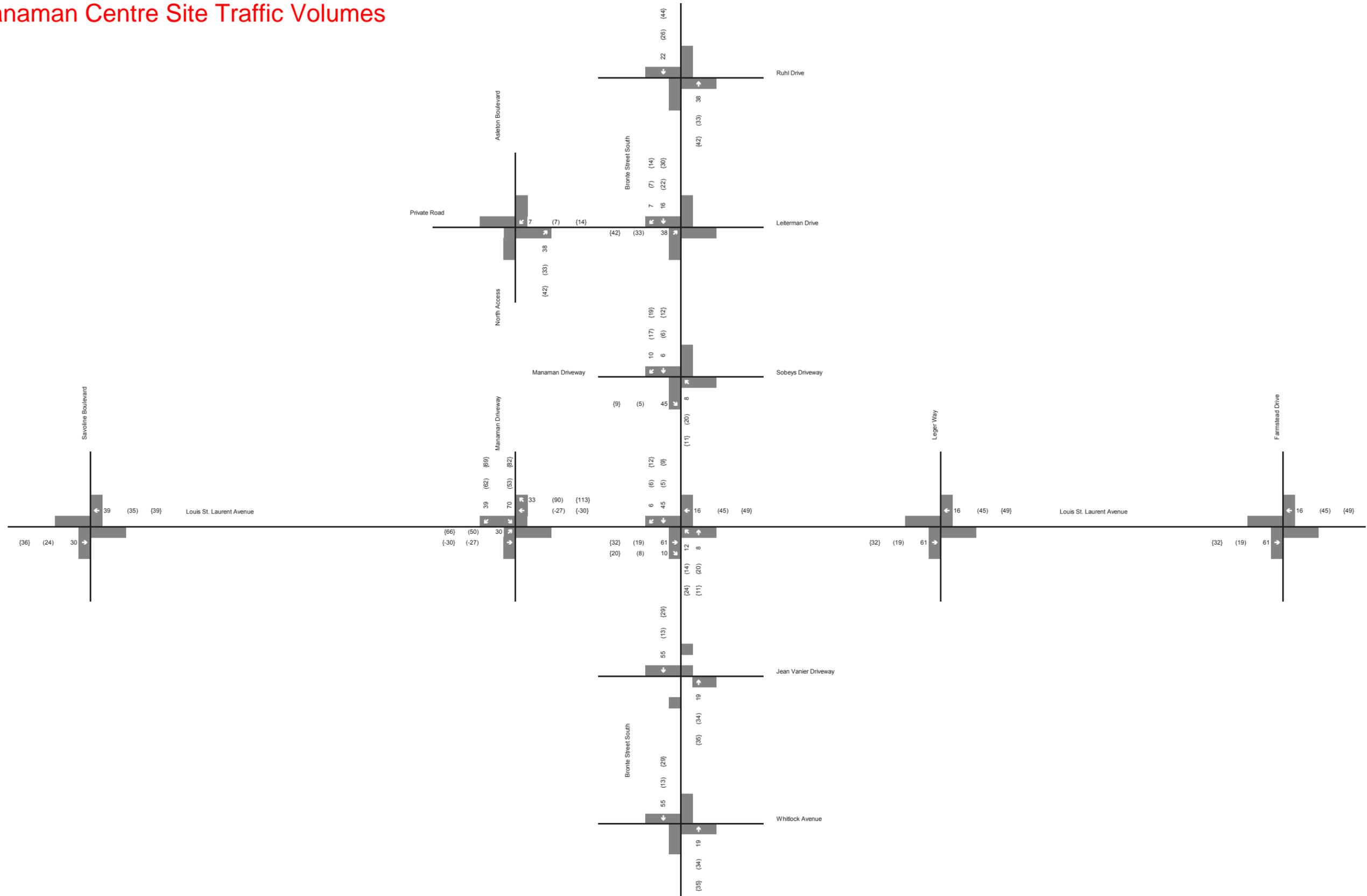


Figure 7 Site Trip Assignment

# Manaman Centre Site Traffic Volumes



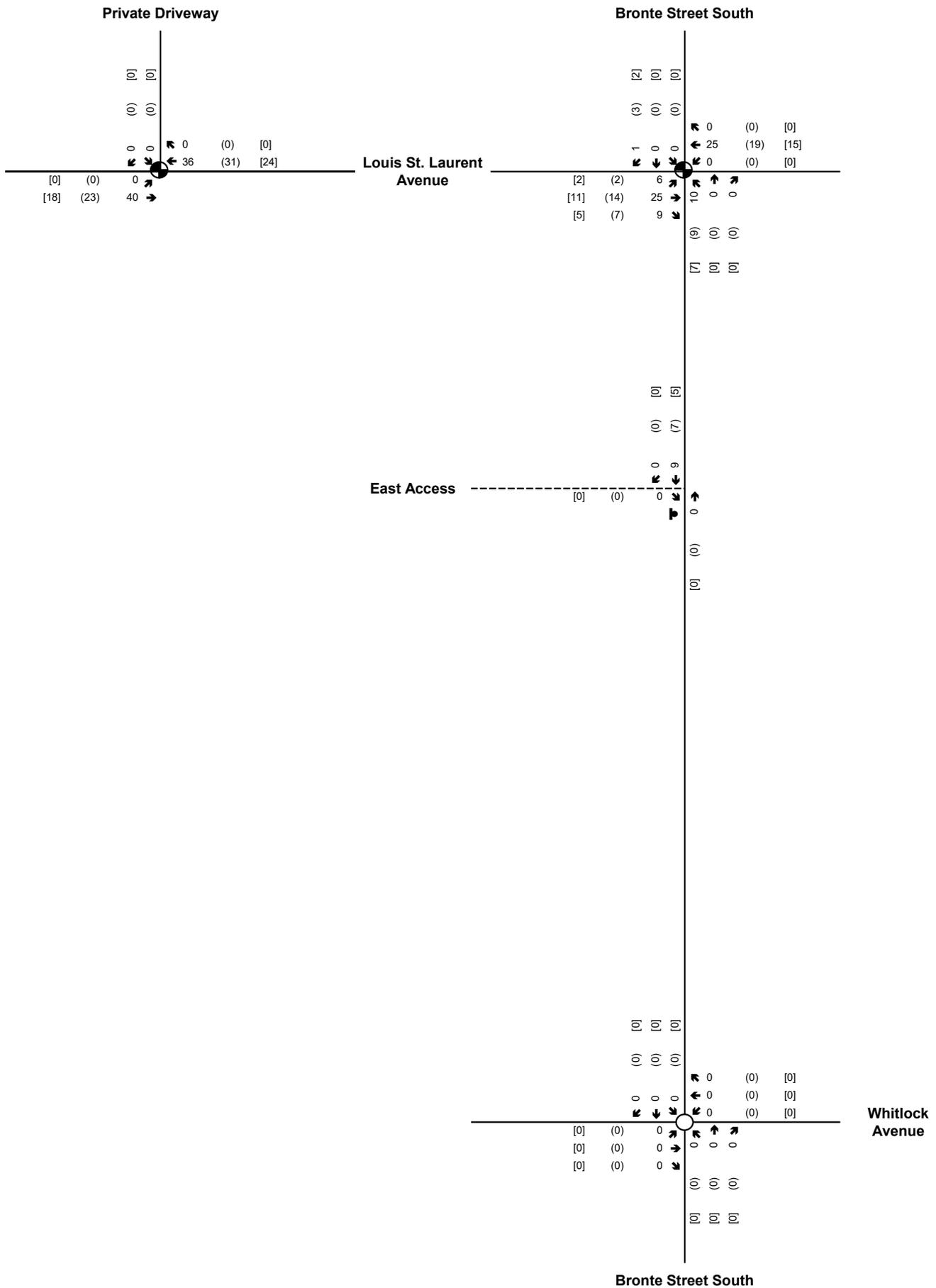
xx A.M. Peak Hour Traffic Volumes  
 (xx) P.M. Peak Hour Traffic Volumes  
 {xx} Weekend Peak Hour Traffic Volumes

**FIGURE 5**  
 Site Generated Traffic Volumes



# **Appendix F2:**

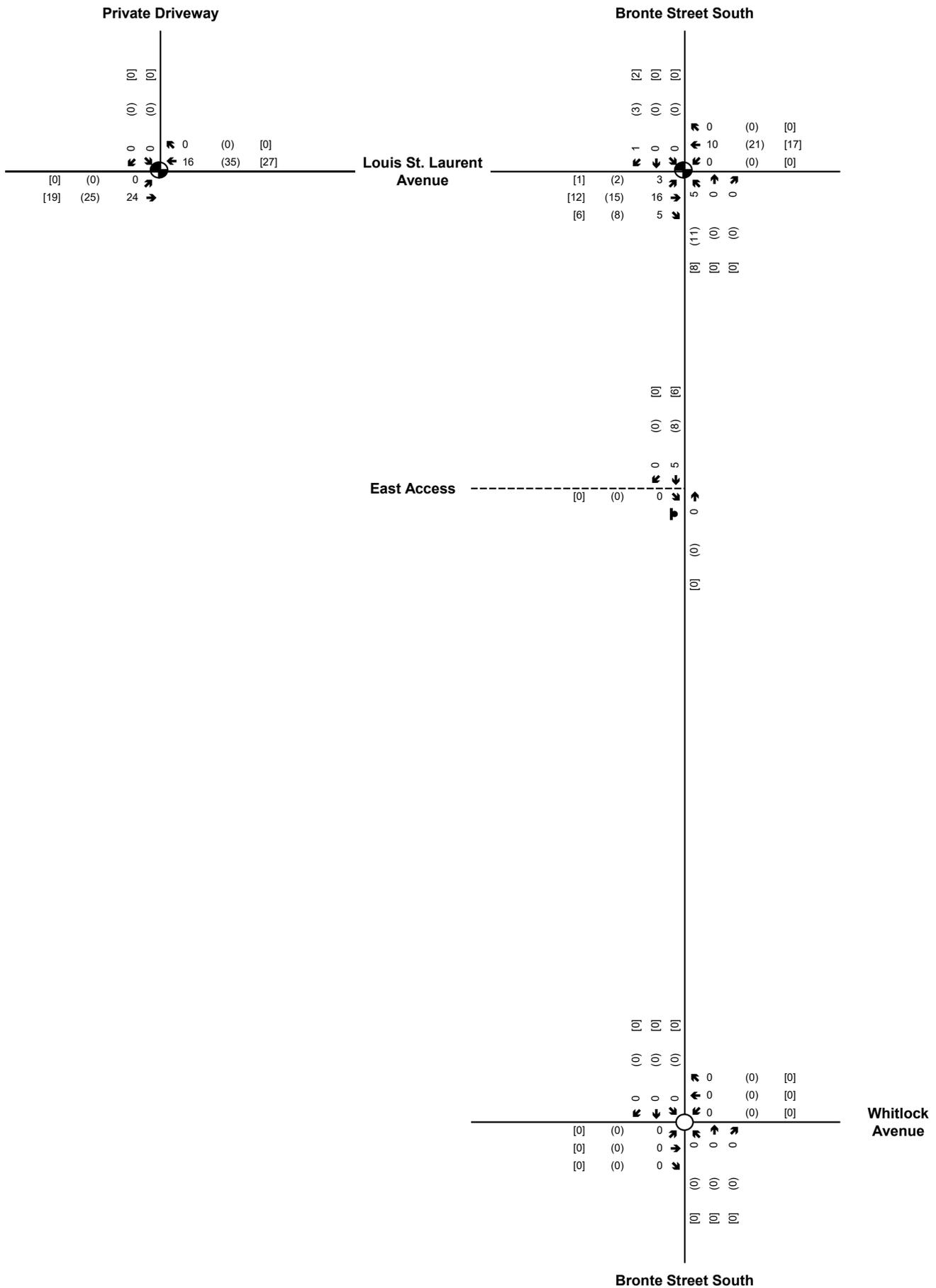
## **Background Development Site Volumes at Subject Site**



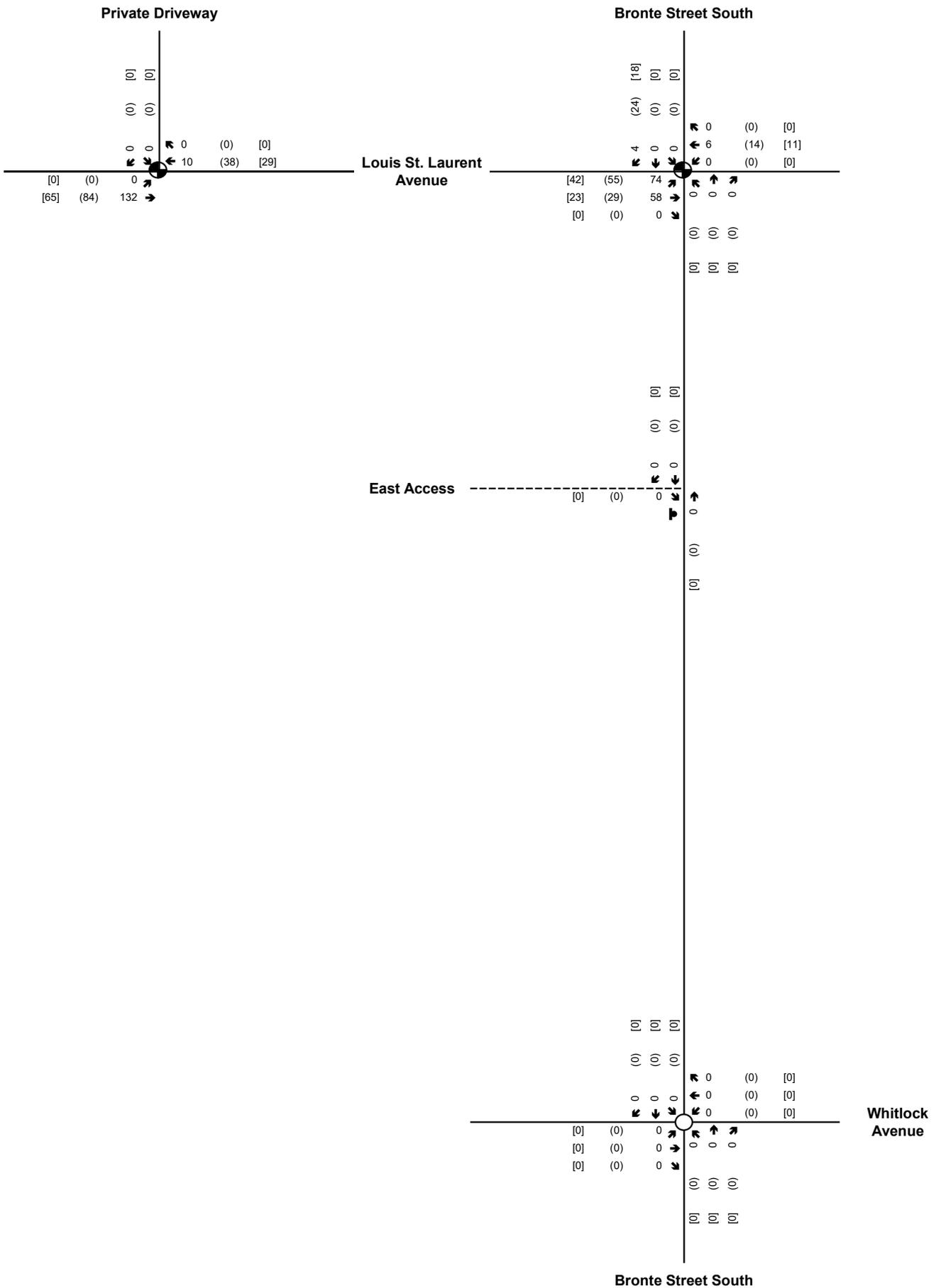
**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ◉ Signalized Intersection
- Roundabout
- ⬇ Stop Control

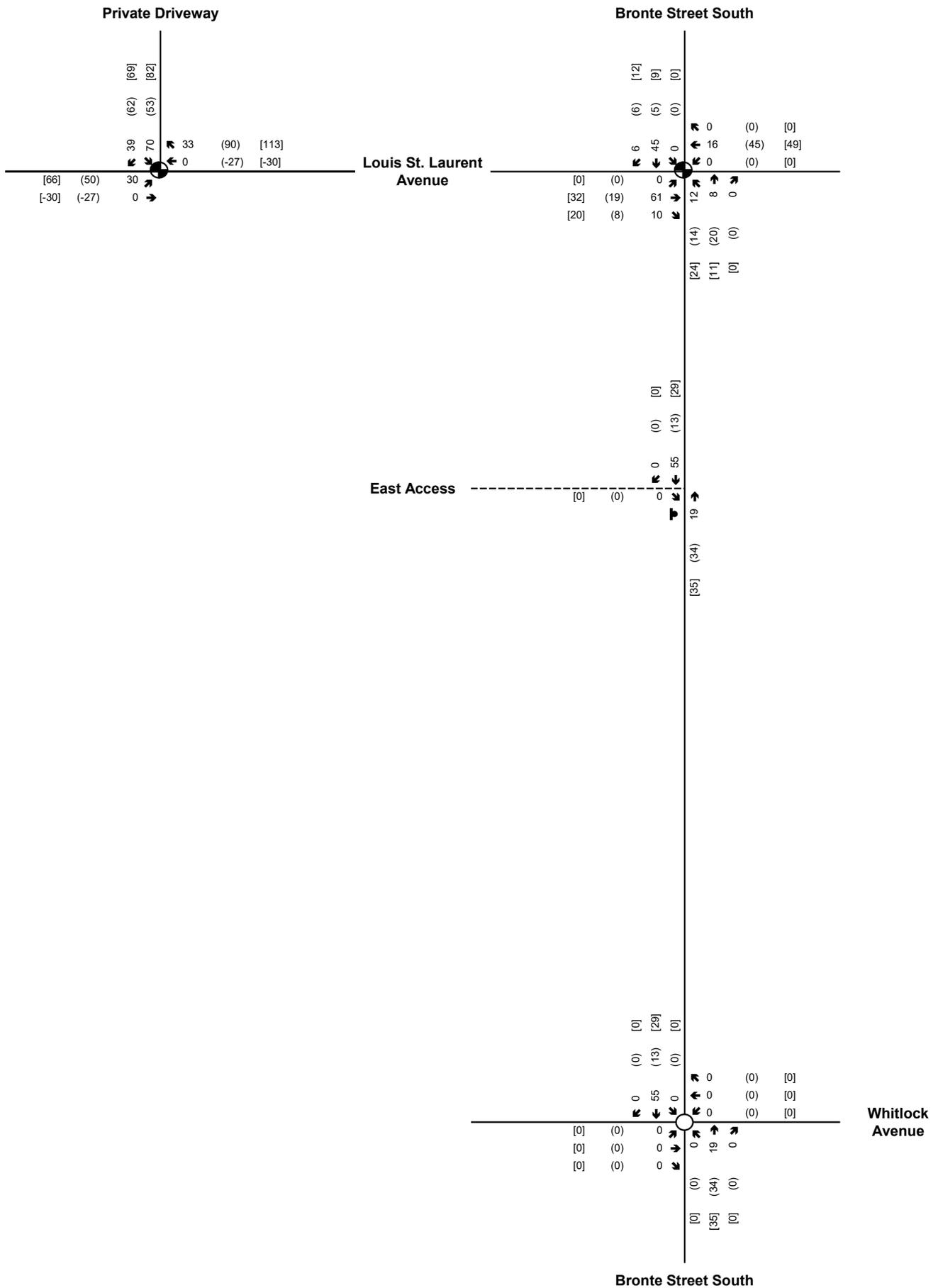
**Figure F2-1**  
**Mattamy Varga Subdivision**  
**Site Traffic Volumes**



**Figure F2-2**  
**Pony Pines Subdivision**  
**Site Traffic Volumes**



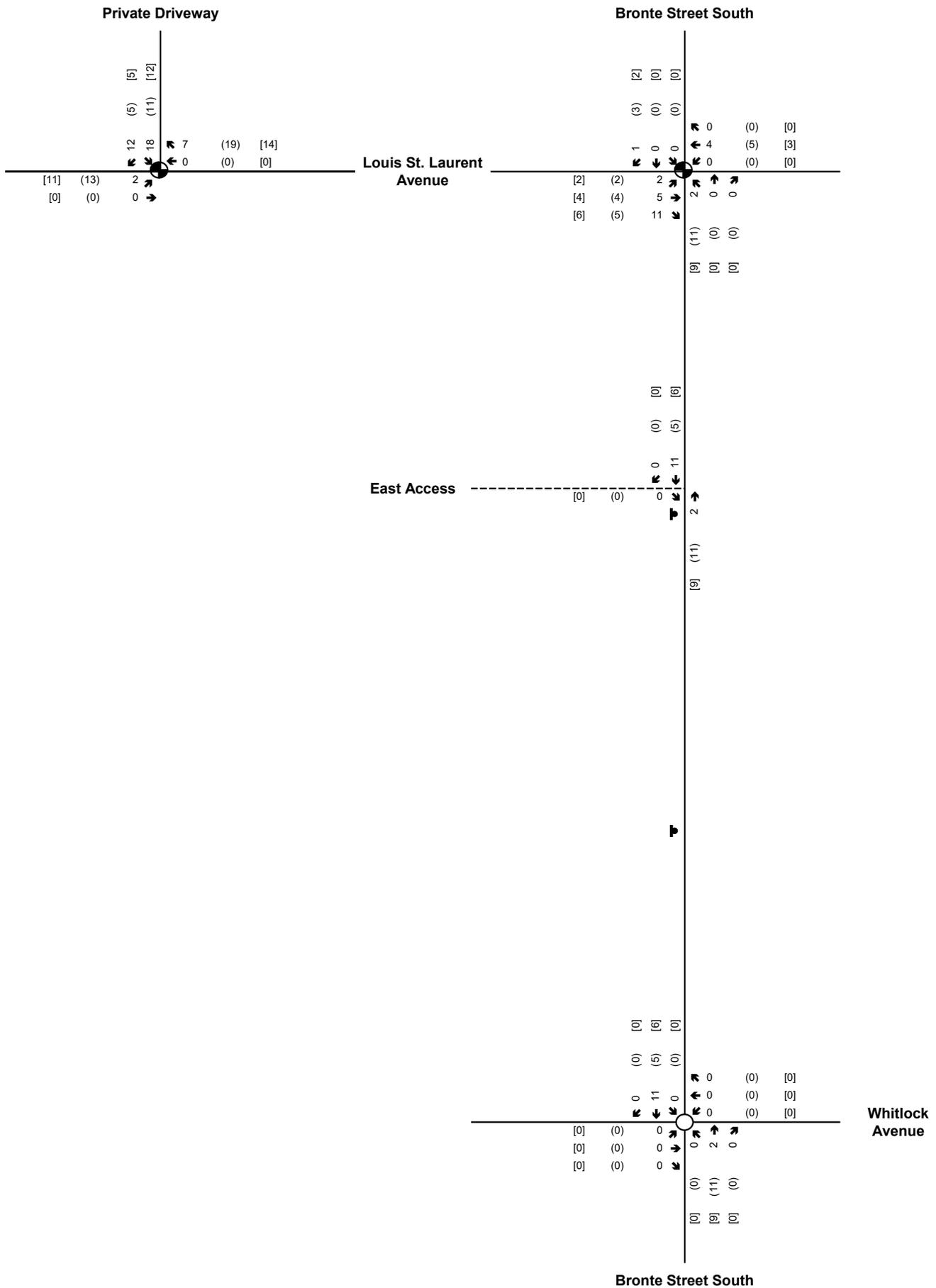
**Figure F2-3**  
**Milton Main Street Homes Subdivision**  
**Site Traffic Volumes**



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ◉ Signalized Intersection
- Roundabout
- Stop Control

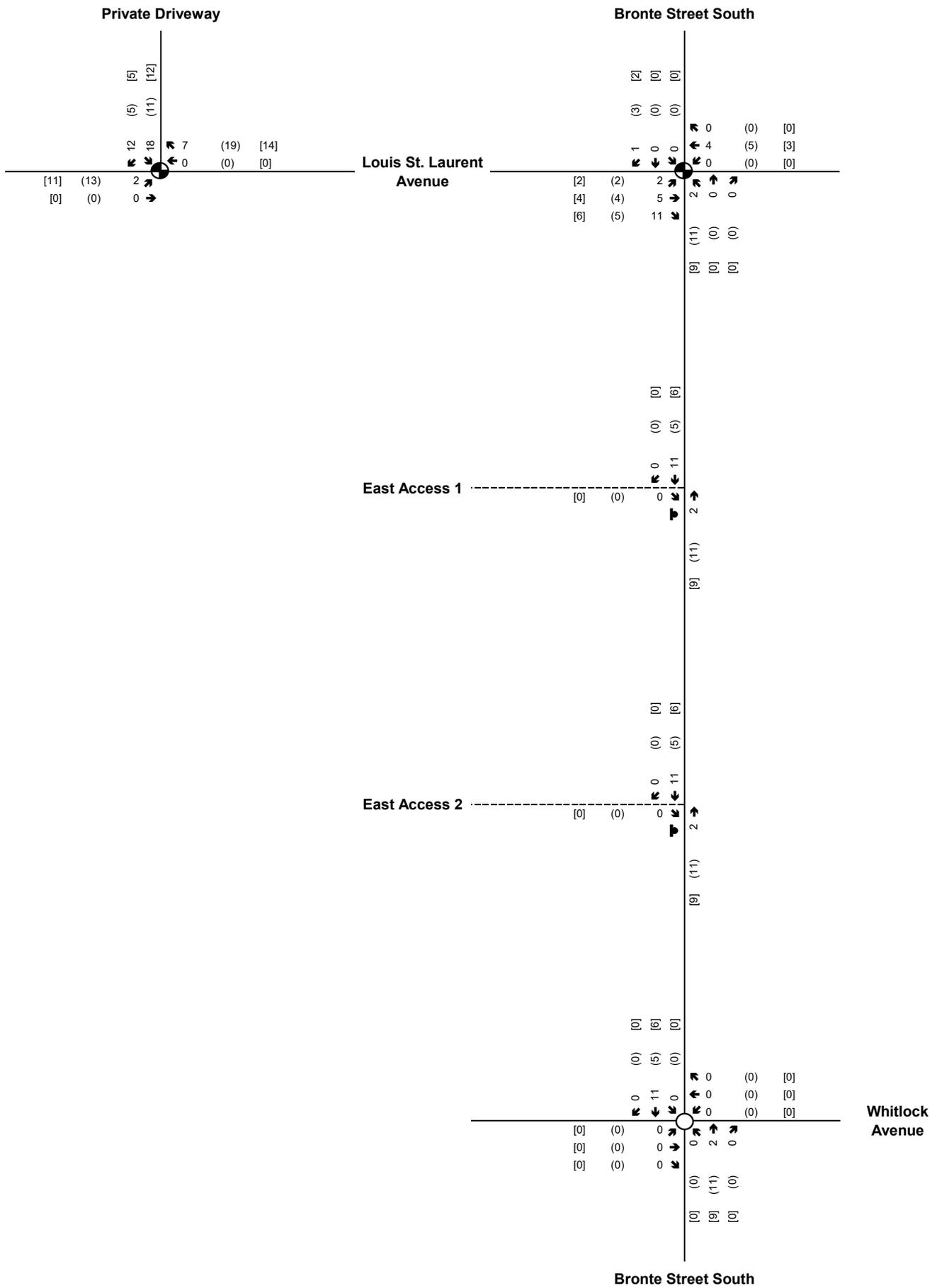
**Figure F2-4**  
**Manaman Centre**  
**Site Traffic Volumes**



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ◉ Signalized Intersection
- Roundabout
- ◐ Stop Control

**Figure F2-5**  
**Fieldgate North Residential**  
**Development Site Traffic Volumes**



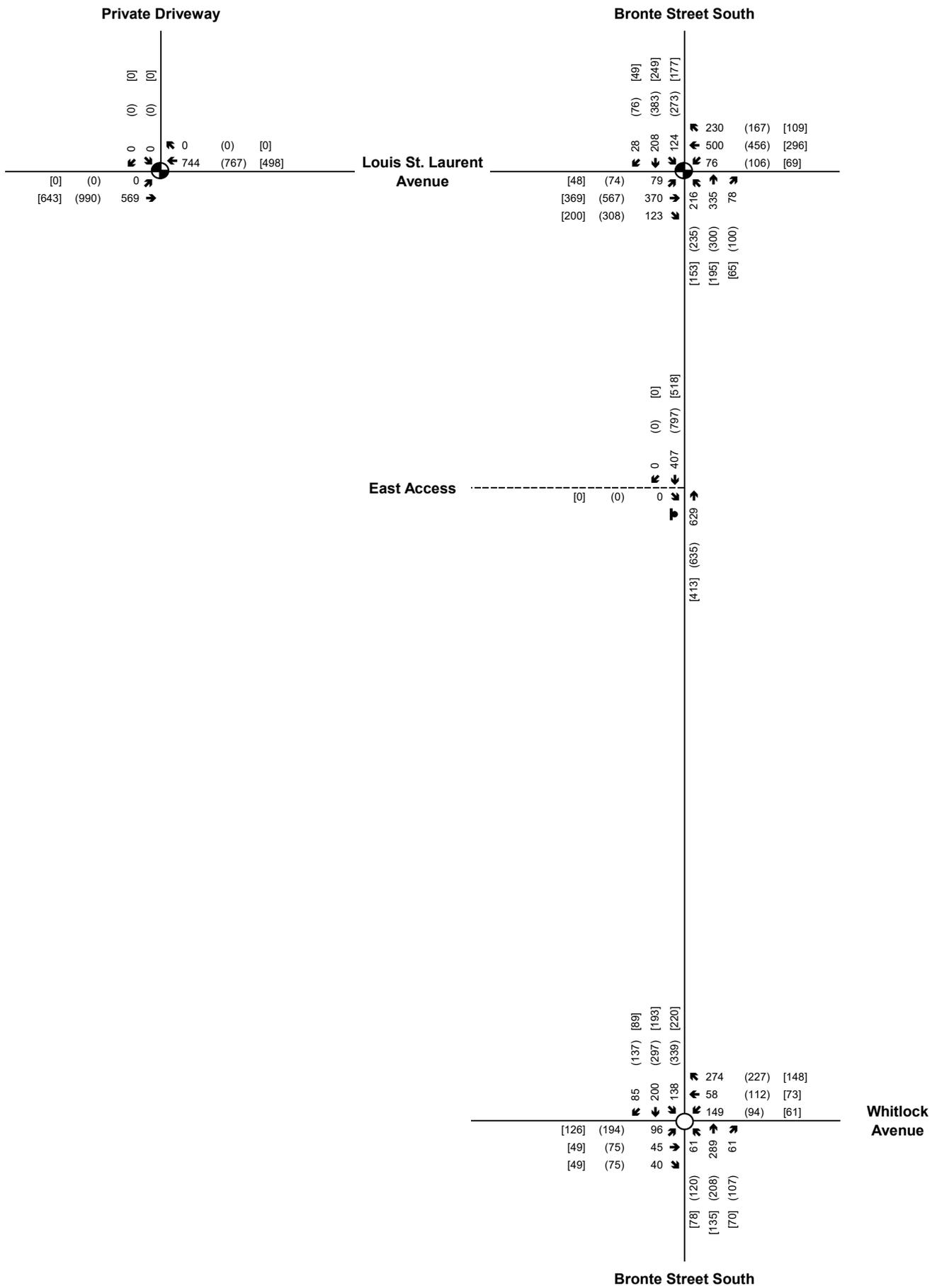
**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ⊕ Signalized Intersection
- Roundabout
- ⬇ Stop Control

**Figure F2-6**  
**Fieldgate North Residential**  
**Development Site Traffic Volumes**

## **Appendix G:**

# Boyne RNA Study Total Site Traffic Volumes

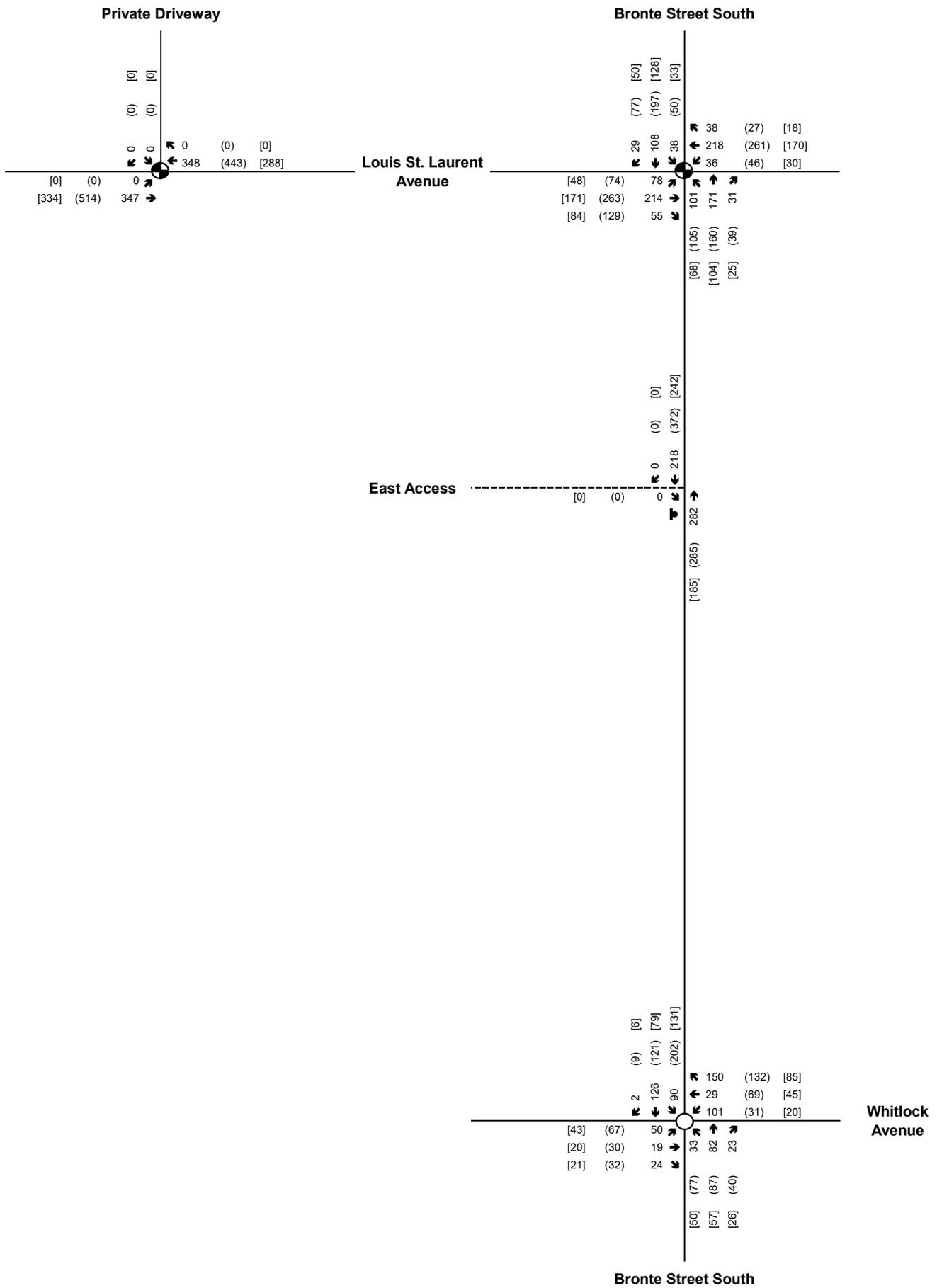


**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ⊕ Signalized Intersection
- Roundabout
- Stop Control

**Figure G-1**

**2032 Boyne Gross Traffic Volumes**

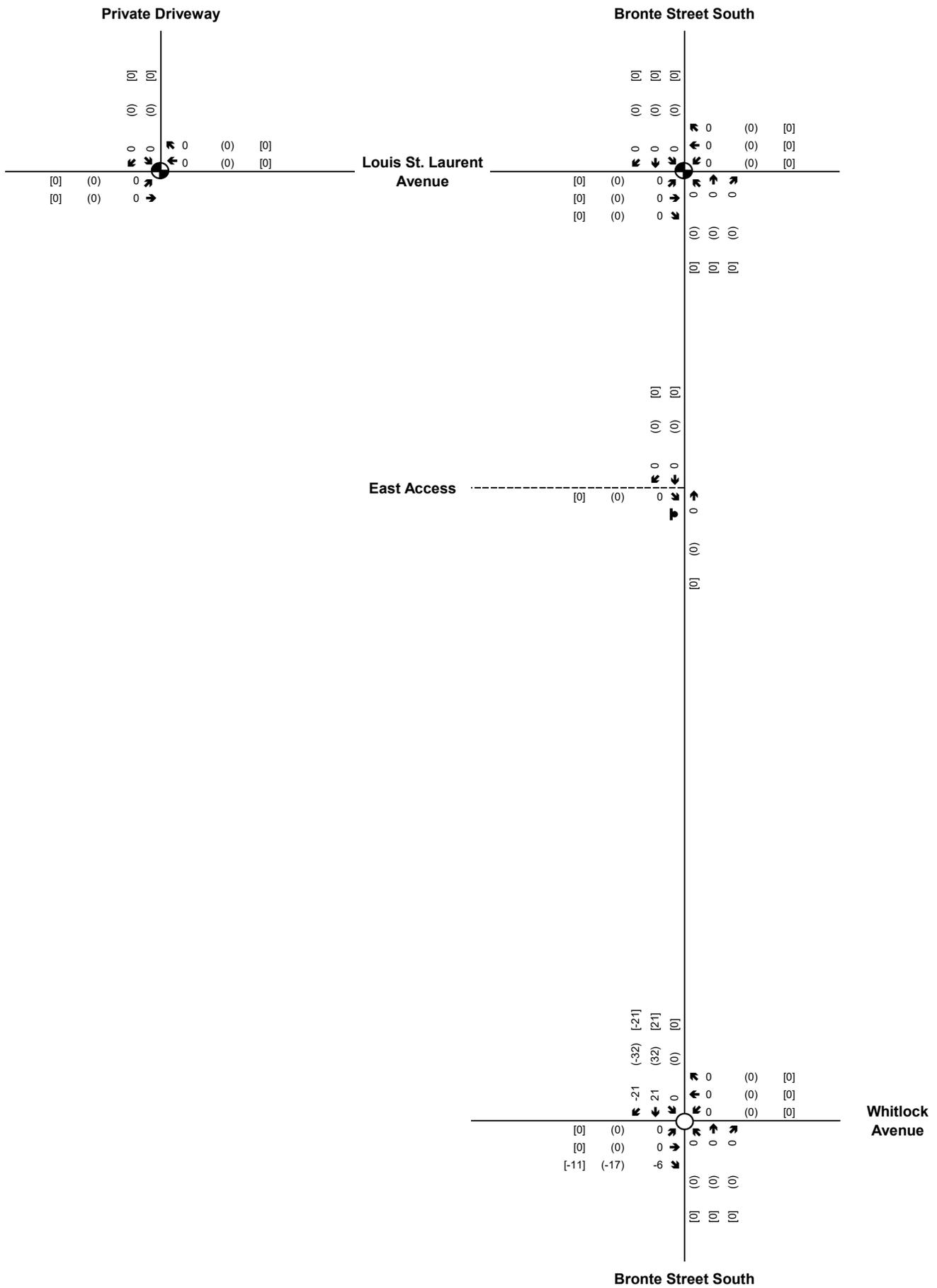


**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ⊕ Signalized Intersection
- Roundabout
- Stop Control

**Figure G-2**

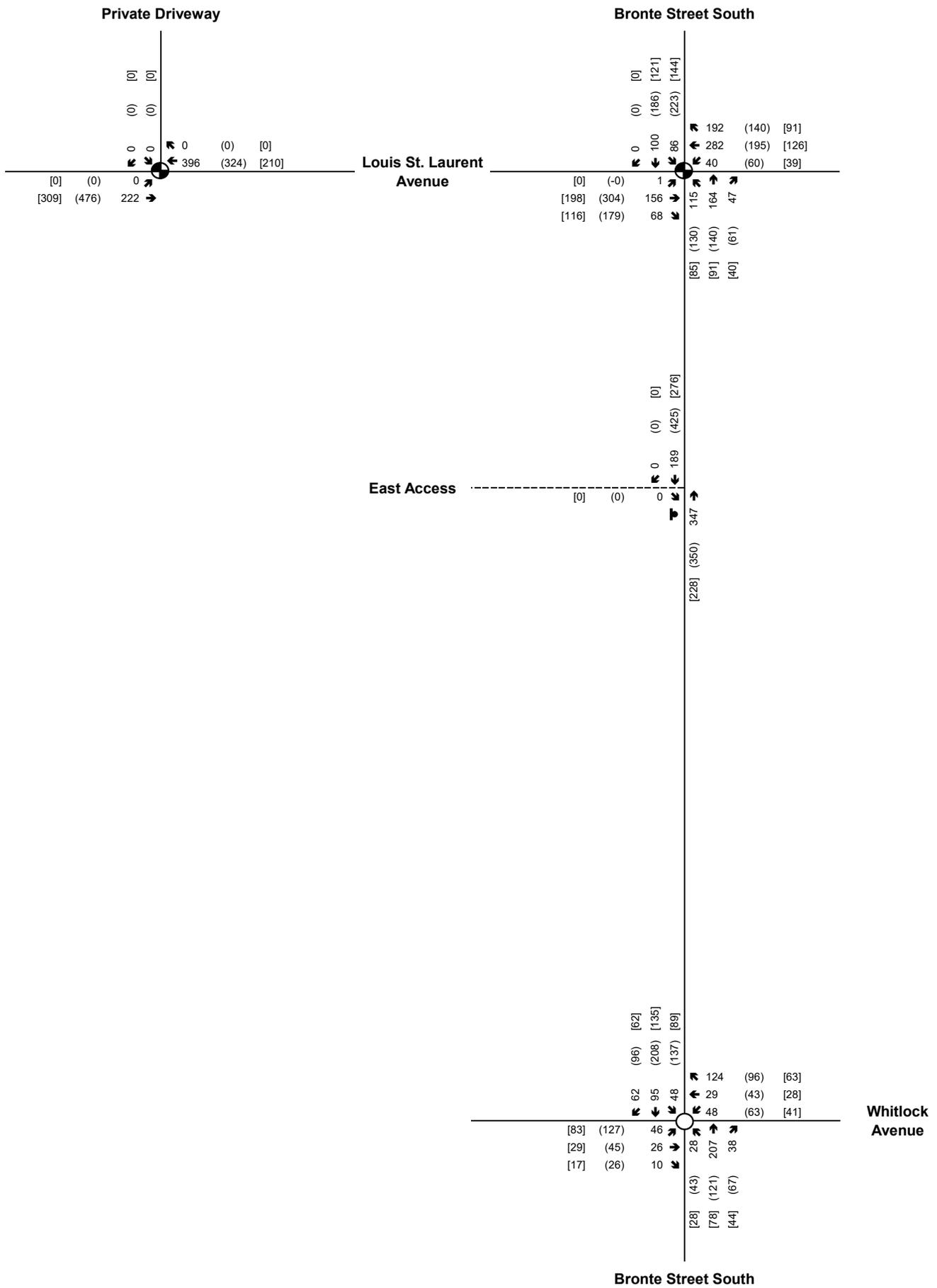
**2032 Boyne Removed Traffic Volumes**



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ⊕ Signalized Intersection
- Roundabout
- ⊥ Stop Control

**Figure G-3**  
**2032 Boyne Park Reroute**  
**Traffic Volumes**



**LEGEND**

- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- [XX] SAT Peak Hour Volumes
- ⦿ Signalized Intersection
- Roundabout
- ⬇ Stop Control

**Figure G-4**

**2032 Boyne Net Traffic Volumes**

# **Appendix H:**

## **ITE Land Use Information and Pass-by Rates**

# Land Use: 820

## Shopping Center

### Description

A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. A shopping center also provides on-site parking facilities sufficient to serve its own parking demands. Factory outlet center (Land Use 823) is a related use.

### Additional Data

Shopping centers, including neighborhood centers, community centers, regional centers, and super regional centers, were surveyed for this land use. Some of these centers contained non-merchandising facilities, such as office buildings, movie theaters, restaurants, post offices, banks, health clubs, and recreational facilities (for example, ice skating rinks or indoor miniature golf courses).

**Many shopping centers, in addition to the integrated unit of shops in one building or enclosed around a mall, include outparcels (peripheral buildings or pads located on the perimeter of the center adjacent to the streets and major access points). These buildings are typically drive-in banks, retail stores, restaurants, or small offices. Although the data herein do not indicate which of the centers studied included peripheral buildings, it can be assumed that some of the data show their effect.**

The vehicle trips generated at a shopping center are based upon the total GLA of the center. In cases of smaller centers without an enclosed mall or peripheral buildings, the GLA could be the same as the gross floor area of the building.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 12:15 and 1:15 p.m., respectively.

The average numbers of person trips per vehicle trip at the 27 general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.31 during Weekday, AM Peak Hour of Generator
- 1.43 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 1.46 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), British Columbia (CAN), California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

### Source Numbers

105, 110, 154, 156, 159, 186, 190, 198, 199, 202, 204, 211, 213, 239, 251, 259, 260, 269, 294, 295, 299, 300, 301, 304, 305, 307, 308, 309, 310, 311, 314, 315, 316, 317, 319, 358, 365, 376, 385, 390, 400, 404, 414, 420, 423, 428, 437, 440, 442, 444, 446, 507, 562, 580, 598, 629, 658, 702, 715, 728, 868, 870, 871, 880, 899, 908, 912, 915, 926, 936, 944, 946, 960, 961, 962, 973, 974, 978

**Table E.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM Peak Period Land Use Code 820—Shopping Center**

SIZE (1,000 SQ. FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
921	Albany, NY	July & Aug. 1985	196	4:00–6:00 p.m.	23	42	35	77	—	60,950	Raymond Keyes Assoc.
108	Overland Park, KS	July 1988	111	4:30–5:30 p.m.	26	61	13	74	—	34,000	—
118	Overland Park, KS	Aug. 1988	123	4:30–5:30 p.m.	25	55	20	75	—	—	—
256	Greece, NY	June 1988	120	4:00–6:00 p.m.	38	62	—	62	—	23,410	Sear Brown
160	Greece, NY	June 1988	78	4:00–6:00 p.m.	29	71	—	71	—	57,306	Sear Brown
550	Greece, NY	June 1988	117	4:00–6:00 p.m.	48	52	—	52	—	40,763	Sear Brown
51	Boca Raton, FL	Dec. 1987	110	4:00–6:00 p.m.	33	34	33	67	—	42,225	Kimley-Horn and Assoc. Inc.
1,090	Ross Twp, PA	July 1988	411	2:00–8:00 p.m.	34	56	10	66	—	51,500	Wilbur Smith and Assoc.
97	Upper Dublin Twp, PA	Winter 1988/89	—	4:00–6:00 p.m.	41	—	—	59	—	34,000	McMahon Associates
118	Tredyffrin Twp, PA	Winter 1988/89	—	4:00–6:00 p.m.	24	—	—	76	—	10,000	Booz Allen & Hamilton
122	Lawnside, NJ	Winter 1988/89	—	4:00–6:00 p.m.	37	—	—	63	—	20,000	Pennoni Associates
126	Boca Raton, FL	Winter 1988/89	—	4:00–6:00 p.m.	43	—	—	57	—	40,000	McMahon Associates
150	Willow Grove, PA	Winter 1988/89	—	4:00–6:00 p.m.	39	—	—	61	—	26,000	Booz Allen & Hamilton
153	Broward Cnty., FL	Winter 1988/89	—	4:00–6:00 p.m.	50	—	—	50	—	85,000	McMahon Associates
153	Arden, DE	Winter 1988/89	—	4:00–6:00 p.m.	30	—	—	70	—	26,000	Orth-Rodgers & Assoc. Inc.
154	Doylestown, PA	Winter 1988/89	—	4:00–6:00 p.m.	32	—	—	68	—	29,000	Orth-Rodgers & Assoc. Inc.
164	Middletown Twp, PA	Winter 1988/89	—	4:00–6:00 p.m.	33	—	—	67	—	25,000	Booz Allen & Hamilton
166	Haddon Twp, NJ	Winter 1988/89	—	4:00–6:00 p.m.	20	—	—	80	—	6,000	Pennoni Associates
205	Broward Cnty., FL	Winter 1988/89	—	4:00–6:00 p.m.	55	—	—	45	—	62,000	McMahon Associates

**Table E.9 (Cont'd) Pass-By and Non-Pass-By Trips Weekday, PM Peak Period Land Use Code 820—Shopping Center**

SIZE (1,000 SQ. FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIP (%)			ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL			
237	W. Windsor Twp, NJ	Winter 1988/89	—	4:00–6:00 p.m.	48	—	—	52	—	46,000	Booz Allen & Hamilton
242	Willow Grove, PA	Winter 1988/89	—	4:00–6:00 p.m.	37	—	—	63	—	26,000	McMahon Associates
297	Whitehall, PA	Winter 1988/89	—	4:00–6:00 p.m.	33	—	—	67	—	26,000	Orth-Rodgers & Assoc. Inc.
360	Broward Cnty., FL	Winter 1988/89	—	4:00–6:00 p.m.	44	—	—	56	—	73,000	McMahon Associates
370	Pittsburgh, PA	Winter 1988/89	—	4:00–6:00 p.m.	19	—	—	81	—	33,000	Wilbur Smith
150	Portland, OR	—	519	4:00–6:00 p.m.	68	6	26	32	—	25,000	Kittelson and Associates
150	Portland, OR	—	655	4:00–6:00 p.m.	65	7	28	35	—	30,000	Kittelson and Associates
760	Calgary, Alberta	Oct.-Dec. 1987	15,436	4:00–6:00 p.m.	20	39	41	80	—	—	City of Calgary DOT
178	Bordentown, NJ	Apr. 1989	154	2:00–6:00 p.m.	35	—	—	65	—	37,980	Raymond Keyes Assoc.
144	Manalapan, NJ	July 1990	176	3:30–6:15 p.m.	32	44	24	68	—	69,347	Raymond Keyes Assoc.
549	Natick, MA	Feb. 1989	—	4:45–5:45 p.m.	33	26	41	67	—	48,782	Raymond Keyes Assoc.

Average Pass-By Trip Percentage: 34

“—” means no data were provided

**Table E.10 Pass-By and Non-Pass-By Trips Saturday, Mid-Day Peak Period  
Land Use Code 820—Shopping Center**

SIZE (1,000 SQ. FT. GFA)	LOCATION	SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
						PRIMARY	DIVERTED	TOTAL		
720	Framingham, MA	Feb. 1984	258	11:00 a.m.–4:00 p.m.	23	34	43	77	—	Raymond Keyes Assoc.
600	Brandywine, DE	Apr. 1983	256	10:00 a.m.–3:00 p.m.	17	50	33	83	—	Raymond Keyes Assoc.
880	Christiana, DE	July 1984	198	11:00 a.m.–4:00 p.m.	5	55	40	95	—	Raymond Keyes Assoc.
234	Huntington LI, NY	Nov. 1985	223	11:00 a.m.–3:00 p.m.	39	22	39	61	—	Raymond Keyes Assoc.
658	Wayne, NJ	Sept. 1984	329	11:00 a.m.–4:00 p.m.	46	44	10	54	—	Raymond Keyes Assoc.
622	Ramsey Cnty, MN	Nov. 1985	119	11:00 a.m.–3:00 p.m.	23	21	56	77	—	Raymond Keyes Assoc.
736	Pensacola, FL	Oct. 1985	680	11:00 a.m.–3:00 p.m.	20	31	49	80	—	Raymond Keyes Assoc.
430	Ross, PA	June 1980	425	11:00 a.m.–4:00 p.m.	22	—	—	78	—	Raymond Keyes Assoc.
176	Tampa Springs, FL	May 1986	188	11:00 a.m.–3:00 p.m.	31	42	27	69	—	Raymond Keyes Assoc.
144	Manalapan, NJ	July 1990	264	11:00 a.m.–3:15 p.m.	31	47	22	69	63,362	Raymond Keyes Assoc.
549	Natick, MA	Feb. 1989	—	2:15–3:15 p.m.	28	39	33	72	48,782	Raymond Keyes Assoc.

Average Pass-By Trip Percentage: 26

“—” means no data were provided

# Land Use: 850 Supermarket

## Description

A supermarket is a free-standing retail store selling a complete assortment of food, food preparation and wrapping materials, and household cleaning items. Supermarkets may also contain the following products and services: ATMs, automobile supplies, bakeries, books and magazines, dry cleaning, floral arrangements, greeting cards, limited-service banks, photo centers, pharmacies, and video rental areas. Some facilities may be open 24 hours a day. Discount supermarket (Land Use 854) is a related use.

## Additional Data

***Caution should be used when applying daily trip generation rates for supermarkets, as the database contains a mixture of facilities with varying hours of operation. Future data submissions should specify hours of operation of a site.***

Time-of-day distribution data for this land use for a weekday, Saturday, and Sunday are presented in Appendix A. For the one general urban/suburban site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:00 a.m. and 12:00 p.m. and 4:00 and 5:00 p.m., respectively. For the one dense multi-use urban site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 5:15 and 6:15 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Colorado, Connecticut, District of Columbia, Florida, Illinois, Kentucky, Maryland, Minnesota, New Jersey, New York, Oregon, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, and Wisconsin.

## Source Numbers

213, 251, 273, 305, 359, 365, 438, 442, 447, 448, 514, 520, 552, 577, 610, 715, 716, 728, 746, 854, 870, 882, 917, 926, 935, 946, 961, 966, 975

**Table E.13 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period  
Land Use Code 850—Supermarket**

SIZE (1,000 SQ. FT. GFA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			AVERAGE DAILY TRAFFIC	SOURCE
						PRIMARY	DIVERTED	TOTAL		
30	Overland Park, KS	1987	40	4:30–5:30 p.m.	32	48	20	68	—	—
<25	Chicago suburbs, IL	1987	155	3:00–6:00 p.m.	56	—	—	44	—	Kenig, O'Hara, Humes, Flock
<25	Chicago suburbs, IL	1987	191	3:00–6:00 p.m.	57	—	—	43	—	Kenig, O'Hara, Humes, Flock
<25	Chicago suburbs, IL	1987	113	3:00–6:00 p.m.	56	—	—	44	—	Kenig, O'Hara, Humes, Flock
34	Omaha, NE	—	—	4:00–6:00 p.m.	44	29	27	56	15,200	University of Nebraska– Lincoln
66	Omaha, NE	—	—	4:00–6:00 p.m.	23	30	47	77	63,000	University of Nebraska– Lincoln
70	Omaha, NE	—	—	4:00–6:00 p.m.	26	30	44	74	34,300	University of Nebraska– Lincoln
31	Omaha, NE	—	—	4:00–6:00 p.m.	19	36	45	81	48,700	University of Nebraska– Lincoln
31	Omaha, NE	—	—	4:00–6:00 p.m.	28	40	32	72	23,500	University of Nebraska– Lincoln
55	Omaha, NE	—	—	4:00–6:00 p.m.	27	35	38	73	27,200	University of Nebraska– Lincoln
65	Omaha, NE	—	—	4:00–6:00 p.m.	25	25	50	75	44,700	University of Nebraska– Lincoln
31	Orlando, FL	1993	440	2:00–6:00 p.m.	35	—	—	65	—	TPD Inc.

Average Pass-By Trip Percentage: 36

“—” means no data were provided

# Land Use: 220

## Multifamily Housing (Low-Rise)

### Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), and off-campus student apartment (Land Use 225) are related land uses.

### Additional Data

In prior editions of *Trip Generation Manual*, the low-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:45 and 5:45 p.m., respectively. For the one site with Saturday data, the overall highest vehicle volume was counted between 9:45 and 10:45 a.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 11:45 a.m. and 12:45 p.m.

For the one dense multi-use urban site with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 6:15 and 7:15 p.m., respectively.

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

The average numbers of person trips per vehicle trip at the five general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.13 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.21 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, District of Columbia, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Minnesota, New Jersey, New York, Ontario, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, and Washington.

***It is expected that the number of bedrooms and number of residents are likely correlated to the number of trips generated by a residential site. Many of the studies included in this land use did not indicate the total number of bedrooms. To assist in the future analysis of this land use, it is important that this information be collected and included in trip generation data submissions.***

### **Source Numbers**

168, 187, 188, 204, 211, 300, 305, 306, 319, 320, 321, 357, 390, 412, 418, 525, 530, 571, 579, 583, 864, 868, 869, 870, 896, 903, 918, 946, 947, 948, 951

# Land Use: 221

## Multifamily Housing (Mid-Rise)

### Description

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (Land Use 225), and mid-rise residential with 1st-floor commercial (Land Use 231) are related land uses.

### Additional Data

In prior editions of *Trip Generation Manual*, the mid-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.46 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 95.7 percent of the total dwelling units were occupied.

Time-of-day distribution data for this land use are presented in Appendix A. For the eight general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 4:45 and 5:45 p.m., respectively.

For the four dense multi-use urban sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:15 and 5:15 p.m., respectively. For the three center city core sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 6:45 and 7:45 a.m. and 5:00 and 6:00 p.m., respectively.

For the six sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.46 residents per occupied dwelling unit.

For the five sites for which data were provided for both occupied dwelling units and total dwelling units, an average of 95.7 percent of the units were occupied.

The average numbers of person trips per vehicle trip at the five center city core sites at which both person trip and vehicle trip data were collected were as follows:

- 1.84 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.94 during Weekday, AM Peak Hour of Generator
- 2.07 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.59 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 32 dense multi-use urban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.90 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.90 during Weekday, AM Peak Hour of Generator
- 2.00 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.08 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 13 general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.56 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.88 during Weekday, AM Peak Hour of Generator
- 1.70 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.07 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), British Columbia (CAN), California, Delaware, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, Ontario, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Virginia, and Wisconsin.

### **Source Numbers**

168, 188, 204, 305, 306, 321, 357, 390, 436, 525, 530, 579, 638, 818, 857, 866, 901, 904, 910, 912, 918, 934, 936, 939, 944, 947, 948, 949, 959, 963, 964, 966, 967, 969, 970

# Land Use: 222

## Multifamily Housing (High-Rise)

### Description

High-rise multifamily housing includes apartments, townhouses, and condominiums that have more than 10 levels (floors). They are likely to have one or more elevators. Multifamily housing (low-rise) (Land Use 220), multifamily housing (mid-rise) (Land Use 221), off-campus student apartment (Land Use 225), and high-rise residential with 1st-floor commercial (Land Use 232) are related land uses.

### Additional Data

In prior editions of *Trip Generation Manual*, the high-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the 12 sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 1.57 residents per occupied dwelling unit.

For the 26 sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 98.4 percent of the total dwelling units were occupied.

Time-of-day distribution data for this land use are presented in Appendix A. For the eight dense multi-use sites for which 24-hour time-of-day person trip data were collected, the overall highest vehicle volumes during the AM and PM on a weekday were between 7:30 and 8:30 a.m. and 5:30 and 6:30 p.m., respectively. The Saturday and Sunday peak hours for person trips were between 5:00 and 6:00 p.m. and 4:45 and 5:45 p.m., respectively.

For the six center city core sites for which 24-hour time-of-day person trip data were collected, the overall highest vehicle volumes during the AM and PM on a weekday were between 8:00 and 9:00 a.m. and 6:00 and 7:00 p.m., respectively. The Saturday and Sunday peak hours for person trips were between 11:30 a.m. and 12:30 p.m. and 11:00 a.m. and 12:00 p.m., respectively.

For the 12 sites for which data were provided for both occupied dwelling units and residents, there was an average of 1.57 residents per occupied dwelling unit.

For the 26 sites for which data were provided for both occupied dwelling units and total dwelling units, an average of 98.4 percent of the units were occupied.

The average numbers of person trips per vehicle trip at the three center city core sites at which both person trip and vehicle trip data were collected were as follows:

- 2.52 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 2.70 during Weekday, AM Peak Hour of Generator
- 1.88 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.22 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the six dense multi-use urban sites at which both person trip and vehicle trip data were collected were as follows:

- 2.81 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 2.49 during Weekday, AM Peak Hour of Generator
- 2.17 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.85 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 2000s, and the 2010s in California, District of Columbia, Maryland, New Jersey, New York, Ontario (CAN), Oregon, Pennsylvania, Virginia, and Washington.

### **Source Numbers**

105, 168, 169, 187, 305, 321, 356, 818, 862, 901, 910, 949, 963, 964, 966, 967

# Land Use: 252

## Senior Adult Housing—Attached

### Description

Senior adult housing consists of attached independent living developments, including retirement communities, age-restricted housing, and active adult communities. These developments may include limited social or recreational services. However, they generally lack centralized dining and onsite medical facilities. Residents in these communities live independently, are typically active (requiring little to no medical supervision) and may or may not be retired. Senior adult housing—detached (Land Use 251), congregate care facility (Land Use 253), assisted living (Land Use 254), and continuing care retirement community (Land Use 255) are related uses.

### Additional Data

Time-of-day distribution data for this land use are presented in Appendix A. For the one general urban/suburban site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 12:00 and 1:00 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, and the 2000s in Alberta (CAN), California, Illinois, New Hampshire, New Jersey, New York, and Pennsylvania.

### Source Numbers

272, 501, 576, 602, 703, 734, 741, 902, 970

# **Appendix I:**

## **Trip Distribution Summary**

AM External to Planning District Outbound Trips

Planing District	# of Trips	Assigned Direction	Route Notes
PD 1 of Toronto	391	E	Assumed 50% travel on Hwy 401 and 50% on Hwy 403
PD 2 of Toronto	8		
PD 3 of Toronto	21		
PD 5 of Toronto	12		
PD 6 of Toronto	19		
PD 7 of Toronto	44		
PD 8 of Toronto	79		
PD 9 of Toronto	229		
PD 10 of Toronto	157		
PD 11 of Toronto	105		
PD 12 of Toronto	11		
PD 16 of Toronto	44		
Richmond Hill	25	E	VIA Hwy 401
Markham	45		
Vaughan	166		
Caledon	69		
Brampton	459		
Mississauga	1772	E	Assumed 50% travel on Hwy 401 and 50% on Hwy 403
Halton Hills	82	N	VIA Tremaine Rd
Milton	3816	Internal	Distribution contribution in Internal
Oakville	596	S	VIA Tremaine Rd/Hwy 403
Burlington	131		
Flamborough	44		
Glanbrook	47		
Stoney Creek	7		
Hamilton	19		
Niagara Falls	17		
Cambridge	92	N	Hwy 401 VIA Tremaine Rd
Woolwich	30		
City of Guelph	35		
Erin	10		
Perth	6		
Total	8588		
Total Less Internal	4772		

AM Internal to Planning District Outbound Trips

TAZ	# of Trips	Assigned Direction	Route Notes
4100	9	S	VIA Bronte St S
4103	11	N	VIA LSL/Savoline Blvd
4104	19	E	VIA Whitlock Ave
4105	48	NE	VIA Bronte St S
4108	88	E	VIA LSL
4109	603		
4110	1536	INTERNAL	
4117	51	NE	VIA Bronte St S
4119	182		
4120	68	NE	VIA LSL
4122	22	N	VIA Bronte St S
4123	91	NE	VIA LSL
4124	60		
4125	665	NE	VIA Bronte St S
4126	44		
4130	13	NW	VIA LSL/Tremaine Rd
4138	30		
4144	46	N	VIA LSL/Tremaine Rd
4145	20	NE	VIA LSL/Tremaine Rd
4148	132	NE	VIA LSL
4192	79		
Total	3817		
Total Less Internal	2281		

AM External to Planning District Inbound Trips

Planing District	# of Trips	Assigned Direction	Route Notes
PD 9 of Toronto	14	E	VIA Hwy 401
Vaughan	7		
Mississauga	204	E	Assumed 50% travel on Hwy 401 and 50% on Hwy 403
Halton Hills	43	N	VIA Tremaine Rd
Milton	2298	Internal	Distribution contribution in Internal
Oakville	52	S	VIA Tremaine Rd / Hwy 403
Burlington	103		
Glanbrook	32		
Total	2753		
Total Less Internal	455		

AM Internal to Planning District Inbound Trips

TAZ	# of Trips	Assigned Direction	Route Notes
4103	91	N	VIA LSL/Savoline Blvd
4104	19	E	VIA Whitlock Ave
4105	20	NE	VIA Bronte St S
4108	142	E	VIA LSL
4109	109		
4110	1536	INTERNAL	
4118	74	NE	VIA LSL
4119	33	NE	VIA Bronte St S
4120	78	NE	VIA LSL
4124	22		
4125	97	NE	VIA Bronte St S
4127	59	N	VIA Bronte St S
4148	4	NE	VIA LSL
4192	16		
Total	2300		
Total Less Internal	764		

AM Outbound Distribution

Direction	Route	Number of Trips	Percentage	Local Assignment Direction
N	VIA LSL/Tremaine Rd	364	5%	W
	VIA Bronte St S	1012	14%	N
	VIA LSL	430	6%	E
	VIA LSL/Savoline Blvd	11	0%	N
S	VIA Bronte St S	9	0%	S
	VIA Tremaine Rd/Hwy 403	861	12%	W
E	VIA LSL	691	10%	E
	VIA Whitlock Ave	19	0%	E
	VIA Hwy 401	2210	31%	N
	VIA Hwy 403	1446	21%	S
W	-		0%	-
Total		7053	100%	
Check (Sum of External and Internal Less "Internal" Trips)		7053		

NOTE: The values reported in the summary table in the report represent the summation of the local assignment based on the broader distribution above, the local distribution has been provided above for reference.

AM Inbound Distribution

Direction	Route	Number of Trips	Percentage	Local Assignment Direction
N	VIA LSL/Tremaine Rd	43	4%	W
	VIA Bronte St S	209	17%	N
	VIA LSL	194	16%	E
	VIA LSL/Savoline Blvd	91	7%	N
S	VIA Bronte St S	0	0%	S
	VIA Tremaine Rd/Hwy 403	187	15%	W
E	VIA LSL	251	21%	E
	VIA Whitlock Ave	19	2%	E
	VIA Hwy 401	123	10%	N
	VIA Hwy 403	102	8%	S
W	-		0%	-
Total		1219	100.0%	
Check (Sum of External and Internal Less "Internal" Trips)		1219		

NOTE: The values reported in the summary table in the report represent the summation of the local assignment based on the broader distribution above, the local distribution has been provided above for reference.

PM External to Planning District Outbound Trips

Planing District	# of Trips	Assigned Direction	Route Notes
PD 1 of Toronto	42	E	Assumed 50% travel on 401 and 50% on 403
PD 2 of Toronto	38		
PD 8 of Toronto	10		
PD 9 of Toronto	43		
PD 10 of Toronto	15		
Vaughan	7	E	VIA 401
Mississauga	392	E	Assumed 50% travel on 401 and 50% on 403
Halton Hills	57	N	VIA Tremaine Rd
Milton	1750	Internal	Distribution contribution in Internal
Oakville	185	S	VIA Tremaine Rd/Hwy 403
Burlington	123		
Glanbrook	32		
Hamilton	11		
Niagara Falls	3		
Waterloo	29	W	Hwy 401 VIA Tremaine Rd
Orangeville	38		
Kawartha Lakes	12	N	VIA 401
Total	2787		
Total Less Internal	1037		

PM Internal to Planning District Outbound Trips

TAZ	# of Trips	Assigned Direction	Route Notes
4101	9	W	VIA LSL
4103	41	N	VIA LSL/Savoline Blvd
4104	22	E	VIA Whitlock Ave
4105	210	NE	VIA LSL/Bronte St S
4108	41	E	VIA LSL
4110	519	INTERNAL	
4114	12	E	VIA Bronte St S/Britannia Rd
4117	32	NE	VIA LSL/Bronte St S
4118	39	NE	VIA LSL
4119	245	NE	VIA LSL/Bronte St S
4120	88	NE	VIA LSL
4123	47		
4124	193		
4125	110	NE	VIA LSL/Bronte St S
4126	6		
4127	37	N	VIA LSL/Bronte St S
4133	23	NW	VIA LSL/Tremaine Rd
4139	23		
4144	34	N	VIA LSL/Tremaine Rd
4148	19	NE	VIA LSL
Total	1750		
Total Less Internal	1231		

PM External to Planning District Inbound Trips

Planing District	# of Trips	Assigned Direction	Route Notes
PD 1 of Toronto	366	E	Assumed 50% travel on Hwy 401 and 50% on Hwy 403
PD 2 of Toronto	21		
PD 3 of Toronto	37		
PD 4 of Toronto	12		
PD 5 of Toronto	15		
PD 7 of Toronto	76		
PD 8 of Toronto	52		
PD 9 of Toronto	175		
PD 10 of Toronto	137		
PD 11 of Toronto	105		
PD 16 of Toronto	44		
Richmond Hill	15	E	VIA Hwy 401
Markham	76		
Vaughan	110		
Caledon	69		
Brampton	375		
Mississauga	1381	E	Assumed 50% travel on 401 and 50% on 403
Halton Hills	80	N	VIA Tremaine Rd
Milton	2192	INTERNAL	
Oakville	382	S	VIA Tremaine Rd/Hwy 403
Burlington	165		
Glanbrook	47		
Stoney Creek	11		
Hamilton	37		
Waterloo	9	N	Hwy 401 VIA Tremaine Rd
Cambridge	68		
City of Guelph	35		
Erin	10		
Perth	6		
Total	6108		
Total Less Internal	3916		

PM Internal to Planning District Inbound Trips

TAZ	# of Trips	Assigned Direction	Route Notes
4101	9	W	VIA LSL
4104	11	E	VIA Whitlock Ave
4105	115	NE	VIA LSL/Bronte St S
4108	37	E	VIA LSL
4109	9		
4110	519	INTERNAL	
4117	43	NE	VIA LSL/Bronte St S
4119	396		
4120	89	NE	VIA LSL
4122	44	N	VIA LSL/Bronte St S
4123	92	NE	VIA LSL
4124	211		
4125	117	NE	VIA LSL/Bronte St S
4126	22		
4127	34	N	VIA LSL/Bronte St S
4133	32	NW	VIA LSL/Tremaine Rd
4139	16		
4144	106	N	VIA LSL/Tremaine Rd
4145	10	NE	VIA LSL/Tremaine Rd
4148	225	NE	VIA LSL
4192	55	NE	
Total	2192		
Total Less Internal	1673		

PM Outbound Distribution

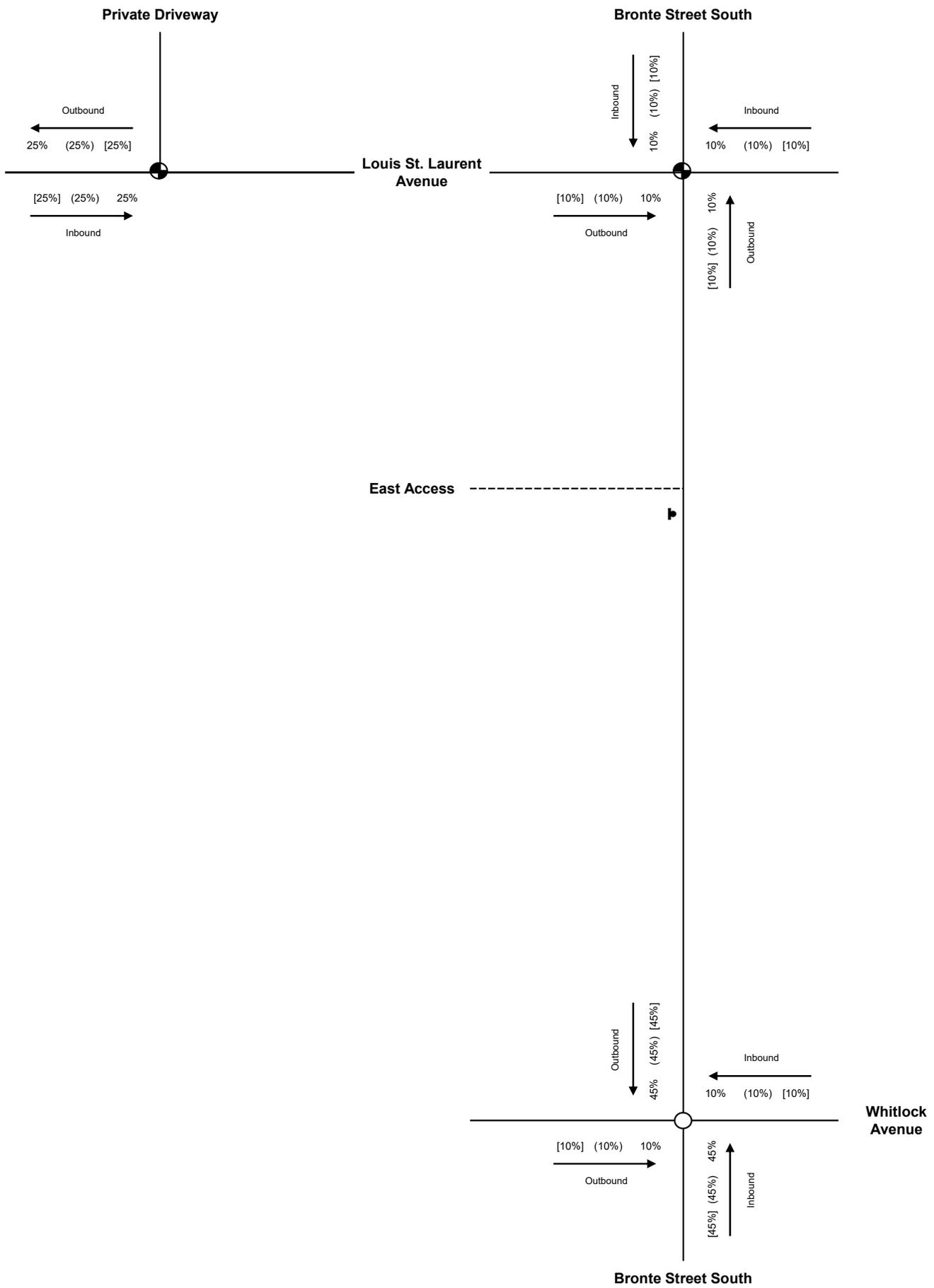
Direction	Route	Number of Trips	Percentage	Local Assignment Direction
N	VIA LSL/Tremaine Rd	137	6%	W
	VIA LSL/Bronte St S	640	28%	N
	VIA LSL	386	17%	E
	VIA Savoline Blvd	41	2%	W
S	VIA Tremaine Rd/Hwy 403	354	16%	W
E	VIA LSL	41	2%	E
	VIA Whitlock Ave	22	1%	E
	VIA Bronte St S/Britannia Rd	12	1%	S
	VIA Hwy 401	289	13%	N
	VIA Hwy 403	270	12%	S
W	VIA LSL	9	0%	-
	Hwy 401	67	3%	N
Total		2268	100%	
Check (Sum of External and Internal Less "Internal" Trips)		2268		

NOTE: The values reported in the summary table in the report represent the summation of the local assignment based on the broader distribution above, the local distribution has been provided above for reference.

PM Inbound Distribution

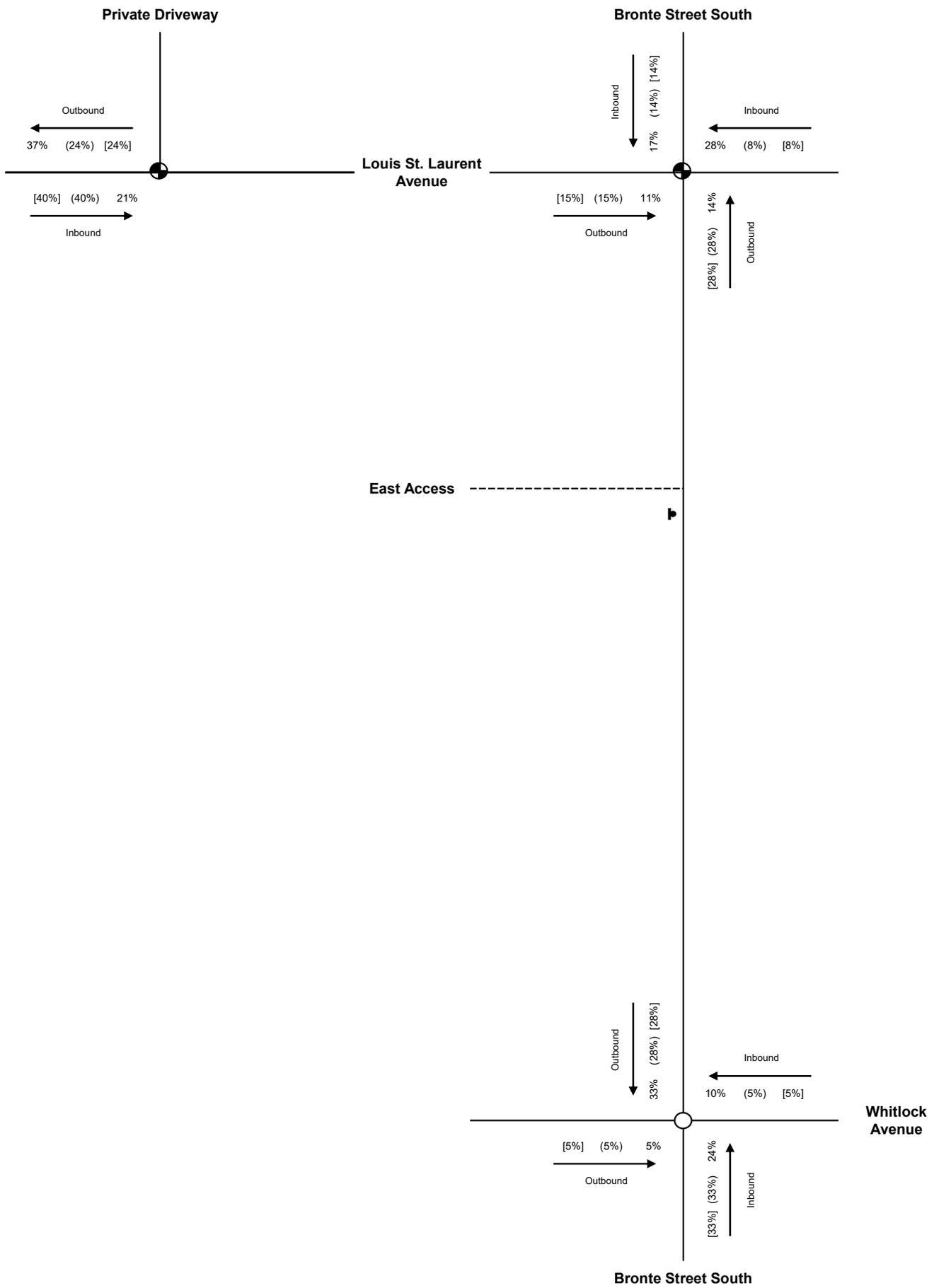
Direction	Route	Number of Trips	Percentage	Local Assignment Direction
N	VIA LSL/Tremaine Rd	254	5%	W
	VIA LSL/Bronte St S	771	14%	N
	VIA LSL	672	12%	E
S	VIA Tremain Rd/Hwy 403	642	11%	W
E	VIA LSL	46	1%	E
	VIA Whitlock Ave	11	0%	E
	VIA Hwy 401	1862	33%	N
	VIA Hwy 403	1211	22%	S
W	VIA LSL	9	0%	W
	Hwy 401	112	2%	N
Total		5589	100%	
Check (Sum of External and Internal Less "Internal" Trips)		5589		

NOTE: The values reported in the summary table in the report represent the summation of the local assignment based on the broader distribution above, the local distribution has been provided above for reference.



**Figure I-1**

**Non-Residential Site Trip Distribution**



**LEGEND**

- XX AM Peak Hour Distribution
- (XX) PM Peak Hour Distribution
- [XX] SAT Peak Hour Distribution
- Signalized Intersection
- Roundabout
- Stop Control

**Figure I-2**

**Residential Site Trip Distribution**

# **Appendix J:**

## Excerpts from Boyne RNA Study

# Executive summary

The purpose of this study is to assess and recommend the road network and associated transportation infrastructure required to support build-out development of the Boyne Tertiary Plan proposed by the Milton Phase 3 Landowners Group.

## Study Scope

This Road Network Assessment has been undertaken in support of the Boyne Tertiary Plan for each of the West and East Blocks, and includes the development of long term 2021 and 2026 travel forecasts on the planned arterial and collector road network. This report summarizes the finding and conclusions from such analysis.

This study also provides an assessment on the continued agricultural use of the property north of Britannia between Thompson Road and Fourth Line.

## Findings of the study

### 1.1.1 Transportation Network - Traffic Assessment

1. Future 2021 and 2026 traffic forecasts were developed to assess the performance of the collector and arterial road network assuming full build-out of the community in 2021. The results indicate that the recommended road network and its connecting intersections to the adjacent arterial road network will operate at appropriate level of service.
2. The configurations at the existing intersections within the study area will be adequate for the future needs, with the following improvements:
  - (i) Bronte Street South at Louis St. Laurent Avenue: Add an eastbound right turn lane (minimum 26 metre storage length) by 2021 and a northbound (minimum 50 metre storage length) and westbound (minimum 30 metre storage length) right turn lane by 2026
  - (ii) James Snow Parkway at Louis St. Laurent Avenue: Add a southbound right turn lane (minimum 140 metre storage length) by 2021
3. The existing Town of Milton and Halton Region capital roads programs and schedules, as well as the road EA recommendations, are generally adequate to meet the functional, capacity, and timing needs of the Boyne Tertiary plan with some exceptions including:
  - (i) Widen to 6 lanes from Britannia Road West to Derry Road by 2026, instead of beginning construction widening in 2027
  - (ii) Regional Road #25 at Louis St. Laurent Avenue: Add eastbound (minimum 70 metre storage length), westbound (minimum 50 metre storage length), northbound (minimum 40 metre storage length) and southbound (minimum 40 metre storage length) right turn lanes by 2021
  - (iii) Regional Road #25 at Britannia Road West: Add eastbound (minimum 60 metre storage length), northbound (minimum 80 metre storage length) and southbound (minimum 25 metre storage length) right turn lanes, plus dual westbound (minimum 100 metre storage length) and northbound (minimum 50 metre storage length) left turn lanes by 2021

# **Appendix K:**

## **Synchro Capacity Analysis Reports**

Timings  
1: Bronte St S & Louis St. Laurent Ave

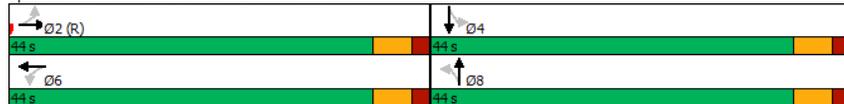
Baseline AM Peak Hour  
06/23/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	89	435	88	257	222	396	184	399
Future Volume (vph)	89	435	88	257	222	396	184	399
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases		2		6		8		4
Detector Phase		2		6		8		4
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	15.0	15.0	15.0	15.0
Minimum Split (s)	36.0	36.0	36.0	36.0	33.0	33.0	33.0	33.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	Max	Max	None	None	None	None
Act Effct Green (s)	46.5	46.5	46.5	46.5	31.5	31.5	31.5	31.5
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.36	0.36	0.36	0.36
v/c Ratio	0.19	0.40	0.30	0.22	0.88	0.42	0.80	0.39
Control Delay	14.9	11.0	18.0	9.2	56.9	19.4	48.3	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	11.0	18.0	9.2	56.9	19.4	48.3	19.7
LOS	B	B	B	A	E	B	D	B
Approach Delay		11.5		10.9		31.1		27.7
Approach LOS		B		B		C		C

Intersection Summary

Cycle Length: 88  
 Actuated Cycle Length: 88  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 20.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 93.1%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

Baseline AM Peak Hour  
06/23/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	89	435	261	88	257	125	222	396	98	184	399	69
Future Volume (vph)	89	435	261	88	257	125	222	396	98	184	399	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		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.98		1.00	0.98		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.98	1.00		0.98	1.00		0.95	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	0.97		1.00	0.98	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	3322		1744	3341		1755	3366		1673	3448	
Fit Permitted	0.51	1.00		0.32	1.00		0.40	1.00		0.38	1.00	
Satd. Flow (perm)	917	3322		592	3341		747	3366		678	3448	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	94	458	275	93	271	132	234	417	103	194	420	73
RTOR Reduction (vph)	0	86	0	0	57	0	0	28	0	0	19	0
Lane Group Flow (vph)	94	647	0	93	346	0	234	492	0	194	474	0
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	4%	1%	2%	3%	2%	2%	3%	2%	2%	4%	3%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases		2			6			8			4	
Actuated Green, G (s)	45.5	45.5		45.5	45.5		30.5	30.5		30.5	30.5	
Effective Green, g (s)	46.5	46.5		46.5	46.5		31.5	31.5		31.5	31.5	
Actuated g/C Ratio	0.53	0.53		0.53	0.53		0.36	0.36		0.36	0.36	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	484	1755		312	1765		267	1204		242	1234	
v/s Ratio Prot		c0.19			0.10			0.15			0.14	
v/s Ratio Perm	0.10			0.16			c0.31			0.29		
v/c Ratio	0.19	0.37		0.30	0.20		0.88	0.41		0.80	0.38	
Uniform Delay, d1	10.9	12.2		11.6	10.9		26.4	21.2		25.4	21.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.6		2.4	0.2		25.8	0.2		17.1	0.2	
Delay (s)	11.8	12.8		14.0	11.2		52.3	21.5		42.6	21.2	
Level of Service	B	B		B	B		D	C		D	C	
Approach Delay (s)		12.6			11.7			31.0			27.3	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay 21.1  
 HCM 2000 Volume to Capacity ratio 0.57  
 Actuated Cycle Length (s) 88.0  
 Intersection Capacity Utilization 93.1%  
 Analysis Period (min) 15

HCM 2000 Level of Service C  
 Sum of lost time (s) 10.0  
 ICU Level of Service F

c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave

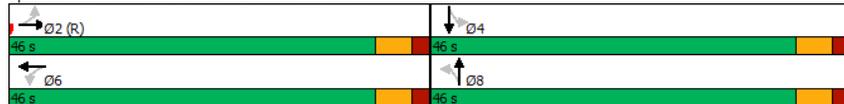
Baseline PM Peak Hour  
06/23/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	137	302	61	364	156	375	143	262
Future Volume (vph)	137	302	61	364	156	375	143	262
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases		2		6		8		4
Detector Phase		2		6		8		4
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	15.0	15.0	15.0	15.0
Minimum Split (s)	36.0	36.0	36.0	36.0	33.0	33.0	33.0	33.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	Max	Max	None	None	None	None
Act Effct Green (s)	59.2	59.2	59.2	59.2	22.8	22.8	22.8	22.8
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.25	0.25	0.25	0.25
v/c Ratio	0.25	0.18	0.10	0.22	0.71	0.47	0.79	0.38
Control Delay	10.2	6.7	8.8	7.1	47.9	29.3	59.8	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	6.7	8.8	7.1	47.9	29.3	59.8	25.0
LOS	B	A	A	A	D	C	E	C
Approach Delay		7.6		7.3		34.5		35.6
Approach LOS		A		A		C		D

Intersection Summary

Cycle Length: 92
Actuated Cycle Length: 92
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 20.8
Intersection Capacity Utilization 86.8%
Analysis Period (min) 15
Intersection LOS: C
ICU Level of Service E

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

Baseline PM Peak Hour  
06/23/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	137	302	100	61	364	122	156	375	28	143	262	65
Future Volume (vph)	137	302	100	61	364	122	156	375	28	143	262	65
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		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.97	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1812	3496		1816	3489		1815	3606		1795	3526	
Fit Permitted	0.46	1.00		0.51	1.00		0.48	1.00		0.40	1.00	
Satd. Flow (perm)	878	3496		969	3489		923	3606		760	3526	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	143	315	104	64	379	127	162	391	29	149	273	68
RTOR Reduction (vph)	0	22	0	0	23	0	0	8	0	0	32	0
Lane Group Flow (vph)	143	397	0	64	483	0	163	412	0	149	309	0
Confl. Peds. (#/hr)	16		10	10		16	9		13	13		9
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases		2			6			8			4	
Actuated Green, G (s)	58.2	58.2		58.2	58.2		21.8	21.8		21.8	21.8	
Effective Green, g (s)	59.2	59.2		59.2	59.2		22.8	22.8		22.8	22.8	
Actuated g/C Ratio	0.64	0.64		0.64	0.64		0.25	0.25		0.25	0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	564	2249		623	2245		228	893		188	873	
v/s Ratio Prot		0.11			0.14			0.11			0.09	
v/s Ratio Perm	c0.16			0.07			0.18			c0.20		
v/c Ratio	0.25	0.18		0.10	0.22		0.71	0.46		0.79	0.35	
Uniform Delay, d1	7.0	6.6		6.3	6.8		31.6	29.4		32.4	28.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.2		0.3	0.2		10.2	0.4		20.1	0.2	
Delay (s)	8.1	6.8		6.6	7.0		41.8	29.8		52.4	28.8	
Level of Service	A	A		A	A		D	C		D	C	
Approach Delay (s)		7.1			7.0			33.1			36.0	
Approach LOS		A			A			C			D	

Intersection Summary

HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave

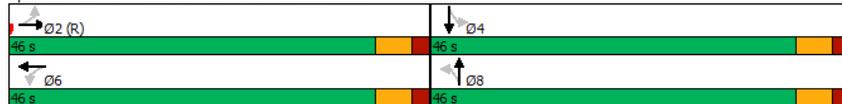
Baseline SAT Peak Hour  
06/23/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	111	252	47	275	72	230	141	249
Future Volume (vph)	111	252	47	275	72	230	141	249
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases		2		6		8		4
Detector Phase		2		6		8		4
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	15.0	15.0	15.0	15.0
Minimum Split (s)	36.0	36.0	36.0	36.0	33.0	33.0	33.0	33.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

	C-Max	C-Max	Max	Max	None	None	None	None
Recall Mode	C-Max	C-Max	Max	Max	None	None	None	None
Act Effct Green (s)	61.9	61.9	61.9	61.9	20.1	20.1	20.1	20.1
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.22	0.22	0.22	0.22
v/c Ratio	0.17	0.14	0.07	0.17	0.38	0.34	0.64	0.41
Control Delay	7.5	5.3	6.8	5.2	34.8	28.4	44.9	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	5.3	6.8	5.2	34.8	28.4	44.9	26.5
LOS	A	A	A	A	C	C	D	C
Approach Delay		5.9		5.3		29.8		32.2
Approach LOS		A		A		C		C

Intersection Summary	
Cycle Length: 92	
Actuated Cycle Length: 92	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

Baseline SAT Peak Hour  
06/23/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	111	252	76	47	275	106	72	230	28	141	249	71
Future Volume (vph)	111	252	76	47	275	106	72	230	28	141	249	71
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		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	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	
Frt	1.00	0.97		1.00	0.96		1.00	0.98		1.00	0.97	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1823	3513		1824	3475		1825	3585		1802	3528	
Fit Permitted	0.52	1.00		0.55	1.00		0.48	1.00		0.55	1.00	
Satd. Flow (perm)	995	3513		1049	3475		913	3585		1049	3528	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	116	262	79	49	286	110	75	240	29	147	259	74
RTOR Reduction (vph)	0	18	0	0	26	0	0	14	0	0	41	0
Lane Group Flow (vph)	116	324	0	49	370	0	75	255	0	147	292	0
Confl. Peds. (#/hr)	2		1	1		2			4	4		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%

	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Actuated Green, G (s)	60.9	60.9	60.9	60.9	19.1	19.1	19.1	19.1
Effective Green, g (s)	61.9	61.9	61.9	61.9	20.1	20.1	20.1	20.1
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.22	0.22	0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	669	2363	705	2338	199	783	229	770
v/s Ratio Prot		0.09		0.11		0.07		0.08
v/s Ratio Perm	c0.12		0.05		0.08		c0.14	
v/c Ratio	0.17	0.14	0.07	0.16	0.38	0.33	0.64	0.38
Uniform Delay, d1	5.6	5.4	5.2	5.5	30.6	30.2	32.7	30.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	0.2	0.1	1.2	0.2	6.0	0.3
Delay (s)	6.1	5.5	5.4	5.7	31.8	30.5	38.7	31.0
Level of Service	A	A	A	A	C	C	D	C
Approach Delay (s)		5.7		5.6		30.8		33.3
Approach LOS		A		A		C		C

Intersection Summary	
HCM 2000 Control Delay	18.4 HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio	0.29
Actuated Cycle Length (s)	92.0 Sum of lost time (s) 10.0
Intersection Capacity Utilization	84.6% ICU Level of Service E
Analysis Period (min)	15

c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave

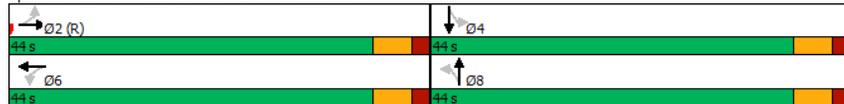
FB 2032 AM Peak Hour - No Opt  
06/24/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	212	879	128	679	366	659	270	636
Future Volume (vph)	212	879	128	679	366	659	270	636
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases		2		6		8		4
Detector Phase		2		6		8		4
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	15.0	15.0	15.0	15.0
Minimum Split (s)	36.0	36.0	36.0	36.0	33.0	33.0	33.0	33.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

	C-Max	C-Max	Max	Max	None	None	None	None
Recall Mode	C-Max	C-Max	Max	Max	None	None	None	None
Act Effect Green (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
v/c Ratio	1.77	0.84	1.61	0.69	1.70	0.56	1.50	0.50
Control Delay	399.4	26.5	346.1	21.1	354.5	19.0	276.4	18.2
Queue Delay	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	399.4	27.2	346.1	21.1	354.5	19.0	276.4	18.2
LOS	F	C	F	C	F	B	F	B
Approach Delay		81.4		58.2		123.8		88.0
Approach LOS		F		E		F		F

Intersection Summary	
Cycle Length: 88	
Actuated Cycle Length: 88	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.77	
Intersection Signal Delay: 87.7	Intersection LOS: F
Intersection Capacity Utilization 112.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

FB 2032 AM Peak Hour - No Opt  
06/24/2025

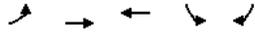
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↔	↔	↕	↕
Traffic Volume (vph)	212	879	364	128	679	317	366	659	145	270	636	93
Future Volume (vph)	212	879	364	128	679	317	366	659	145	270	636	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.98		1.00	0.98		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.97	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.97		1.00	0.98	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1742	3385		1764	3348		1768	3382		1709	3461	
Fit Permitted	0.16	1.00		0.10	1.00		0.28	1.00		0.24	1.00	
Satd. Flow (perm)	286	3385		190	3348		514	3382		429	3461	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	223	925	383	135	715	334	385	694	153	284	669	98
RTOR Reduction (vph)	0	51	0	0	38	0	0	21	0	0	13	0
Lane Group Flow (vph)	223	1257	0	135	1011	0	385	826	0	284	754	0
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	4%	1%	2%	3%	2%	2%	2%	3%	2%	4%	3%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	38.0	38.0		38.0	38.0		38.0	38.0		38.0	38.0	
Effective Green, g (s)	39.0	39.0		39.0	39.0		39.0	39.0		39.0	39.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	1500		84	1483		227	1498		190	1533	
v/s Ratio Prot		0.37			0.30			0.24			0.22	
v/s Ratio Perm	c0.78			0.71			c0.75			0.66		
v/c Ratio	1.77	0.84		1.61	0.68		1.70	0.55		1.49	0.49	
Uniform Delay, d1	24.5	21.7		24.5	19.5		24.5	18.1		24.5	17.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	376.6	5.7		321.4	2.6		331.5	0.4		248.3	0.2	
Delay (s)	401.1	27.4		345.9	22.1		356.0	18.5		272.8	17.7	
Level of Service	F	C		F	C		F	B		F	B	
Approach Delay (s)		81.9			59.0			124.0			86.6	
Approach LOS		F			E			F			F	

Intersection Summary	
HCM 2000 Control Delay	87.8
HCM 2000 Volume to Capacity ratio	1.72
Actuated Cycle Length (s)	88.0
Intersection Capacity Utilization	112.9%
Analysis Period (min)	15
HCM 2000 Level of Service	F
Sum of lost time (s)	10.0
ICU Level of Service	H

c Critical Lane Group

Timings  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 AM Peak Hour - No Opt  
06/24/2025

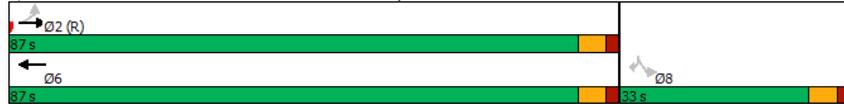


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔
Traffic Volume (vph)	32	1363	1096	88	51
Future Volume (vph)	32	1363	1096	88	51
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	87.0	87.0	87.0	33.0	33.0
Total Split (%)	72.5%	72.5%	72.5%	27.5%	27.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	96.6	96.6	96.6	12.4	12.4
Actuated g/C Ratio	0.80	0.80	0.80	0.10	0.10
v/c Ratio	0.11	0.51	0.43	0.52	0.26
Control Delay	3.8	4.8	4.2	60.9	15.3
Queue Delay	0.0	0.0	0.6	0.0	0.0
Total Delay	3.8	4.8	4.8	60.9	15.3
LOS	A	A	A	E	B
Approach Delay		4.8	4.8	44.3	
Approach LOS		A	A	D	

Intersection Summary

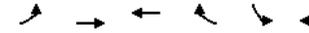
Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.52  
 Intersection Signal Delay: 6.9  
 Intersection Capacity Utilization 55.2%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service B

Splits and Phases: 4: Louis St. Laurent Ave & Private Driveway



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 AM Peak Hour - No Opt  
06/24/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↔
Traffic Volume (vph)	32	1363	1096	40	88	51
Future Volume (vph)	32	1363	1096	40	88	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3560		1789	1601
Fit Permitted	0.21	1.00	1.00		0.95	1.00
Satd. Flow (perm)	391	3579	3560		1789	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	1482	1191	43	96	55
RTOR Reduction (vph)	0	0	1	0	0	49
Lane Group Flow (vph)	35	1482	1233		96	6
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	95.6	95.6	95.6		12.4	12.4
Effective Green, g (s)	96.6	96.6	96.6		12.4	12.4
Actuated g/C Ratio	0.80	0.80	0.80		0.10	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	314	2881	2865		184	165
v/s Ratio Prot		c0.41	0.35			
v/s Ratio Perm	0.09				c0.05	0.00
v/c Ratio	0.11	0.51	0.43		0.52	0.03
Uniform Delay, d1	2.5	3.9	3.5		51.0	48.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	0.7	0.1		2.7	0.1
Delay (s)	3.2	4.6	3.6		53.6	48.5
Level of Service	A	A	A		D	D
Approach Delay (s)		4.5	3.6		51.8	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay: 6.6  
 HCM 2000 Level of Service: A  
 HCM 2000 Volume to Capacity ratio: 0.51  
 Actuated Cycle Length (s): 120.0  
 Sum of lost time (s): 11.0  
 Intersection Capacity Utilization: 55.2%  
 ICU Level of Service: B  
 Analysis Period (min): 15

c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave

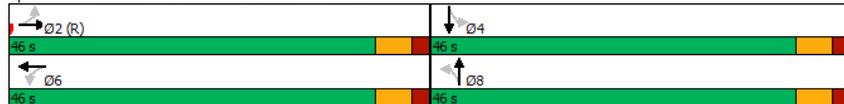
FB 2032 PM Peak Hour - No Opt  
06/24/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	225	796	121	782	331	621	366	513
Future Volume (vph)	225	796	121	782	331	621	366	513
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases		2		6		8		4
Detector Phase		2		6		8		4
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	15.0	15.0	15.0	15.0
Minimum Split (s)	36.0	36.0	36.0	36.0	33.0	33.0	33.0	33.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	Max	Max	None	None	None	None
Act Effct Green (s)	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
v/c Ratio	1.95	0.73	1.22	0.69	1.24	0.47	1.61	0.42
Control Delay	478.1	22.7	189.3	21.9	162.0	18.5	316.2	17.2
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	478.1	23.2	189.3	21.9	162.0	18.5	316.2	17.2
LOS	F	C	F	C	F	B	F	B
Approach Delay		100.2		39.3		64.1		126.6
Approach LOS		F		D		E		F

Intersection Summary

Cycle Length: 92
Actuated Cycle Length: 92
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.95
Intersection Signal Delay: 82.1
Intersection Capacity Utilization 109.1%
Analysis Period (min) 15
Intersection LOS: F
ICU Level of Service H

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

FB 2032 PM Peak Hour - No Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↔	↔	↕	↕
Traffic Volume (vph)	225	796	307	121	782	262	331	621	89	366	513	121
Future Volume (vph)	225	796	307	121	782	262	331	621	89	366	513	121
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		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		0.99	1.00		0.97	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.98		1.00	0.97	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1812	3438		1813	3462		1798	3527		1748	3509	
Fit Permitted	0.14	1.00		0.12	1.00		0.33	1.00		0.29	1.00	
Satd. Flow (perm)	271	3438		232	3462		626	3527		531	3509	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	829	320	126	815	273	345	647	93	381	534	126
RTOR Reduction (vph)	0	44	0	0	35	0	0	12	0	0	22	0
Lane Group Flow (vph)	234	1105	0	126	1053	0	345	728	0	381	638	0
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases		2			6			8			4	
Actuated Green, G (s)	40.0	40.0		40.0	40.0		40.0	40.0		40.0	40.0	
Effective Green, g (s)	41.0	41.0		41.0	41.0		41.0	41.0		41.0	41.0	
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.45	0.45		0.45	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	1532		103	1542		278	1571		236	1563	
v/s Ratio Prot		0.32			0.30			0.21			0.18	
v/s Ratio Perm	c0.86			0.54			0.55			c0.72		
v/c Ratio	1.95	0.72		1.22	0.68		1.24	0.46		1.61	0.41	
Uniform Delay, d1	25.5	20.8		25.5	20.3		25.5	17.8		25.5	17.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	456.3	3.0		160.4	2.5		135.2	0.2		295.3	0.2	
Delay (s)	481.8	23.8		185.9	22.8		160.7	18.0		320.8	17.5	
Level of Service	F	C		F	C		F	B		F	B	
Approach Delay (s)		101.3			39.7			63.4			128.5	
Approach LOS		F			D			E			F	

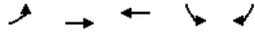
Intersection Summary

HCM 2000 Control Delay	82.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.77		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Timings  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 PM Peak Hour - No Opt  
06/24/2025



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔
Traffic Volume (vph)	63	1255	1122	64	67
Future Volume (vph)	63	1255	1122	64	67
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	90.0	90.0	90.0	30.0	30.0
Total Split (%)	75.0%	75.0%	75.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	97.9	97.9	97.9	11.1	11.1
Actuated g/C Ratio	0.82	0.82	0.82	0.09	0.09
v/c Ratio	0.24	0.47	0.46	0.42	0.34
Control Delay	5.1	4.0	3.9	59.1	15.7
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	5.1	4.0	4.7	59.1	15.7
LOS	A	A	A	E	B
Approach Delay		4.0	4.7	37.0	
Approach LOS		A	A	D	

Intersection Summary

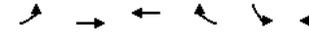
Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.47  
 Intersection Signal Delay: 5.9  
 Intersection Capacity Utilization 69.9%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C

Splits and Phases: 4: Louis St. Laurent Ave & Private Driveway



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 PM Peak Hour - No Opt  
06/24/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↔
Traffic Volume (vph)	63	1255	1122	109	64	67
Future Volume (vph)	63	1255	1122	109	64	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3531		1789	1601
Fit Permitted	0.19	1.00	1.00		0.95	1.00
Satd. Flow (perm)	349	3579	3531		1789	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	1364	1220	118	70	73
RTOR Reduction (vph)	0	0	4	0	0	66
Lane Group Flow (vph)	68	1364	1334	0	70	7
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	96.9	96.9	96.9		11.1	11.1
Effective Green, g (s)	97.9	97.9	97.9		11.1	11.1
Actuated g/C Ratio	0.82	0.82	0.82		0.09	0.09
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	284	2919	2880		165	148
v/s Ratio Prot		c0.38	0.38		c0.04	0.00
v/c Ratio	0.24	0.47	0.46		0.42	0.05
Uniform Delay, d1	2.5	3.3	3.3		51.4	49.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.5	0.1		1.8	0.1
Delay (s)	4.5	3.8	3.4		53.2	49.8
Level of Service	A	A	A		D	D
Approach Delay (s)		3.9	3.4		51.4	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay: 6.0  
 HCM 2000 Volume to Capacity ratio: 0.46  
 Actuated Cycle Length (s): 120.0  
 Intersection Capacity Utilization: 69.9%  
 Analysis Period (min): 15  
 HCM 2000 Level of Service: A  
 Sum of lost time (s): 11.0  
 ICU Level of Service: C  
 c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave

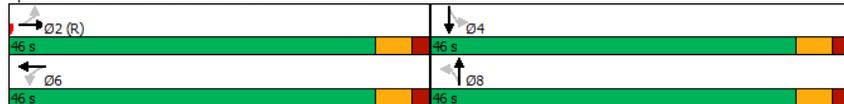
FB 2032 SAT Peak Hour - No Opt  
06/24/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	199	654	86	602	205	385	285	436
Future Volume (vph)	199	654	86	602	205	385	285	436
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases		2		6		8		4
Detector Phase		2		6		8		4
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	15.0	15.0	15.0	15.0
Minimum Split (s)	36.0	36.0	36.0	36.0	33.0	33.0	33.0	33.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Lead/Lag	Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	Max	Max	None	None	None	None
Act Effct Green (s)	44.3	44.3	44.3	44.3	37.7	37.7	37.7	37.7
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.41	0.41	0.41	0.41
v/c Ratio	0.87	0.54	0.44	0.49	0.76	0.33	0.93	0.40
Control Delay	60.1	17.6	26.5	16.9	42.1	17.4	61.9	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	17.6	26.5	16.9	42.1	17.4	61.9	17.7
LOS	E	B	C	B	D	B	E	B
Approach Delay		25.4		17.8		25.1		32.6
Approach LOS		C		B		C		C

**Intersection Summary**  
 Cycle Length: 92  
 Actuated Cycle Length: 92  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 25.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 97.9%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

FB 2032 SAT Peak Hour - No Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↔	↔	↕	↕
Traffic Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	123
Future Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	123
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		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		0.98	1.00		0.95	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.98		1.00	0.97	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3452		1805	3457		1794	3503		1711	3488	
Fit Permitted	0.26	1.00		0.22	1.00		0.36	1.00		0.43	1.00	
Satd. Flow (perm)	493	3452		422	3457		684	3503		782	3488	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	207	681	239	90	627	205	214	401	71	297	454	128
RTOR Reduction (vph)	0	36	0	0	32	0	0	17	0	0	30	0
Lane Group Flow (vph)	207	884	0	90	800	0	214	455	0	297	552	0
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	43.3	43.3		43.3	43.3		36.7	36.7		36.7	36.7	
Effective Green, g (s)	44.3	44.3		44.3	44.3		37.7	37.7		37.7	37.7	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.41	0.41		0.41	0.41	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	237	1662		203	1664		280	1435		320	1429	
v/s Ratio Prot		0.26			0.23			0.13			0.16	
v/s Ratio Perm	c0.42			0.21			0.31			c0.38		
v/c Ratio	0.87	0.53		0.44	0.48		0.76	0.32		0.93	0.39	
Uniform Delay, d1	21.3	16.6		15.7	16.1		23.3	18.4		25.9	19.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	33.1	1.2		6.9	1.0		11.7	0.1		31.9	0.2	
Delay (s)	54.5	17.8		22.6	17.1		35.0	18.5		57.8	19.2	
Level of Service	D	B		C	B		D	B		E	B	
Approach Delay (s)		24.6			17.6			23.7			32.2	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Timings  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 SAT Peak Hour - No Opt  
06/24/2025

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	77	983	800	94	74
Future Volume (vph)	77	983	800	94	74
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	80.0	80.0	80.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	96.3	96.3	96.3	12.7	12.7
Actuated g/C Ratio	0.80	0.80	0.80	0.11	0.11
v/c Ratio	0.21	0.37	0.36	0.54	0.33
Control Delay	4.6	3.9	3.8	61.0	14.0
Queue Delay	0.0	0.0	0.5	0.0	0.0
Total Delay	4.6	3.9	4.2	61.0	14.0
LOS	A	A	A	E	B
Approach Delay		4.0	4.2	40.4	
Approach LOS		A	A	D	

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.54  
 Intersection Signal Delay: 6.9  
 Intersection Capacity Utilization 64.5%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 SAT Peak Hour - No Opt  
06/24/2025

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↔	↕↕
Traffic Volume (vph)	77	983	800	127	94	74
Future Volume (vph)	77	983	800	127	94	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3505		1789	1601
Fit Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	508	3579	3505		1789	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	1068	870	138	102	80
RTOR Reduction (vph)	0	0	6	0	0	72
Lane Group Flow (vph)	84	1068	1002	0	102	8
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	95.3	95.3	95.3		12.7	12.7
Effective Green, g (s)	96.3	96.3	96.3		12.7	12.7
Actuated g/C Ratio	0.80	0.80	0.80		0.11	0.11
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	407	2872	2812		189	169
v/s Ratio Prot		c0.30	0.29			
v/s Ratio Perm	0.17				c0.06	0.01
v/c Ratio	0.21	0.37	0.36		0.54	0.05
Uniform Delay, d1	2.8	3.3	3.3		50.9	48.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.1	0.4	0.1		3.0	0.1
Delay (s)	4.0	3.7	3.4		53.8	48.4
Level of Service	A	A	A		D	D
Approach Delay (s)		3.7	3.4		51.4	
Approach LOS		A	A		D	

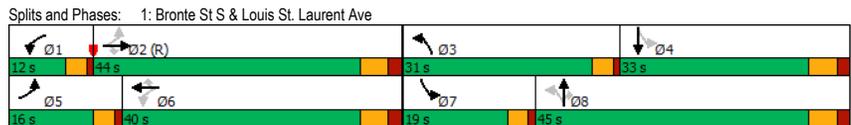
**Intersection Summary**  
 HCM 2000 Control Delay 7.3  
 HCM 2000 Volume to Capacity ratio 0.39  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 64.5%  
 Analysis Period (min) 15  
 HCM 2000 Level of Service A  
 Sum of lost time (s) 11.0  
 ICU Level of Service C

c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave  
FB 2032 AM Peak Hour - STP & Lane Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔
Traffic Volume (vph)	212	879	364	128	679	317	366	659	145	270	636
Future Volume (vph)	212	879	364	128	679	317	366	659	145	270	636
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.0	36.0	36.0	9.0	36.0	36.0	9.0	33.0	33.0	9.0	33.0
Total Split (s)	16.0	44.0	44.0	12.0	40.0	40.0	31.0	45.0	45.0	19.0	33.0
Total Split (%)	13.3%	36.7%	36.7%	10.0%	33.3%	33.3%	25.8%	37.5%	37.5%	15.8%	27.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes										
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None
Act Effct Green (s)	55.1	40.9	39.9	48.4	37.2	36.2	58.9	38.3	37.3	46.3	28.8
Actuated g/C Ratio	0.46	0.34	0.33	0.40	0.31	0.30	0.49	0.32	0.31	0.39	0.24
v/c Ratio	0.72	0.75	0.64	0.62	0.64	0.58	0.88	0.61	0.30	0.78	0.92
Control Delay	35.3	36.4	20.7	33.6	39.6	21.3	51.2	37.0	8.0	36.8	60.4
Queue Delay	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	36.8	20.8	33.6	39.6	21.3	51.2	37.0	8.0	36.8	60.4
LOS	D	D	C	C	D	C	D	D	A	D	E
Approach Delay		32.6			33.8			37.9			54.0
Approach LOS		C			C			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 38.7	Intersection LOS: D
Intersection Capacity Utilization 94.2%	ICU Level of Service F
Analysis Period (min) 15	



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave  
FB 2032 AM Peak Hour - STP & Lane Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	212	879	364	128	679	317	366	659	145	270	636	93
Future Volume (vph)	212	879	364	128	679	317	366	659	145	270	636	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	5.0
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	0.95
Frbp, ped/bikes	1.00	1.00	0.92	1.00	1.00	0.93	1.00	1.00	0.85	1.00	0.85	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	0.99	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00
Fit 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)	1751	3614	1478	1770	3579	1488	1788	3544	1356	1732	3455	95
Fit Permitted	0.19	1.00	1.00	0.14	1.00	1.00	0.13	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	354	3614	1478	256	3579	1488	237	3544	1356	552	3455	95
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	223	925	383	135	715	334	385	694	153	284	669	98
RTOR Reduction (vph)	0	0	111	0	0	124	0	0	94	0	10	0
Lane Group Flow (vph)	223	925	272	135	715	210	385	694	59	284	757	0
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	4%	1%	2%	3%	2%	2%	2%	3%	2%	4%	3%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	51.8	39.9	39.9	44.4	36.2	36.2	55.9	37.3	37.3	42.4	27.8	
Effective Green, g (s)	53.1	40.9	39.9	46.4	37.2	36.2	56.9	38.3	37.3	44.4	28.8	
Actuated g/C Ratio	0.44	0.34	0.33	0.39	0.31	0.30	0.47	0.32	0.31	0.37	0.24	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	
Lane Grp Cap (vph)	306	1231	491	215	1109	448	436	1131	421	357	829	
v/s Ratio Prot	c0.08	c0.26		0.05	0.20		c0.18	0.20		0.10	0.22	
v/s Ratio Perm	0.24		0.18	0.19		0.14	c0.23		0.04	0.19		
v/c Ratio	0.73	0.75	0.55	0.63	0.64	0.47	0.88	0.61	0.14	0.80	0.91	
Uniform Delay, d1	23.8	35.0	32.8	26.8	35.7	34.1	33.1	34.6	29.8	28.8	44.4	
Progression Factor	1.05	0.90	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.8	3.9	4.1	5.6	2.9	3.5	18.6	1.0	0.2	11.6	14.3	
Delay (s)	32.8	35.6	30.9	32.4	38.6	37.6	51.7	35.6	29.9	40.4	58.7	
Level of Service	C	D	C	C	D	D	D	D	C	D	E	
Approach Delay (s)		34.0			37.6			39.9			53.7	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Timings  
4: Louis St. Laurent Ave & Private Driveway

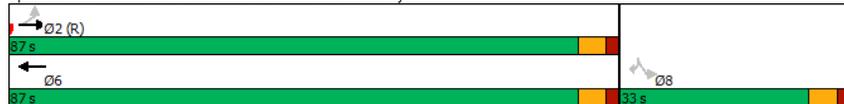
FB 2032 AM Peak Hour - STP & Lane Opt  
06/24/2025

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↕
Traffic Volume (vph)	32	1363	1096	88	51
Future Volume (vph)	32	1363	1096	88	51
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	87.0	87.0	87.0	33.0	33.0
Total Split (%)	72.5%	72.5%	72.5%	27.5%	27.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	97.0	97.0	97.0	12.0	12.0
Actuated g/C Ratio	0.81	0.81	0.81	0.10	0.10
v/c Ratio	0.09	0.47	0.39	0.49	0.25
Control Delay	3.4	4.3	1.7	60.4	16.1
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	3.4	4.3	1.8	60.4	16.1
LOS	A	A	A	E	B
Approach Delay		4.3	1.8	44.1	
Approach LOS		A	A	D	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.49  
 Intersection Signal Delay: 5.3  
 Intersection Capacity Utilization 55.2%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service B

Splits and Phases: 4: Louis St. Laurent Ave & Private Driveway



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 AM Peak Hour - STP & Lane Opt  
06/24/2025

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↕
Traffic Volume (vph)	32	1363	1096	40	88	51
Future Volume (vph)	32	1363	1096	40	88	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3560		1789	1601
Fit Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	440	3579	3560		1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	1363	1096	40	88	51
RTOR Reduction (vph)	0	0	1	0	0	46
Lane Group Flow (vph)	32	1363	1135		88	5
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	96.0	96.0	96.0		12.0	12.0
Effective Green, g (s)	97.0	97.0	97.0		12.0	12.0
Actuated g/C Ratio	0.81	0.81	0.81		0.10	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	355	2893	2877		178	160
v/s Ratio Prot		c0.38	0.32		c0.05	0.00
v/s Ratio Perm	0.07					
v/c Ratio	0.09	0.47	0.39		0.49	0.03
Uniform Delay, d1	2.4	3.6	3.2		51.1	48.8
Progression Factor	1.00	1.00	0.42		1.00	1.00
Incremental Delay, d2	0.5	0.6	0.1		2.2	0.1
Delay (s)	2.9	4.1	1.4		53.3	48.8
Level of Service	A	A	A		D	D
Approach Delay (s)		4.1	1.4		51.7	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay 5.4  
 HCM 2000 Volume to Capacity ratio 0.47  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 55.2%  
 Analysis Period (min) 15  
 HCM 2000 Level of Service A  
 Sum of lost time (s) 11.0  
 ICU Level of Service B

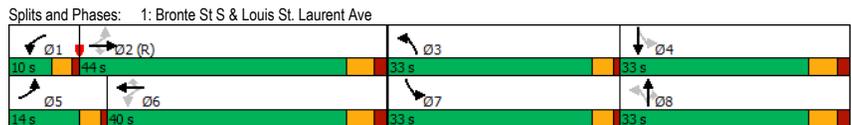
c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave  
FB 2032 PM Peak Hour - STP & Lane Opt  
06/24/2025

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖↖	↖	↖	↖↖
Traffic Volume (vph)	225	796	307	121	782	262	331	621	89	366	513
Future Volume (vph)	225	796	307	121	782	262	331	621	89	366	513
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	3	8	8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.0	36.0	36.0	9.0	36.0	36.0	9.0	33.0	33.0	9.0	33.0
Total Split (s)	14.0	44.0	44.0	10.0	40.0	40.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	11.7%	36.7%	36.7%	8.3%	33.3%	33.3%	27.5%	27.5%	27.5%	27.5%	27.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes										
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None
Act Effct Green (s)	57.2	43.8	42.8	48.6	38.2	37.2	52.2	26.3	25.3	55.5	27.9
Actuated g/C Ratio	0.48	0.36	0.36	0.40	0.32	0.31	0.44	0.22	0.21	0.46	0.23
v/c Ratio	0.75	0.62	0.50	0.48	0.70	0.49	0.79	0.81	0.25	0.85	0.79
Control Delay	41.6	32.2	16.3	26.9	40.7	21.7	40.3	53.1	8.2	47.5	49.6
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	32.3	16.3	26.9	40.7	21.7	40.3	53.1	8.2	47.5	49.6
LOS	D	C	B	C	D	C	D	D	A	D	D
Approach Delay		30.2			35.0			45.2			48.9
Approach LOS		C			C			D			D

**Intersection Summary**

Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
Natural Cycle: 90  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.85  
Intersection Signal Delay: 39.0  
Intersection LOS: D  
Intersection Capacity Utilization 95.1%  
ICU Level of Service F  
Analysis Period (min) 15



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave  
FB 2032 PM Peak Hour - STP & Lane Opt  
06/24/2025

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖↖	↖	↖	↖↖	↖	↖↖
Traffic Volume (vph)	225	796	307	121	782	262	331	621	89	366	513	121	
Future Volume (vph)	225	796	307	121	782	262	331	621	89	366	513	121	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	3.0	5.0
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	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.93	1.00	1.00	0.85	1.00	0.85	1.00	0.99
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	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.97
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1823	3650	1508	1820	3650	1517	1821	3650	1383	1800	3500		
Fit Permitted	0.15	1.00	1.00	0.22	1.00	1.00	0.17	1.00	1.00	0.14	1.00		
Satd. Flow (perm)	284	3650	1508	415	3650	1517	318	3650	1383	272	3500		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	829	320	126	815	273	345	647	93	381	534	126	
RTOR Reduction (vph)	0	0	100	0	0	88	0	0	73	0	17	0	
Lane Group Flow (vph)	234	829	220	126	815	185	345	647	20	381	643	0	
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	NA	
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	3	8	8	4			
Actuated Green, G (s)	54.2	42.8	42.8	44.7	37.3	37.3	48.2	25.3	25.3	51.4	26.9		
Effective Green, g (s)	55.2	43.8	42.8	46.7	38.3	37.3	50.2	26.3	25.3	53.4	27.9		
Actuated g/C Ratio	0.46	0.36	0.36	0.39	0.32	0.31	0.42	0.22	0.21	0.44	0.23		
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0		
Lane Grp Cap (vph)	308	1332	537	259	1164	471	432	799	291	445	813		
v/s Ratio Prot	c0.09	0.23		0.03	0.22		0.16	0.18		c0.18	0.18		
v/s Ratio Perm	c0.26		0.15	0.15		0.12	0.17		0.01	c0.20			
v/c Ratio	0.76	0.62	0.41	0.49	0.70	0.39	0.80	0.81	0.07	0.86	0.79		
Uniform Delay, d1	23.7	31.3	29.1	25.0	35.8	32.5	28.3	44.5	37.9	31.6	43.3		
Progression Factor	1.20	0.92	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	9.7	2.1	2.2	1.4	3.5	2.4	9.9	6.1	0.1	14.9	5.3		
Delay (s)	38.1	30.7	26.1	26.5	39.3	34.9	38.2	50.6	38.0	46.5	48.6		
Level of Service	D	C	C	C	D	C	D	D	D	D	D		
Approach Delay (s)		30.9			37.0			45.6			47.8		
Approach LOS		C			D			D			D		

**Intersection Summary**

HCM 2000 Control Delay 39.6  
HCM 2000 Volume to Capacity ratio 0.84  
Actuated Cycle Length (s) 120.0  
Intersection Capacity Utilization 95.1%  
ICU Level of Service F  
Analysis Period (min) 15  
HCM 2000 Level of Service D  
Sum of lost time (s) 16.0

c Critical Lane Group

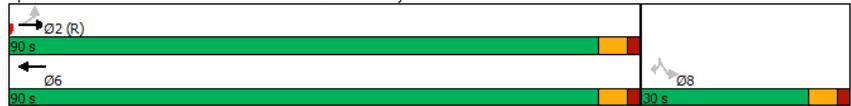
Timings  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 PM Peak Hour - STP & Lane Opt  
06/24/2025

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔
Traffic Volume (vph)	63	1255	1122	64	67
Future Volume (vph)	63	1255	1122	64	67
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	90.0	90.0	90.0	30.0	30.0
Total Split (%)	75.0%	75.0%	75.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	102.3	102.3	102.3	10.9	10.9
Actuated g/C Ratio	0.85	0.85	0.85	0.09	0.09
v/c Ratio	0.18	0.41	0.41	0.40	0.33
Control Delay	3.9	3.2	1.7	58.5	16.1
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	3.9	3.2	1.9	58.5	16.1
LOS	A	A	A	E	B
Approach Delay		3.2	1.9	36.8	
Approach LOS		A	A	D	

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.41  
 Intersection Signal Delay: 4.2  
 Intersection Capacity Utilization 69.9%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C

Splits and Phases: 4: Louis St. Laurent Ave & Private Driveway



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 PM Peak Hour - STP & Lane Opt  
06/24/2025

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↔
Traffic Volume (vph)	63	1255	1122	109	64	67
Future Volume (vph)	63	1255	1122	109	64	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3531		1789	1601
Fit Permitted	0.21	1.00	1.00		0.95	1.00
Satd. Flow (perm)	402	3579	3531		1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	63	1255	1122	109	64	67
RTOR Reduction (vph)	0	0	3	0	0	62
Lane Group Flow (vph)	63	1255	1228	0	64	5
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	99.1	99.1	99.1		8.9	8.9
Effective Green, g (s)	100.1	100.1	100.1		8.9	8.9
Actuated g/C Ratio	0.83	0.83	0.83		0.07	0.07
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	335	2985	2945		132	118
v/s Ratio Prot		c0.35	0.35			
v/s Ratio Perm	0.16				c0.04	0.00
v/c Ratio	0.19	0.42	0.42		0.48	0.04
Uniform Delay, d1	2.0	2.5	2.5		53.3	51.6
Progression Factor	1.00	1.00	0.52		1.00	1.00
Incremental Delay, d2	1.2	0.4	0.1		2.8	0.1
Delay (s)	3.2	3.0	1.4		56.1	51.7
Level of Service	A	A	A		E	D
Approach Delay (s)		3.0	1.4		53.9	
Approach LOS		A	A		D	

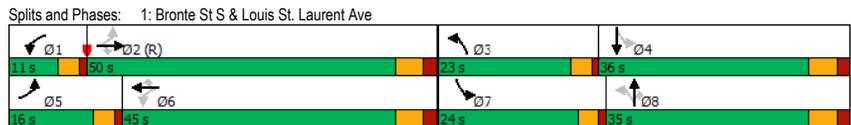
**Intersection Summary**  
 HCM 2000 Control Delay 4.7  
 HCM 2000 Volume to Capacity ratio 0.43  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 69.9%  
 Analysis Period (min) 15  
 HCM 2000 Level of Service A  
 Sum of lost time (s) 11.0  
 ICU Level of Service C

c Critical Lane Group

Timings FB 2032 SAT Peak Hour - STP & Lane Opt  
 1: Bronte St S & Louis St. Laurent Ave 06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	
Traffic Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	
Future Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	15.0	15.0	5.0	15.0	
Minimum Split (s)	11.0	36.0	36.0	11.0	36.0	36.0	11.0	33.0	33.0	11.0	33.0	
Total Split (s)	16.0	50.0	50.0	11.0	45.0	45.0	23.0	35.0	35.0	24.0	36.0	
Total Split (%)	13.3%	41.7%	41.7%	9.2%	37.5%	37.5%	19.2%	29.2%	29.2%	20.0%	30.0%	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	
Total Lost Time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes											
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None	
Act Effct Green (s)	67.2	53.8	52.8	60.5	50.0	49.0	40.5	22.3	21.3	46.2	25.4	
Actuated g/C Ratio	0.56	0.45	0.44	0.50	0.42	0.41	0.34	0.19	0.18	0.38	0.21	
v/c Ratio	0.46	0.42	0.32	0.22	0.41	0.30	0.65	0.59	0.20	0.73	0.77	
Control Delay	15.6	22.4	8.1	15.7	27.4	11.3	34.4	47.8	1.2	36.9	49.2	
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	15.6	22.4	8.1	15.7	27.4	11.3	34.4	47.8	1.2	36.9	49.2	
LOS	B	C	A	B	C	B	C	D	A	D	D	
Approach Delay	18.1			22.7			38.8			45.0		
Approach LOS	B			C			D			D		

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 29.7	Intersection LOS: C
Intersection Capacity Utilization 89.0%	ICU Level of Service E
Analysis Period (min) 15	



HCM Signalized Intersection Capacity Analysis FB 2032 SAT Peak Hour - STP & Lane Opt  
 1: Bronte St S & Louis St. Laurent Ave 06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	123
Future Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	5.0
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	0.95
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.93	1.00	1.00	0.85	1.00	0.85	1.00
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00
Fit 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)	1816	3650	1508	1813	3650	1502	1819	3650	1383	1777	3478	996
Fit Permitted	0.31	1.00	1.00	0.33	1.00	1.00	0.21	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	586	3650	1508	636	3650	1502	409	3650	1383	546	3478	996
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	207	681	239	90	627	205	214	401	71	297	454	128
RTOR Reduction (vph)	0	0	85	0	0	81	0	0	58	0	23	0
Lane Group Flow (vph)	207	681	154	90	627	124	214	401	13	297	559	0
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	64.2	52.8	52.8	56.4	48.9	48.9	36.6	21.3	21.3	42.8	24.4	
Effective Green, g (s)	65.3	53.8	52.8	58.4	49.9	48.9	38.6	22.3	21.3	44.7	25.4	
Actuated g/C Ratio	0.54	0.45	0.44	0.49	0.42	0.41	0.32	0.19	0.18	0.37	0.21	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
Lane Grp Cap (vph)	445	1636	663	392	1517	612	323	678	245	402	736	
v/s Ratio Prot	c0.05	0.19		0.02	0.17		0.09	0.11		c0.12	c0.16	
v/s Ratio Perm	c0.20		0.10	0.10		0.08	0.12		0.01	0.16		
v/c Ratio	0.47	0.42	0.23	0.23	0.41	0.20	0.66	0.59	0.05	0.74	0.76	
Uniform Delay, d1	15.1	22.4	21.0	16.9	24.7	23.0	32.0	44.7	41.0	29.1	44.4	
Progression Factor	0.85	0.90	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.8	0.8	0.3	0.8	0.7	5.0	1.4	0.1	7.0	4.5	
Delay (s)	13.6	21.0	16.3	17.2	25.6	23.7	37.0	46.1	41.1	36.1	49.0	
Level of Service	B	C	B	B	C	C	D	D	D	D	D	
Approach Delay (s)	18.6			24.3			42.7			44.6		
Approach LOS	B			C			D			D		

Intersection Summary	
HCM 2000 Control Delay	31.0 HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.61
Actuated Cycle Length (s)	120.0 Sum of lost time (s) 16.0
Intersection Capacity Utilization	89.0% ICU Level of Service E
Analysis Period (min)	15

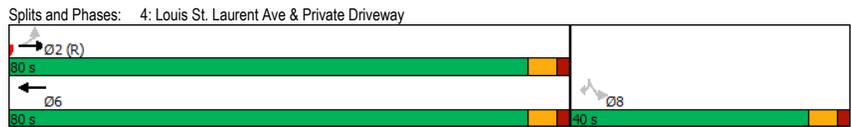
c Critical Lane Group

Timings  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 SAT Peak Hour - STP & Lane Opt  
06/24/2025

	↖	→	←	↙	↘
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↖	↖↖	↖↖	↖	↖
Traffic Volume (vph)	77	983	800	94	74
Future Volume (vph)	77	983	800	94	74
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	80.0	80.0	80.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	96.7	96.7	96.7	12.3	12.3
Actuated g/C Ratio	0.81	0.81	0.81	0.10	0.10
v/c Ratio	0.17	0.34	0.33	0.51	0.32
Control Delay	4.0	3.6	2.3	60.6	14.5
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	4.0	3.6	2.4	60.6	14.5
LOS	A	A	A	E	B
Approach Delay		3.7	2.4	40.3	
Approach LOS		A	A	D	

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.51  
 Intersection Signal Delay: 6.0  
 Intersection Capacity Utilization 64.5%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 SAT Peak Hour - STP & Lane Opt  
06/24/2025

	↖	→	←	↙	↘	
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖↖	↖↖		↖	↖
Traffic Volume (vph)	77	983	800	127	94	74
Future Volume (vph)	77	983	800	127	94	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3505		1789	1601
Flt Permitted	0.30	1.00	1.00		0.95	1.00
Satd. Flow (perm)	558	3579	3505		1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	77	983	800	127	94	74
RTOR Reduction (vph)	0	0	5	0	0	66
Lane Group Flow (vph)	77	983	922		94	8
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	95.7	95.7	95.7		12.3	12.3
Effective Green, g (s)	96.7	96.7	96.7		12.3	12.3
Actuated g/C Ratio	0.81	0.81	0.81		0.10	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	449	2884	2824		183	164
v/s Ratio Prot		c0.27	0.26			
v/s Ratio Perm	0.14				c0.05	0.00
v/c Ratio	0.17	0.34	0.33		0.51	0.05
Uniform Delay, d1	2.6	3.1	3.1		51.0	48.6
Progression Factor	1.00	1.00	0.65		1.00	1.00
Incremental Delay, d2	0.8	0.3	0.1		2.4	0.1
Delay (s)	3.5	3.4	2.1		53.4	48.7
Level of Service	A	A	A		D	D
Approach Delay (s)		3.4	2.1		51.3	
Approach LOS		A	A		D	

**Intersection Summary**  
 HCM 2000 Control Delay 6.6  
 HCM 2000 Volume to Capacity ratio 0.36  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 64.5%  
 Analysis Period (min) 15  
 HCM 2000 Level of Service A  
 Sum of lost time (s) 11.0  
 ICU Level of Service C

c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave

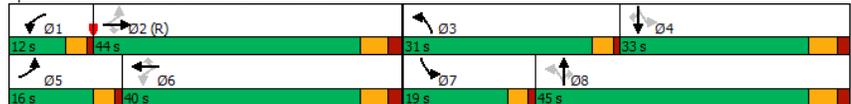
FB 2032 AM Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	212	879	364	128	679	317	366	659	145	270	636	93
Future Volume (vph)	212	879	364	128	679	317	366	659	145	270	636	93
Turn Type	pm+pt	NA	Perm									
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	9.0	36.0	36.0	9.0	36.0	36.0	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	16.0	44.0	44.0	12.0	40.0	40.0	31.0	45.0	45.0	19.0	33.0	33.0
Total Split (%)	13.3%	36.7%	36.7%	10.0%	33.3%	33.3%	25.8%	37.5%	37.5%	15.8%	27.5%	27.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0
Total Lost Time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes											
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	56.7	42.6	41.6	50.2	39.0	38.0	57.2	36.5	35.5	44.6	26.9	25.9
Actuated g/C Ratio	0.47	0.36	0.35	0.42	0.32	0.32	0.48	0.30	0.30	0.37	0.22	0.22
v/c Ratio	0.69	0.72	0.62	0.59	0.62	0.56	0.87	0.64	0.31	0.81	0.84	0.23
Control Delay	32.6	34.6	19.9	30.9	38.0	20.6	50.2	38.7	8.1	40.2	55.2	3.6
Queue Delay	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	34.9	20.0	30.9	38.0	20.6	50.2	38.7	8.1	40.2	55.2	3.6
LOS	C	C	B	C	D	C	D	D	A	D	E	A
Approach Delay		30.9			32.3			38.5			46.4	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 36.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 93.3%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

FB 2032 AM Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	212	879	364	128	679	317	366	659	145	270	636	93
Future Volume (vph)	212	879	364	128	679	317	366	659	145	270	636	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0
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	0.95
Frbp, ped/bikes	1.00	1.00	0.92	1.00	1.00	0.93	1.00	1.00	0.85	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	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
Fit 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)	1751	3614	1478	1770	3579	1488	1787	3544	1356	1733	3544	1509
Fit Permitted	0.20	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	376	3614	1478	279	3579	1488	252	3544	1356	532	3544	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	223	925	383	135	715	334	385	694	153	284	669	98
RTOR Reduction (vph)	0	0	108	0	0	122	0	0	96	0	0	77
Lane Group Flow (vph)	223	925	275	135	715	212	385	694	57	284	669	21
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	4%	1%	2%	3%	2%	2%	2%	3%	2%	4%	3%	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		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	53.4	41.6	41.6	46.2	38.0	38.0	54.2	35.5	35.5	40.6	25.9	25.9
Effective Green, g (s)	54.8	42.6	41.6	48.2	39.0	38.0	55.2	36.5	35.5	42.6	26.9	25.9
Actuated g/C Ratio	0.46	0.36	0.35	0.40	0.32	0.32	0.46	0.30	0.30	0.36	0.22	0.22
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
Lane Grp Cap (vph)	318	1282	512	226	1163	471	439	1077	401	345	794	325
v/s Ratio Prot	c0.07	c0.26		0.05	0.20		c0.18	0.20		0.11	0.19	
v/s Ratio Perm	0.24		0.19	0.19		0.14	c0.22		0.04	0.18		0.01
v/c Ratio	0.70	0.72	0.54	0.60	0.61	0.45	0.88	0.64	0.14	0.82	0.84	0.07
Uniform Delay, d1	22.6	33.6	31.5	25.5	34.2	32.7	32.5	36.1	31.0	30.2	44.5	37.4
Progression Factor	1.03	0.90	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	3.3	3.7	4.2	2.4	3.1	17.6	1.3	0.2	14.6	8.1	0.1
Delay (s)	29.7	33.5	29.3	29.7	36.6	35.8	50.1	37.5	31.2	44.8	52.6	37.5
Level of Service	C	C	C	C	D	D	D	D	C	D	D	D
Approach Delay (s)		31.9			35.6			40.6			49.1	
Approach LOS		C			D			D			D	

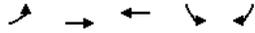
Intersection Summary

HCM 2000 Control Delay 38.5  
 HCM 2000 Volume to Capacity ratio 0.84  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 93.3%  
 ICU Level of Service F  
 Analysis Period (min) 15

c Critical Lane Group

Timings  
4: Louis St. Laurent Ave & Private Driveway

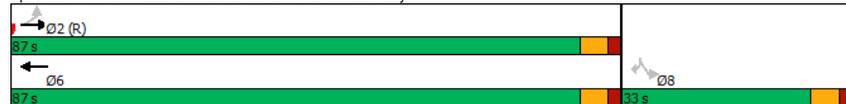
FB 2032 AM Peak Hour - SBR Opt  
06/24/2025



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↗
Traffic Volume (vph)	32	1363	1096	88	51
Future Volume (vph)	32	1363	1096	88	51
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	87.0	87.0	87.0	33.0	33.0
Total Split (%)	72.5%	72.5%	72.5%	27.5%	27.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	97.0	97.0	97.0	12.0	12.0
Actuated g/C Ratio	0.81	0.81	0.81	0.10	0.10
v/c Ratio	0.09	0.47	0.39	0.49	0.25
Control Delay	3.4	4.3	1.1	60.4	16.1
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	3.4	4.3	1.2	60.4	16.1
LOS	A	A	A	E	B
Approach Delay		4.3	1.2	44.1	
Approach LOS		A	A	D	

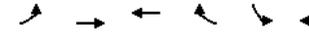
**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.49  
 Intersection Signal Delay: 5.1  
 Intersection Capacity Utilization 55.2%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service B

Splits and Phases: 4: Louis St. Laurent Ave & Private Driveway



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 AM Peak Hour - SBR Opt  
06/24/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↗	↘	↗
Traffic Volume (vph)	32	1363	1096	40	88	51
Future Volume (vph)	32	1363	1096	40	88	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3560		1789	1601
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	440	3579	3560		1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	1363	1096	40	88	51
RTOR Reduction (vph)	0	0	1	0	0	46
Lane Group Flow (vph)	32	1363	1135		88	5
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	96.0	96.0	96.0		12.0	12.0
Effective Green, g (s)	97.0	97.0	97.0		12.0	12.0
Actuated g/C Ratio	0.81	0.81	0.81		0.10	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	355	2893	2877		178	160
v/s Ratio Prot		c0.38	0.32		c0.05	0.00
v/s Ratio Perm	0.07					
v/c Ratio	0.09	0.47	0.39		0.49	0.03
Uniform Delay, d1	2.4	3.6	3.2		51.1	48.8
Progression Factor	1.00	1.00	0.24		1.00	1.00
Incremental Delay, d2	0.5	0.6	0.1		2.2	0.1
Delay (s)	2.9	4.1	0.8		53.3	48.8
Level of Service	A	A	A		D	D
Approach Delay (s)		4.1	0.8		51.7	
Approach LOS		A	A		D	

**Intersection Summary**  
 HCM 2000 Control Delay 5.2  
 HCM 2000 Volume to Capacity ratio 0.47  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 55.2%  
 Analysis Period (min) 15  
 HCM 2000 Level of Service A  
 Sum of lost time (s) 11.0  
 ICU Level of Service B

c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave

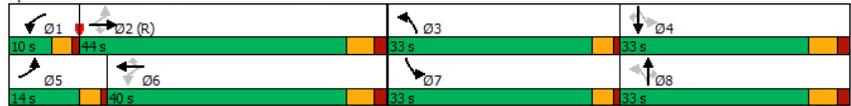
FB 2032 PM Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	225	796	307	121	782	262	331	621	89	366	513	121
Future Volume (vph)	225	796	307	121	782	262	331	621	89	366	513	121
Turn Type	pm+pt	NA	Perm									
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	9.0	36.0	36.0	9.0	36.0	36.0	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	14.0	44.0	44.0	10.0	40.0	40.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	11.7%	36.7%	36.7%	8.3%	33.3%	33.3%	27.5%	27.5%	27.5%	27.5%	27.5%	27.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0
Total Lost Time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes											
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	56.6	43.4	42.4	48.0	37.9	36.9	50.3	26.1	25.1	56.9	30.2	29.2
Actuated g/C Ratio	0.47	0.36	0.35	0.40	0.32	0.31	0.42	0.22	0.21	0.47	0.25	0.24
v/c Ratio	0.76	0.63	0.51	0.49	0.71	0.49	0.72	0.81	0.25	0.83	0.58	0.27
Control Delay	43.5	32.4	16.3	27.6	41.1	21.8	29.0	53.6	8.3	45.3	42.1	7.8
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.5	32.6	16.3	27.6	41.1	21.8	29.0	53.6	8.3	45.3	42.1	7.8
LOS	D	C	B	C	D	C	C	D	A	D	D	A
Approach Delay	30.7			35.3			41.9			39.1		
Approach LOS	C			D			D			D		

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 36.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 95.1%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

FB 2032 PM Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	225	796	307	121	782	262	331	621	89	366	513	121
Future Volume (vph)	225	796	307	121	782	262	331	621	89	366	513	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0
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	0.95
Frbp, ped/bikes	1.00	1.00	0.92	1.00	1.00	0.93	1.00	1.00	0.85	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00	0.85	1.00	1.00	0.85
Fit 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)	1823	3650	1508	1820	3650	1517	1813	3650	1383	1801	3650	1524
Fit Permitted	0.14	1.00	1.00	0.21	1.00	1.00	0.32	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	278	3650	1508	410	3650	1517	616	3650	1383	261	3650	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	829	320	126	815	273	345	647	93	381	534	126
RTOR Reduction (vph)	0	0	100	0	0	89	0	0	74	0	0	95
Lane Group Flow (vph)	234	829	220	126	815	184	345	647	19	381	534	31
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA	Perm									
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	53.6	42.4	42.4	44.1	36.9	36.9	46.3	25.1	25.1	54.4	29.2	29.2
Effective Green, g (s)	54.6	43.4	42.4	46.1	37.9	36.9	48.3	26.1	25.1	55.4	30.2	29.2
Actuated g/C Ratio	0.46	0.36	0.35	0.38	0.32	0.31	0.40	0.22	0.21	0.46	0.25	0.24
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	302	1320	532	253	1152	466	469	793	289	458	918	370
v/s Ratio Prot	c0.09	0.23		0.03	0.22		0.14	0.18		c0.18	0.15	
v/s Ratio Perm	c0.26		0.15	0.16		0.12	0.16		0.01	c0.20		0.02
v/c Ratio	0.77	0.63	0.41	0.50	0.71	0.40	0.74	0.82	0.07	0.83	0.58	0.08
Uniform Delay, d1	24.1	31.6	29.4	25.5	36.2	32.8	26.8	44.7	38.1	31.2	39.4	35.1
Progression Factor	1.21	0.92	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	2.1	2.2	1.5	3.7	2.5	5.9	6.5	0.1	12.2	0.9	0.1
Delay (s)	40.3	31.1	26.4	27.0	39.8	35.3	32.8	51.2	38.2	43.4	40.3	35.2
Level of Service	D	C	C	C	D	D	C	D	D	D	D	D
Approach Delay (s)	31.6			37.5			44.2			40.8		
Approach LOS	C			D			D			D		

Intersection Summary

HCM 2000 Control Delay 38.0  
 HCM 2000 Volume to Capacity ratio 0.84  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 95.1%  
 ICU Level of Service F  
 Analysis Period (min) 15

c Critical Lane Group

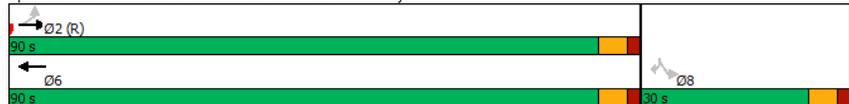
Timings  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 PM Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔
Traffic Volume (vph)	63	1255	1122	64	67
Future Volume (vph)	63	1255	1122	64	67
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	90.0	90.0	90.0	30.0	30.0
Total Split (%)	75.0%	75.0%	75.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	102.3	102.3	102.3	10.9	10.9
Actuated g/C Ratio	0.85	0.85	0.85	0.09	0.09
v/c Ratio	0.18	0.41	0.41	0.40	0.33
Control Delay	3.9	3.2	1.5	58.5	16.1
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	3.9	3.2	1.7	58.5	16.1
LOS	A	A	A	E	B
Approach Delay		3.2	1.7	36.8	
Approach LOS		A	A	D	

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.41  
 Intersection Signal Delay: 4.2  
 Intersection Capacity Utilization 69.9%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C

Splits and Phases: 4: Louis St. Laurent Ave & Private Driveway



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 PM Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	WBT	WBR	SBL	SBR
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↔
Traffic Volume (vph)	63	1255	1122	109	64	67
Future Volume (vph)	63	1255	1122	109	64	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3531		1789	1601
Fit Permitted	0.21	1.00	1.00		0.95	1.00
Satd. Flow (perm)	402	3579	3531		1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	63	1255	1122	109	64	67
RTOR Reduction (vph)	0	0	3	0	0	62
Lane Group Flow (vph)	63	1255	1228	0	64	5
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	99.1	99.1	99.1		8.9	8.9
Effective Green, g (s)	100.1	100.1	100.1		8.9	8.9
Actuated g/C Ratio	0.83	0.83	0.83		0.07	0.07
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	335	2985	2945		132	118
v/s Ratio Prot		c0.35	0.35			
v/s Ratio Perm	0.16				c0.04	0.00
v/c Ratio	0.19	0.42	0.42		0.48	0.04
Uniform Delay, d1	2.0	2.5	2.5		53.3	51.6
Progression Factor	1.00	1.00	0.44		1.00	1.00
Incremental Delay, d2	1.2	0.4	0.1		2.8	0.1
Delay (s)	3.2	3.0	1.2		56.1	51.7
Level of Service	A	A	A		E	D
Approach Delay (s)		3.0	1.2		53.9	
Approach LOS		A	A		D	

**Intersection Summary**  
 HCM 2000 Control Delay 4.6  
 HCM 2000 Volume to Capacity ratio 0.43  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 69.9%  
 Analysis Period (min) 15  
 HCM 2000 Level of Service A  
 Sum of lost time (s) 11.0  
 ICU Level of Service C  
 c Critical Lane Group

Timings  
1: Bronte St S & Louis St. Laurent Ave

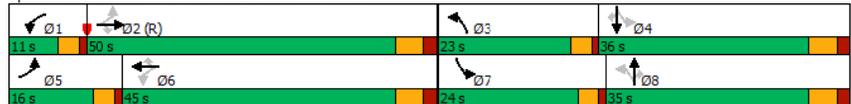
FB 2032 SAT Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	123
Future Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	123
Turn Type	pm+pt	NA	Perm									
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2	2	6	2	6	6	8	8	8	4	4	4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	11.0	36.0	36.0	11.0	36.0	36.0	11.0	33.0	33.0	11.0	33.0	33.0
Total Split (s)	16.0	50.0	50.0	11.0	45.0	45.0	23.0	35.0	35.0	24.0	36.0	36.0
Total Split (%)	13.3%	41.7%	41.7%	9.2%	37.5%	37.5%	19.2%	29.2%	29.2%	20.0%	30.0%	30.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0
Total Lost Time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes											
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	69.1	55.1	54.1	62.5	51.3	50.3	38.5	20.1	19.1	44.2	23.2	22.2
Actuated g/C Ratio	0.58	0.46	0.45	0.52	0.43	0.42	0.32	0.17	0.16	0.37	0.19	0.18
v/c Ratio	0.44	0.41	0.31	0.21	0.40	0.29	0.59	0.66	0.21	0.76	0.64	0.33
Control Delay	14.2	21.4	7.6	14.2	26.3	10.8	33.1	51.8	1.5	40.7	48.9	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	21.4	7.6	14.2	26.3	10.8	33.1	51.8	1.5	40.7	48.9	8.1
LOS	B	C	A	B	C	B	C	D	A	D	D	A
Approach Delay	17.1			21.7			40.8			40.2		
Approach LOS	B			C			D			D		

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 28.4  
 Intersection Capacity Utilization 89.0%  
 Analysis Period (min) 15

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
1: Bronte St S & Louis St. Laurent Ave

FB 2032 SAT Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	123
Future Volume (vph)	199	654	229	86	602	197	205	385	68	285	436	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0
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
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.93	1.00	1.00	1.00	0.85	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	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
Fit 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)	1815	3650	1508	1813	3650	1502	1811	3650	1383	1780	3650	1524
Fit Permitted	0.31	1.00	1.00	0.34	1.00	1.00	0.33	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	595	3650	1508	642	3650	1502	622	3650	1383	495	3650	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	207	681	239	90	627	205	214	401	71	297	454	128
RTOR Reduction (vph)	0	0	84	0	0	79	0	0	60	0	0	104
Lane Group Flow (vph)	207	681	155	90	627	126	214	401	11	297	454	24
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA	Perm									
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2	2	6	2	6	6	8	8	8	4	4	4
Actuated Green, G (s)	66.1	54.0	54.0	58.5	50.2	50.2	34.6	19.1	19.1	40.8	22.2	22.2
Effective Green, g (s)	67.3	55.0	54.0	60.5	51.2	50.2	36.6	20.1	19.1	42.7	23.2	22.2
Actuated g/C Ratio	0.56	0.46	0.45	0.50	0.43	0.42	0.31	0.17	0.16	0.36	0.19	0.18
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
Lane Grp Cap (vph)	466	1672	678	414	1557	628	353	611	220	386	705	281
v/s Ratio Prot	c0.05	0.19		0.02	0.17		0.08	0.11		c0.13	0.12	
v/s Ratio Perm	c0.20		0.10	0.09		0.08	0.10		0.01	c0.15		0.02
v/c Ratio	0.44	0.41	0.23	0.22	0.40	0.20	0.61	0.66	0.05	0.77	0.64	0.08
Uniform Delay, d1	14.1	21.6	20.2	15.8	23.8	22.2	33.1	46.7	42.8	30.6	44.6	40.5
Progression Factor	0.86	0.90	0.73	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.7	0.8	0.3	0.8	0.7	2.9	2.5	0.1	8.9	2.0	0.1
Delay (s)	12.7	20.1	15.4	16.0	24.6	22.9	36.0	49.3	42.9	39.6	46.6	40.6
Level of Service	B	C	B	B	C	C	D	D	D	D	D	D
Approach Delay (s)	17.8			23.4			44.5			43.4		
Approach LOS	B			C			D			D		

Intersection Summary

HCM 2000 Control Delay 30.5  
 HCM 2000 Volume to Capacity ratio 0.60  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 89.0%  
 Analysis Period (min) 15

c Critical Lane Group

Timings  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 SAT Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	77	983	800	94	74
Future Volume (vph)	77	983	800	94	74
Turn Type	Perm	NA	NA	Perm	Perm
Protected Phases		2	6		
Permitted Phases	2			8	8
Detector Phase	2	2	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	30.0	30.0
Total Split (s)	80.0	80.0	80.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	96.7	96.7	96.7	12.3	12.3
Actuated g/C Ratio	0.81	0.81	0.81	0.10	0.10
v/c Ratio	0.17	0.34	0.33	0.51	0.32
Control Delay	4.0	3.6	1.4	60.6	14.5
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	4.0	3.6	1.5	60.6	14.5
LOS	A	A	A	E	B
Approach Delay		3.7	1.5	40.3	
Approach LOS		A	A	D	

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.51  
 Intersection Signal Delay: 5.6  
 Intersection Capacity Utilization 64.5%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C



HCM Signalized Intersection Capacity Analysis  
4: Louis St. Laurent Ave & Private Driveway

FB 2032 SAT Peak Hour - SBR Opt  
06/24/2025

	EBL	EBT	WBT	WBR	SBL	SBR
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↔	↕↕
Traffic Volume (vph)	77	983	800	127	94	74
Future Volume (vph)	77	983	800	127	94	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1789	3579	3505		1789	1601
Flt Permitted	0.30	1.00	1.00		0.95	1.00
Satd. Flow (perm)	558	3579	3505		1789	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	77	983	800	127	94	74
RTOR Reduction (vph)	0	0	5	0	0	66
Lane Group Flow (vph)	77	983	922		94	8
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				8	8
Actuated Green, G (s)	95.7	95.7	95.7		12.3	12.3
Effective Green, g (s)	96.7	96.7	96.7		12.3	12.3
Actuated g/C Ratio	0.81	0.81	0.81		0.10	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	449	2884	2824		183	164
v/s Ratio Prot		c0.27	0.26			
v/s Ratio Perm	0.14				c0.05	0.00
v/c Ratio	0.17	0.34	0.33		0.51	0.05
Uniform Delay, d1	2.6	3.1	3.1		51.0	48.6
Progression Factor	1.00	1.00	0.36		1.00	1.00
Incremental Delay, d2	0.8	0.3	0.1		2.4	0.1
Delay (s)	3.5	3.4	1.2		53.4	48.7
Level of Service	A	A	A		D	D
Approach Delay (s)		3.4	1.2		51.3	
Approach LOS		A	A		D	

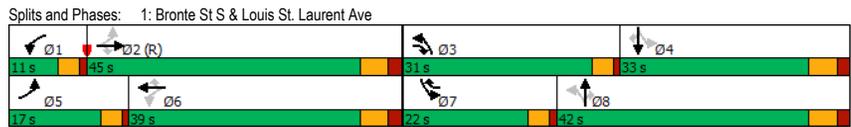
**Intersection Summary**  
 HCM 2000 Control Delay 6.2  
 HCM 2000 Volume to Capacity ratio 0.36  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 64.5%  
 Analysis Period (min) 15  
 HCM 2000 Level of Service A  
 Sum of lost time (s) 11.0  
 ICU Level of Service C

c Critical Lane Group

Timings FT 2032 AM Peak Hour  
 1: Bronte St S & Louis St. Laurent Ave 06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	227	902	370	139	705	317	386	685	157	270	649	110
Future Volume (vph)	227	902	370	139	705	317	386	685	157	270	649	110
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6	7	3	8		7	4	
Permitted Phases	2	2	6	6	8	8	8	8	4	4	4	4
Detector Phase	5	2	3	1	6	7	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	5.0	5.0	20.0	5.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	9.0	36.0	9.0	9.0	36.0	9.0	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	17.0	45.0	31.0	11.0	39.0	22.0	31.0	42.0	42.0	22.0	33.0	33.0
Total Split (%)	14.2%	37.5%	25.8%	9.2%	32.5%	18.3%	25.8%	35.0%	35.0%	18.3%	27.5%	27.5%
Yellow Time (s)	3.0	4.0	3.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0
Total Lost Time (s)	3.0	5.0	4.0	3.0	5.0	4.0	3.0	5.0	6.0	3.0	5.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes											
Recall Mode	None	C-Max	None	None	Max	None						
Act Effct Green (s)	55.8	42.0	68.2	47.7	36.9	54.1	58.2	36.0	35.0	46.2	27.0	26.0
Actuated g/C Ratio	0.46	0.35	0.57	0.40	0.31	0.45	0.48	0.30	0.29	0.38	0.22	0.22
v/c Ratio	0.76	0.75	0.44	0.69	0.67	0.44	0.89	0.68	0.34	0.78	0.86	0.25
Control Delay	42.5	28.3	4.1	39.5	40.8	13.8	53.3	40.5	9.9	37.7	56.2	2.5
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	28.8	4.1	39.5	40.8	13.8	53.3	40.5	9.9	37.7	56.2	2.5
LOS	D	C	A	D	D	B	D	D	A	D	E	A
Approach Delay	24.8			33.3			40.6			45.6		
Approach LOS	C			C			D			D		

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 35.1 Intersection LOS: D  
 Intersection Capacity Utilization 95.3% ICU Level of Service F  
 Analysis Period (min) 15



HCM Signalized Intersection Capacity Analysis FT 2032 AM Peak Hour  
 1: Bronte St S & Louis St. Laurent Ave 06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	227	902	370	139	705	317	386	685	157	270	649	110
Future Volume (vph)	227	902	370	139	705	317	386	685	157	270	649	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	4.0	3.0	5.0	4.0	3.0	5.0	6.0	3.0	5.0	6.0
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	0.95
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.85	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	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
Fit 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)	1752	3614	1525	1770	3579	1523	1787	3544	1356	1738	3544	1509
Fit Permitted	0.17	1.00	1.00	0.14	1.00	1.00	0.13	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	323	3614	1525	259	3579	1523	251	3544	1356	475	3544	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	239	949	389	146	742	334	406	721	165	284	683	116
RTOR Reduction (vph)	0	0	29	0	0	77	0	0	97	0	0	91
Lane Group Flow (vph)	239	949	360	146	742	257	406	721	68	284	683	25
Confl. Peds. (#/hr)	50		55	55		50	42		108	108		42
Heavy Vehicles (%)	4%	1%	2%	3%	2%	2%	3%	2%	4%	3%	3%	1%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6	7	3	8		7	4	
Permitted Phases	2	2	6	6	8	8	8	8	4	4	4	4
Actuated Green, G (s)	52.8	41.0	66.2	43.7	35.9	52.1	55.2	35.0	35.0	42.2	26.0	26.0
Effective Green, g (s)	53.8	42.0	66.2	45.7	36.9	52.1	56.2	36.0	35.0	44.2	27.0	26.0
Actuated g/C Ratio	0.45	0.35	0.55	0.38	0.31	0.43	0.47	0.30	0.29	0.37	0.22	0.22
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	4.0	3.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	310	1264	841	209	1100	661	452	1063	395	355	797	326
v/s Ratio Prot	c0.09	0.26	0.09	0.05	0.21	0.05	c0.20	0.20		0.11	0.19	
v/s Ratio Perm	c0.26		0.15	0.21		0.12	c0.22		0.05	0.18		0.02
v/c Ratio	0.77	0.75	0.43	0.70	0.67	0.39	0.90	0.68	0.17	0.80	0.86	0.08
Uniform Delay, d1	24.0	34.4	15.8	27.3	36.3	23.1	33.1	36.9	31.7	29.1	44.6	37.4
Progression Factor	1.34	0.70	0.26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.5	3.5	0.3	9.8	3.3	0.4	20.1	1.7	0.2	12.2	9.0	0.1
Delay (s)	41.7	27.7	4.4	37.0	39.6	23.5	53.2	38.6	31.9	41.3	53.7	37.5
Level of Service	D	C	A	D	D	C	D	D	C	D	D	D
Approach Delay (s)	24.1			34.9			42.4			48.7		
Approach LOS	C			C			D			D		

**Intersection Summary**  
 HCM 2000 Control Delay 36.3 HCM 2000 Level of Service D  
 HCM 2000 Volume to Capacity ratio 0.88  
 Actuated Cycle Length (s) 120.0 Sum of lost time (s) 17.0  
 Intersection Capacity Utilization 95.3% ICU Level of Service F  
 Analysis Period (min) 15  
 c Critical Lane Group

Timings  
4: North Access 1/Private Driveway & Louis St. Laurent Ave

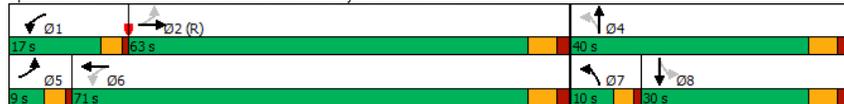
FT 2032 AM Peak Hour  
06/24/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	32	1369	51	1108	94	0	88	0
Future Volume (vph)	32	1369	51	1108	94	0	88	0
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2	1	6	7	4		8
Permitted Phases	2	6	4		8			
Detector Phase	5	2	1	6	7	4	8	8
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.0	26.0	9.0	26.0	9.0	30.0	30.0	30.0
Total Split (s)	9.0	63.0	17.0	71.0	10.0	40.0	30.0	30.0
Total Split (%)	7.5%	52.5%	14.2%	59.2%	8.3%	33.3%	25.0%	25.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	4.0	5.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	None	None	None	None	None	None
Act Effct Green (s)	84.7	76.9	84.4	79.2	25.5	23.5	13.5	13.5
Actuated g/C Ratio	0.71	0.64	0.70	0.66	0.21	0.20	0.11	0.11
v/c Ratio	0.09	0.62	0.21	0.49	0.36	0.08	0.57	0.15
Control Delay	5.8	15.5	8.1	10.7	42.5	0.4	64.2	0.9
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	5.8	15.5	8.1	10.8	42.5	0.4	64.2	0.9
LOS	A	B	A	B	D	A	E	A
Approach Delay		15.3		10.7		30.4		41.0
Approach LOS		B		B		C		D

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.62  
 Intersection Signal Delay: 15.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 63.4%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 4: North Access 1/Private Driveway & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
4: North Access 1/Private Driveway & Louis St. Laurent Ave

FT 2032 AM Peak Hour  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↔	↔	↕	↕
Traffic Volume (vph)	32	1369	54	51	1108	40	94	0	38	88	0	51
Future Volume (vph)	32	1369	54	51	1108	40	94	0	38	88	0	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		4.0	5.0		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	3558		1789	3560		1789	1601		1789	1601	
Fit Permitted	0.20	1.00		0.12	1.00		0.56	1.00		0.73	1.00	
Satd. Flow (perm)	374	3558		225	3560		1052	1601		1379	1601	
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)	32	1369	54	51	1108	40	94	0	38	88	0	51
RTOR Reduction (vph)	0	2	0	0	2	0	0	31	0	0	45	0
Lane Group Flow (vph)	32	1421	0	51	1146	0	94	7	0	88	6	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	79.0	75.1		82.0	76.6		23.5	23.5		13.5	13.5	
Effective Green, g (s)	81.0	76.1		82.0	77.6		23.5	23.5		13.5	13.5	
Actuated g/C Ratio	0.68	0.63		0.68	0.65		0.20	0.20		0.11	0.11	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	310	2256		224	2302		242	313		155	180	
v/s Ratio Prot	0.00	c0.40		c0.01	0.32		c0.02	0.00			0.00	
v/s Ratio Perm	0.07			0.15			0.06			c0.06		
v/c Ratio	0.10	0.63		0.23	0.50		0.39	0.02		0.57	0.03	
Uniform Delay, d1	7.4	13.4		10.0	11.0		41.0	39.0		50.5	47.4	
Progression Factor	1.00	1.00		1.19	0.88		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.3		0.4	0.1		1.0	0.0		4.7	0.1	
Delay (s)	7.6	14.7		12.2	9.9		42.1	39.0		55.2	47.5	
Level of Service	A	B		B	A		D	D		E	D	
Approach Delay (s)		14.6			10.0			41.2			52.4	
Approach LOS		B			A			D			D	

Intersection Summary

HCM 2000 Control Delay 15.7  
 HCM 2000 Level of Service B  
 HCM 2000 Volume to Capacity ratio 0.59  
 Actuated Cycle Length (s) 120.0  
 Sum of lost time (s) 19.0  
 Intersection Capacity Utilization 63.4%  
 ICU Level of Service B  
 Analysis Period (min) 15

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
5: Bronte St S & East Access

FT 2032 AM Peak Hour  
06/24/2025

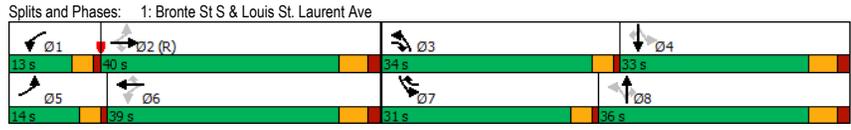


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑↑	↑↑	
Traffic Volume (veh/h)	0	24	0	1264	1104	30
Future Volume (Veh/h)	0	24	0	1264	1104	30
Sign Control	Stop			Free		Free
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	27	0	1404	1227	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)	156					
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	1946	630	1260			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1708	97	868			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	100			
cM capacity (veh/h)	67	768	630			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	27	702	702	818	442	
Volume Left	0	0	0	0	0	
Volume Right	27	0	0	0	33	
cSH	768	1700	1700	1700	1700	
Volume to Capacity	0.04	0.41	0.41	0.48	0.26	
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	
Lane LOS	A					
Approach Delay (s)	9.9	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.1					
Intersection Capacity Utilization	41.5%		ICU Level of Service		A	
Analysis Period (min)	15					

Timings FT 2032 PM Peak Hour  
 1: Bronte St S & Louis St. Laurent Ave 06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	252	827	328	128	811	262	347	637	95	366	533	145
Future Volume (vph)	252	827	328	128	811	262	347	637	95	366	533	145
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6	7	3	8		7	4	
Permitted Phases	2	2	6	6	8	8	8	8	4	4	4	4
Detector Phase	5	2	3	1	6	7	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	5.0	5.0	20.0	5.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	9.0	36.0	9.0	9.0	36.0	9.0	9.0	33.0	33.0	9.0	33.0	33.0
Total Split (s)	14.0	40.0	34.0	13.0	39.0	31.0	34.0	36.0	36.0	31.0	33.0	33.0
Total Split (%)	11.7%	33.3%	28.3%	10.8%	32.5%	25.8%	28.3%	30.0%	30.0%	25.8%	27.5%	27.5%
Yellow Time (s)	3.0	4.0	3.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0
Total Lost Time (s)	3.0	5.0	4.0	3.0	5.0	4.0	3.0	5.0	6.0	3.0	5.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes											
Recall Mode	None	C-Max	None	None	Max	None						
Act Effct Green (s)	55.8	41.7	65.7	46.3	34.3	59.1	53.6	27.7	26.7	55.1	28.4	27.4
Actuated g/C Ratio	0.46	0.35	0.55	0.39	0.29	0.49	0.45	0.23	0.22	0.46	0.24	0.23
v/c Ratio	0.80	0.68	0.37	0.50	0.81	0.33	0.75	0.79	0.23	0.86	0.64	0.32
Control Delay	57.3	30.4	2.3	27.4	47.1	13.0	30.3	50.7	8.1	48.8	44.8	8.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	30.6	2.3	27.4	47.1	13.0	30.3	50.7	8.1	48.8	44.8	8.2
LOS	E	C	A	C	D	B	C	D	A	D	D	A
Approach Delay	28.8			37.5			40.4			41.1		
Approach LOS	C			D			D			D		

**Intersection Summary**  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 36.4 Intersection LOS: D  
 Intersection Capacity Utilization 93.6% ICU Level of Service F  
 Analysis Period (min) 15



HCM Signalized Intersection Capacity Analysis FT 2032 PM Peak Hour  
 1: Bronte St S & Louis St. Laurent Ave 06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	252	827	328	128	811	262	347	637	95	366	533	145
Future Volume (vph)	252	827	328	128	811	262	347	637	95	366	533	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	4.0	3.0	5.0	4.0	3.0	5.0	6.0	3.0	5.0	6.0
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
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
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	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
Fit 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)	1825	3650	1608	1824	3650	1604	1823	3650	1586	1806	3650	1594
Fit Permitted	0.11	1.00	1.00	0.20	1.00	1.00	0.25	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	206	3650	1608	375	3650	1604	482	3650	1586	280	3650	1594
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	262	861	342	133	845	273	361	664	99	381	555	151
RTOR Reduction (vph)	0	0	53	0	34	0	0	77	0	0	113	0
Lane Group Flow (vph)	263	861	289	133	845	239	361	664	22	381	555	38
Confl. Peds. (#/hr)	16		10	10		16	9		13	13		9
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6	7	3	8		7	4	
Permitted Phases	2	2	6	6	8	8	8	8	4	4	4	4
Actuated Green, G (s)	53.6	40.7	63.7	42.2	33.3	57.0	49.7	26.7	26.7	51.1	27.4	27.4
Effective Green, g (s)	54.6	41.7	63.7	44.2	34.3	57.0	51.7	27.7	26.7	53.1	28.4	27.4
Actuated g/C Ratio	0.46	0.35	0.53	0.37	0.29	0.48	0.43	0.23	0.22	0.44	0.24	0.23
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	4.0	3.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	4.0	3.0
Lane Grp Cap (vph)	327	1268	853	257	1043	761	475	842	352	438	863	363
v/s Ratio Prot	c0.12	0.24	0.06	0.04	0.23	0.06	0.15	0.18		c0.18	0.15	
v/s Ratio Perm	c0.25		0.11	0.15		0.09	0.18		0.01	c0.21		0.02
v/c Ratio	0.80	0.68	0.34	0.52	0.81	0.31	0.76	0.79	0.06	0.87	0.64	0.10
Uniform Delay, d1	30.5	33.4	16.1	26.8	39.8	19.4	25.3	43.4	36.8	31.5	41.2	36.6
Progression Factor	1.54	0.79	0.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	2.5	0.2	1.8	6.8	0.2	7.0	4.9	0.1	16.6	1.7	0.1
Delay (s)	58.7	28.9	2.5	28.6	46.6	19.7	32.3	48.3	36.9	48.1	42.9	36.7
Level of Service	E	C	A	C	D	B	C	D	D	D	D	D
Approach Delay (s)	28.1			38.8			42.2			43.9		
Approach LOS	C			D			D			D		

**Intersection Summary**  
 HCM 2000 Control Delay 37.5 HCM 2000 Level of Service D  
 HCM 2000 Volume to Capacity ratio 0.87  
 Actuated Cycle Length (s) 120.0 Sum of lost time (s) 17.0  
 Intersection Capacity Utilization 93.6% ICU Level of Service F  
 Analysis Period (min) 15

c Critical Lane Group

Timings  
4: North Access 1/Private Driveway & Louis St. Laurent Ave

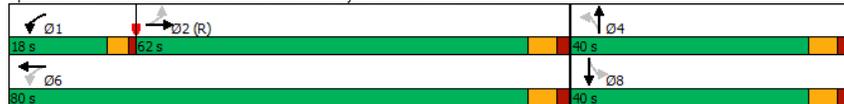
FT 2032 PM Peak Hour  
06/24/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	63	1204	138	1053	150	0	64	0
Future Volume (vph)	63	1204	138	1053	150	0	64	0
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		2	1	6		4		8
Permitted Phases		2	6		4		8	
Detector Phase		2	2	1	6	4	4	8
Switch Phase								
Minimum Initial (s)	20.0	20.0	5.0	20.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	9.0	26.0	30.0	30.0	30.0	30.0
Total Split (s)	62.0	62.0	18.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	51.7%	51.7%	15.0%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	76.5	76.5	91.2	90.2	18.8	18.8	18.8	18.8
Actuated g/C Ratio	0.64	0.64	0.76	0.75	0.16	0.16	0.16	0.16
v/c Ratio	0.22	0.61	0.45	0.44	0.71	0.28	0.36	0.19
Control Delay	14.3	15.7	19.2	4.3	65.9	1.5	49.0	1.9
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	14.3	15.7	19.2	4.5	65.9	1.5	49.0	1.9
LOS	B	B	B	A	E	A	D	A
Approach Delay		15.6		6.1		36.0		24.9
Approach LOS		B		A		D		C

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 13.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 84.2%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 4: North Access 1/Private Driveway & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
4: North Access 1/Private Driveway & Louis St. Laurent Ave

FT 2032 PM Peak Hour  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	63	1204	164	138	1053	109	150	0	130	64	0	67
Future Volume (vph)	63	1204	164	138	1053	109	150	0	130	64	0	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		4.0	5.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.85		1.00	0.85	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	3514		1789	3528		1789	1601		1789	1601	
Fit Permitted	0.24	1.00		0.13	1.00		0.71	1.00		0.61	1.00	
Satd. Flow (perm)	459	3514		242	3528		1344	1601		1142	1601	
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	1204	164	138	1053	109	150	0	130	64	0	67
RTOR Reduction (vph)	0	6	0	0	4	0	0	110	0	0	57	0
Lane Group Flow (vph)	63	1362	0	138	1158	0	150	20	0	64	10	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6		4			4		8
Permitted Phases		2		6			4			8		
Actuated Green, G (s)	75.5	75.5		89.2	89.2		18.8	18.8		18.8	18.8	
Effective Green, g (s)	76.5	76.5		89.2	90.2		18.8	18.8		18.8	18.8	
Actuated g/C Ratio	0.64	0.64		0.74	0.75		0.16	0.16		0.16	0.16	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	292	2240		304	2651		210	250		178	250	
v/s Ratio Prot		c0.39		0.04	c0.33		0.01				0.01	
v/s Ratio Perm	0.14			0.30			c0.11			0.06		
v/c Ratio	0.22	0.61		0.45	0.44		0.71	0.08		0.36	0.04	
Uniform Delay, d1	9.1	12.9		9.5	5.5		48.0	43.2		45.2	43.0	
Progression Factor	1.00	1.00		3.53	0.65		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.2		0.8	0.1		10.9	0.1		1.2	0.1	
Delay (s)	10.8	14.1		34.2	3.7		59.0	43.4		46.5	43.0	
Level of Service	B	B		C	A		E	D		D	D	
Approach Delay (s)		14.0			6.9			51.7			44.7	
Approach LOS		B			A			D			D	

Intersection Summary

HCM 2000 Control Delay 15.7  
 HCM 2000 Level of Service B  
 HCM 2000 Volume to Capacity ratio 0.62  
 Actuated Cycle Length (s) 120.0  
 Sum of lost time (s) 15.0  
 Intersection Capacity Utilization 84.2%  
 ICU Level of Service E  
 Analysis Period (min) 15

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 5: Bronte St S & East Access

FT 2032 PM Peak Hour  
 06/24/2025



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕↗	↕↘	
Traffic Volume (veh/h)	0	58	0	1083	901	88
Future Volume (Veh/h)	0	58	0	1083	901	88
Sign Control	Stop			Free		Free
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	64	0	1203	1001	98
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)	156					
pX, platoon unblocked	0.86	0.86	0.86			
vC, conflicting volume	1652	550	1099			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1439	164	800			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	91	100			
cM capacity (veh/h)	107	736	708			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	64	602	602	667	432	
Volume Left	0	0	0	0	0	
Volume Right	64	0	0	0	98	
cSH	736	1700	1700	1700	1700	
Volume to Capacity	0.09	0.35	0.35	0.39	0.25	
Queue Length 95th (m)	2.2	0.0	0.0	0.0	0.0	
Control Delay (s)	10.4	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	10.4	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay	0.3					
Intersection Capacity Utilization	38.0%		ICU Level of Service		A	
Analysis Period (min)	15					

Timings

FT 2032 SAT Peak Hour

1: Bronte St S & Louis St. Laurent Ave

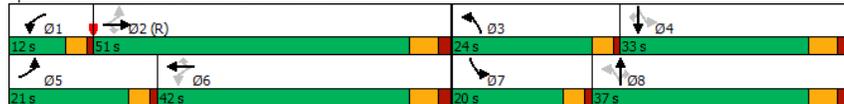
06/24/2025

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖	↖
Traffic Volume (vph)	242	702	250	95	645	197	229	418	77	285	464	155	
Future Volume (vph)	242	702	250	95	645	197	229	418	77	285	464	155	
Turn Type	pm+pt	NA	Perm										
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4		4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4	
Switch Phase													
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	15.0	15.0	5.0	15.0	15.0	
Minimum Split (s)	11.0	36.0	36.0	11.0	36.0	36.0	11.0	33.0	33.0	11.0	33.0	33.0	
Total Split (s)	21.0	51.0	51.0	12.0	42.0	42.0	24.0	37.0	37.0	20.0	33.0	33.0	
Total Split (%)	17.5%	42.5%	42.5%	10.0%	35.0%	35.0%	20.0%	30.8%	30.8%	16.7%	27.5%	27.5%	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	
Total Lost Time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	
Lead/Lag	Lead	Lag	Lag										
Lead-Lag Optimize?	Yes												
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None	None	
Act Effct Green (s)	68.7	54.8	53.8	60.1	49.2	48.2	42.9	23.5	22.5	41.4	22.7	21.7	
Actuated g/C Ratio	0.57	0.46	0.45	0.50	0.41	0.40	0.36	0.20	0.19	0.34	0.19	0.18	
v/c Ratio	0.54	0.44	0.32	0.25	0.45	0.28	0.66	0.61	0.19	0.79	0.70	0.38	
Control Delay	11.9	13.5	2.8	15.3	28.7	11.5	34.9	47.0	1.6	43.5	51.0	8.6	
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	11.9	13.5	2.8	15.3	28.7	11.5	34.9	47.0	1.6	43.5	51.0	8.6	
LOS	B	B	A	B	C	B	C	D	A	D	D	A	
Approach Delay	10.9			23.7			38.4			41.4			
Approach LOS	B			C			D			D			

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 26.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 82.9%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 1: Bronte St S & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis

FT 2032 SAT Peak Hour

1: Bronte St S & Louis St. Laurent Ave

06/24/2025

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖	↖
Traffic Volume (vph)	242	702	250	95	645	197	229	418	77	285	464	155	
Future Volume (vph)	242	702	250	95	645	197	229	418	77	285	464	155	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	3.0	5.0	6.0	
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	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	1.00	1.00	0.98	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	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	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1825	3650	1611	1825	3650	1594	1825	3650	1605	1806	3650	1633	
Fit Permitted	0.28	1.00	1.00	0.32	1.00	1.00	0.24	1.00	1.00	0.32	1.00	1.00	
Satd. Flow (perm)	537	3650	1611	615	3650	1594	454	3650	1605	608	3650	1633	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	252	731	260	99	672	205	239	435	80	297	483	161	
RTOR Reduction (vph)	0	0	86	0	0	81	0	0	65	0	0	132	
Lane Group Flow (vph)	252	731	174	99	672	124	239	435	15	297	483	29	
Conf. Peds. (#/hr)	2		1	1		2		4	4		4	4	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	
Turn Type	pm+pt	NA	Perm										
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4		4	
Actuated Green, G (s)	65.7	53.8	53.8	56.0	48.1	48.1	39.2	22.6	22.6	37.4	21.7	21.7	
Effective Green, g (s)	66.7	54.8	53.8	58.0	49.1	48.1	41.2	23.6	22.6	39.4	22.7	21.7	
Actuated g/C Ratio	0.56	0.46	0.45	0.48	0.41	0.40	0.34	0.20	0.19	0.33	0.19	0.18	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	455	1666	722	386	1493	638	356	717	302	366	690	295	
v/s Ratio Prot	c0.07	0.20		0.02	0.18		c0.10	0.12		c0.11	0.13		
v/s Ratio Perm	c0.24		0.11	0.10		0.08	0.13		0.01	c0.15		0.02	
v/c Ratio	0.55	0.44	0.24	0.26	0.45	0.19	0.67	0.61	0.05	0.81	0.70	0.10	
Uniform Delay, d1	15.2	22.2	20.5	17.2	25.7	23.4	30.6	44.0	39.9	32.8	45.5	41.0	
Progression Factor	0.56	0.54	0.19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.7	0.7	0.4	1.0	0.7	4.9	1.5	0.1	12.8	3.1	0.1	
Delay (s)	9.8	12.7	4.6	17.5	26.7	24.0	35.5	45.4	40.0	45.6	48.6	41.1	
Level of Service	A	B	A	B	C	C	D	D	D	D	D	D	
Approach Delay (s)	10.4			25.2			41.7			46.4			
Approach LOS	B			C			D			D			

Intersection Summary

HCM 2000 Control Delay 28.8  
 HCM 2000 Volume to Capacity ratio 0.66  
 Actuated Cycle Length (s) 120.0  
 Intersection Capacity Utilization 82.9%  
 ICU Level of Service E  
 Analysis Period (min) 15

c Critical Lane Group

Timings  
4: North Access 1/Private Driveway & Louis St. Laurent Ave

FT 2032 SAT Peak Hour  
06/24/2025

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	77	976	123	776	151	0	94	0
Future Volume (vph)	77	976	123	776	151	0	94	0
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	3	8		
Detector Phase	5	2	1	6	7	4	3	8
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.0	26.0	9.0	26.0	9.0	30.0	9.0	30.0
Total Split (s)	10.0	45.0	22.0	57.0	23.0	37.0	16.0	30.0
Total Split (%)	8.3%	37.5%	18.3%	47.5%	19.2%	30.8%	13.3%	25.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	4.0	5.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes							
Recall Mode	None	C-Max	None	None	None	None	None	None
Act Effct Green (s)	78.3	68.1	80.9	72.0	29.4	13.5	19.8	10.0
Actuated g/C Ratio	0.65	0.57	0.67	0.60	0.24	0.11	0.16	0.08
v/c Ratio	0.18	0.57	0.39	0.43	0.44	0.23	0.37	0.19
Control Delay	7.9	18.8	17.4	12.3	40.4	1.1	40.1	1.0
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	7.9	18.8	17.4	12.4	40.4	1.1	40.1	1.0
LOS	A	B	B	B	D	A	D	A
Approach Delay	18.1		13.0		23.1		22.9	
Approach LOS	B		B		C		C	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.57  
 Intersection Signal Delay: 17.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 66.5%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 4: North Access 1/Private Driveway & Louis St. Laurent Ave



HCM Signalized Intersection Capacity Analysis  
4: North Access 1/Private Driveway & Louis St. Laurent Ave

FT 2032 SAT Peak Hour  
06/24/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	77	976	162	123	776	127	151	0	119	94	0	74
Future Volume (vph)	77	976	162	123	776	127	151	0	119	94	0	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	4.0	5.0	4.0	6.0	4.0	6.0	4.0	6.0		
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	0.98	1.00	0.98	1.00	0.85	1.00	0.85	1.00	0.85		
Fit Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00		
Satd. Flow (prot)	1789	3502	1789	3503	1789	1601	1789	1601	1789	1601		
Fit Permitted	0.27	1.00	0.16	1.00	0.47	1.00	0.68	1.00	0.68	1.00		
Satd. Flow (perm)	507	3502	303	3503	890	1601	1282	1601				
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)	77	976	162	123	776	127	151	0	119	94	0	74
RTOR Reduction (vph)	0	8	0	0	8	0	104	0	0	69	0	0
Lane Group Flow (vph)	77	1130	0	123	895	0	151	15	0	94	5	0
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)	72.0	65.9		78.2	69.0		28.9	14.7		18.2	8.0	
Effective Green, g (s)	74.0	66.9		78.2	70.0		28.9	14.7		18.2	8.0	
Actuated g/C Ratio	0.62	0.56		0.65	0.58		0.24	0.12		0.15	0.07	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	388	1952		311	2043		340	196		237	106	
v/s Ratio Prot	0.01	c0.32		c0.03	0.26		c0.06	0.01		0.03	0.00	
v/s Ratio Perm	0.11			0.23			c0.04			0.03		
v/c Ratio	0.20	0.58		0.40	0.44		0.44	0.07		0.40	0.05	
Uniform Delay, d1	9.7	17.4		11.2	14.0		37.8	46.6		45.6	52.4	
Progression Factor	1.00	1.00		1.98	0.84		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.3		0.8	0.1		0.9	0.2		1.1	0.2	
Delay (s)	9.9	18.6		23.0	11.9		38.8	46.8		46.7	52.6	
Level of Service	A	B		C	B		D	D		D	D	
Approach Delay (s)	18.1			13.2			42.3			49.3		
Approach LOS	B			B			D			D		

Intersection Summary

HCM 2000 Control Delay 20.6  
 HCM 2000 Level of Service C  
 HCM 2000 Volume to Capacity ratio 0.54  
 Actuated Cycle Length (s) 120.0  
 Sum of lost time (s) 19.0  
 Intersection Capacity Utilization 66.5%  
 ICU Level of Service C  
 Analysis Period (min) 15

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 5: Bronte St S & East Access

FT 2032 SAT Peak Hour  
 06/24/2025



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑↑	↑↑	
Traffic Volume (veh/h)	0	51	0	725	739	75
Future Volume (Veh/h)	0	51	0	725	739	75
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	57	0	806	821	83
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)	156					
pX, platoon unblocked	0.88	0.88	0.88			
vC, conflicting volume	1266	452	904			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1024	98	612			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	100			
cM capacity (veh/h)	203	825	845			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	57	403	403	547	357	
Volume Left	0	0	0	0	0	
Volume Right	57	0	0	0	83	
cSH	825	1700	1700	1700	1700	
Volume to Capacity	0.07	0.24	0.24	0.32	0.21	
Queue Length 95th (m)	1.8	0.0	0.0	0.0	0.0	
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	
Lane LOS	A					
Approach Delay (s)	9.7	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.3					
Intersection Capacity Utilization	32.8%		ICU Level of Service		A	
Analysis Period (min)	15					

# **Appendix L:**

## **SIDRA Roundabout Analysis Reports**

# SITE LAYOUT

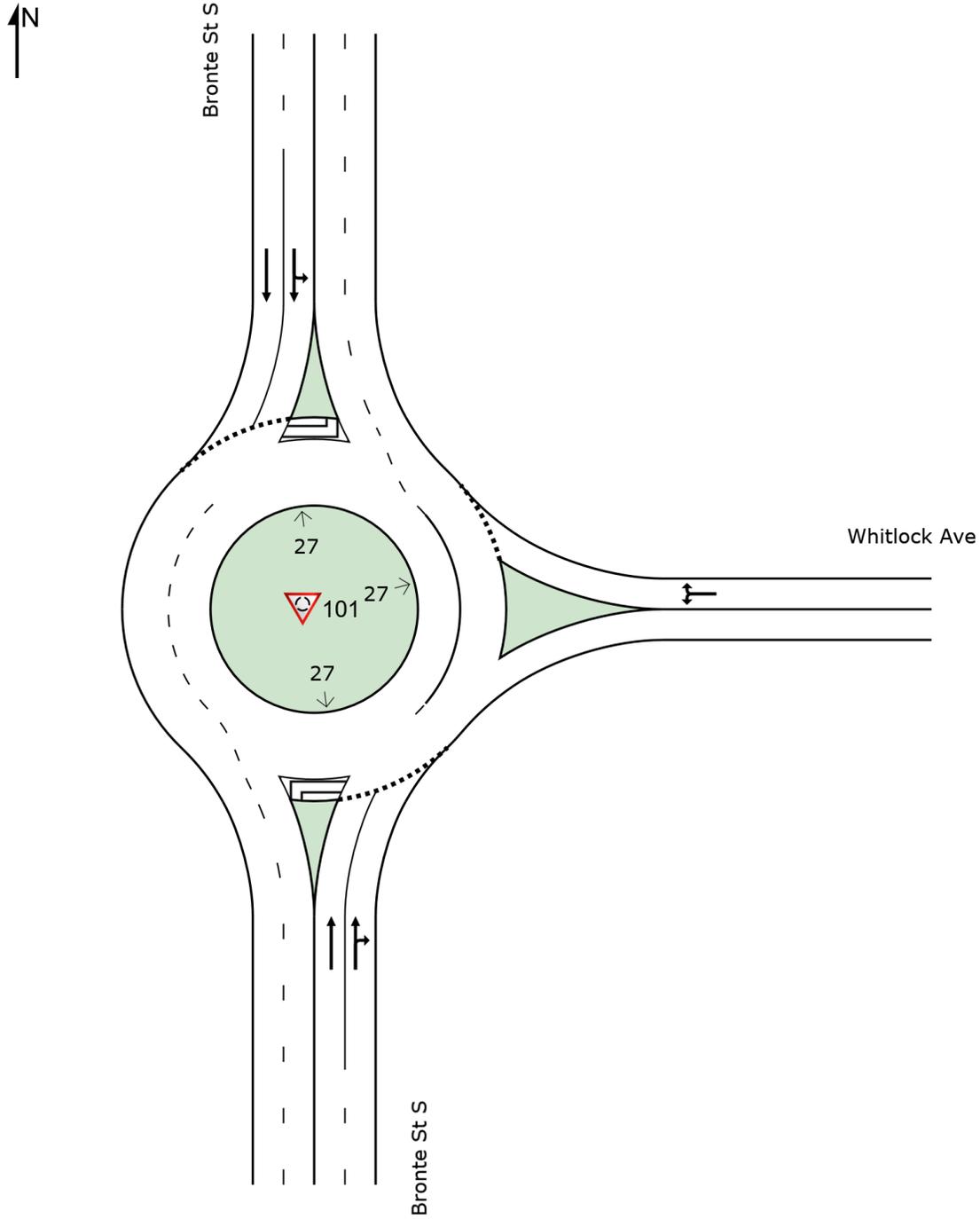
 **Site: 101 [Existing AM (Site Folder: General)]**

Bronte St S at Whitlock Ave\_Roundabout Analysis\_Existing AM

Site Category: Base Year

Roundabout

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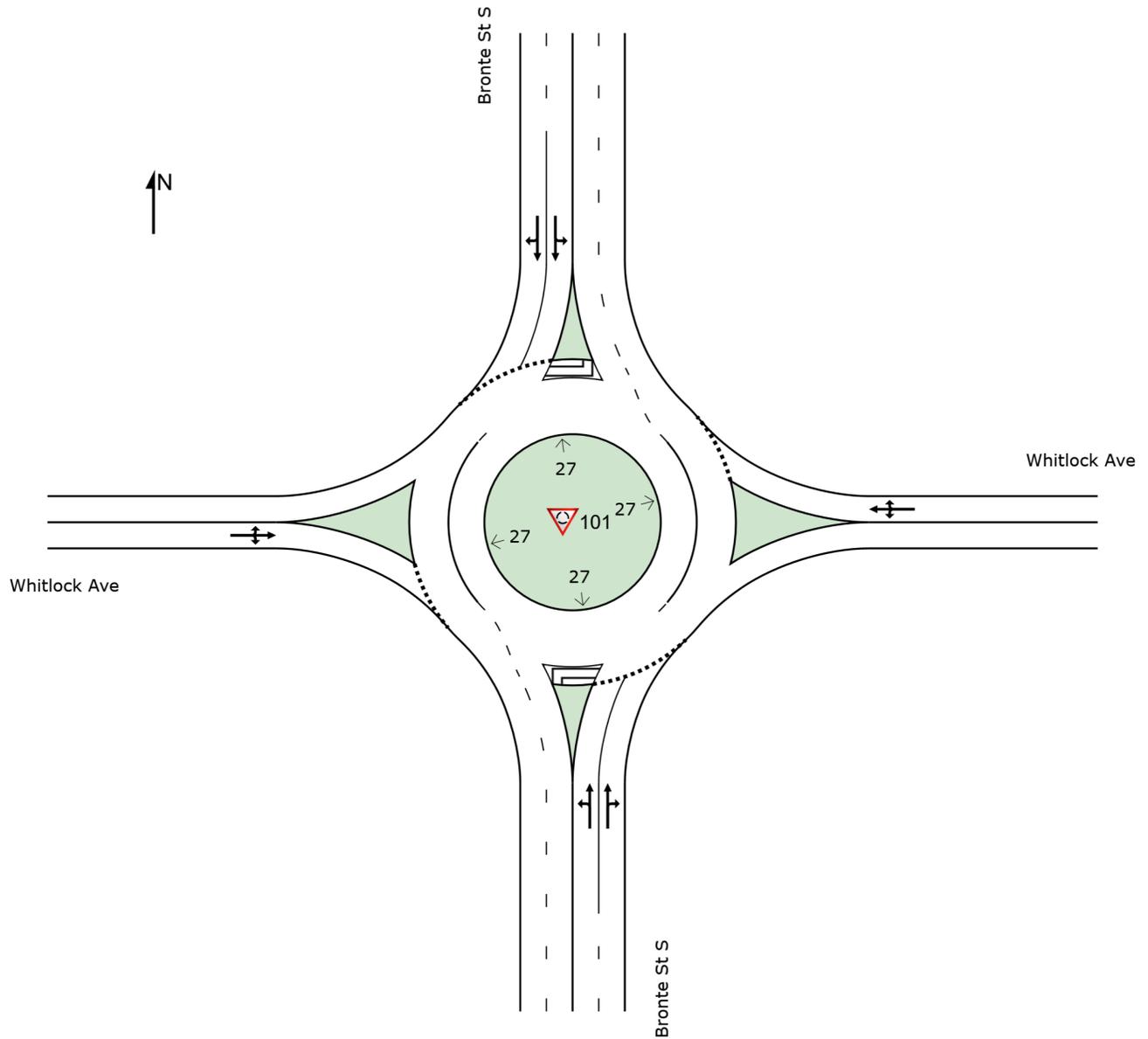
Project: \\TYLI.COM\Files\O\TYLin-TOR\Company\Projects\2022\10709 - Fieldgate - SMUN Block 1 TIS\03 Analysis\07 SIDRA\Fieldgate SMUN Lands - Roundabout Analysis\_All Scenarios\_20250702.sip9

# SITE LAYOUT

 Site: 101 [FB 2032 AM (Site Folder: General)]

Bronte St S at Whitlock Ave\_Roundabout Analysis\_FB 2032 AM  
Site Category: Base Year  
Roundabout

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# MOVEMENT SUMMARY

**Site: 101 [Existing AM (Site Folder: General)]**

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

Bronte St S at Whitlock Ave\_Roundabout Analysis\_Existing AM  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Bronte St S															
2	T1	All MCs	691	1.0	691	1.0	0.310	4.5	LOS A	2.0	15.5	0.39	0.42	0.39	53.9
18	R2	All MCs	91	0.0	91	0.0	0.310	4.5	LOS A	2.0	15.5	0.38	0.43	0.38	53.5
Approach			782	0.9	782	0.9	0.310	4.5	LOS A	2.0	15.5	0.39	0.42	0.39	53.9
East: Whitlock Ave															
3	L2	All MCs	119	2.0	119	2.0	0.474	9.7	LOS A	2.5	19.8	0.67	0.77	0.79	36.9
16	R2	All MCs	210	5.0	210	5.0	0.474	5.8	LOS A	2.5	19.8	0.67	0.77	0.79	37.0
Approach			329	3.9	329	3.9	0.474	7.2	LOS A	2.5	19.8	0.67	0.77	0.79	37.0
North: Bronte St S															
1	L2	All MCs	130	11.0	130	11.0	0.356	10.0	LOS A	2.6	20.3	0.41	0.49	0.41	51.9
6	T1	All MCs	753	2.0	753	2.0	0.356	4.1	LOS A	2.6	20.3	0.40	0.44	0.40	53.8
Approach			884	3.3	884	3.3	0.356	5.0	LOS A	2.6	20.3	0.40	0.44	0.40	53.5
All Vehicles			1995	2.5	1995	2.5	0.474	5.2	LOS A	2.6	20.3	0.44	0.49	0.46	50.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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# MOVEMENT SUMMARY

**Site: 101 [Existing PM (Site Folder: General)]**

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

Bronte St S at Whitlock Ave\_Roundabout Analysis\_Existing PM  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
			veh/h		veh/h		v/c	sec		veh	m				
South: Bronte St S															
2	T1	All MCs	463	0.0	463	0.0	0.184	4.2	LOS A	1.0	7.6	0.29	0.39	0.29	54.4
18	R2	All MCs	22	0.0	22	0.0	0.184	4.3	LOS A	1.0	7.6	0.29	0.40	0.29	53.9
Approach			485	0.0	485	0.0	0.184	4.2	LOS A	1.0	7.6	0.29	0.39	0.29	54.4
East: Whitlock Ave															
3	L2	All MCs	23	0.0	23	0.0	0.177	7.2	LOS A	0.7	5.4	0.48	0.50	0.48	38.1
16	R2	All MCs	129	0.0	129	0.0	0.177	3.0	LOS A	0.7	5.4	0.48	0.50	0.48	38.3
Approach			152	0.0	152	0.0	0.177	3.6	LOS A	0.7	5.4	0.48	0.50	0.48	38.3
North: Bronte St S															
1	L2	All MCs	120	0.0	120	0.0	0.158	9.0	LOS A	0.9	7.1	0.13	0.53	0.13	52.3
6	T1	All MCs	325	2.0	325	2.0	0.158	3.5	LOS A	0.9	7.2	0.12	0.40	0.12	54.8
Approach			445	1.5	445	1.5	0.158	5.0	LOS A	0.9	7.2	0.13	0.43	0.13	54.1
All Vehicles			1082	0.6	1082	0.6	0.184	4.4	LOS A	1.0	7.6	0.25	0.43	0.25	51.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: \\TYLI.COM\Files\O\TYLin-TOR\Company\Projects\2022\10709 - Fieldgate - SMUN Block 1 TIS\03 Analysis\07 SIDRA\Fieldgate SMUN Lands - Roundabout Analysis\_All Scenarios\_20250707\_v02.sip9

# MOVEMENT SUMMARY

**Site: 101 [Existing SAT (Site Folder: General)]**

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

Bronte St S at Whitlock Ave\_Roundabout Analysis\_Existing SAT  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. veh	Dist ]				
South: Bronte St S															
2	T1	All MCs	281	0.0	281	0.0	0.109	4.0	LOS A	0.5	4.2	0.21	0.37	0.21	54.8
18	R2	All MCs	17	0.0	17	0.0	0.109	4.1	LOS A	0.5	4.2	0.21	0.38	0.21	54.3
Approach			298	0.0	298	0.0	0.109	4.0	LOS A	0.5	4.2	0.21	0.37	0.21	54.8
East: Whitlock Ave															
3	L2	All MCs	20	0.0	20	0.0	0.095	6.5	LOS A	0.4	2.8	0.36	0.42	0.36	38.2
16	R2	All MCs	71	0.0	71	0.0	0.095	2.3	LOS A	0.4	2.8	0.36	0.42	0.36	38.4
Approach			91	0.0	91	0.0	0.095	3.2	LOS A	0.4	2.8	0.36	0.42	0.36	38.4
North: Bronte St S															
1	L2	All MCs	77	0.0	77	0.0	0.137	9.0	LOS A	0.8	5.8	0.11	0.49	0.11	52.9
6	T1	All MCs	316	0.0	316	0.0	0.137	3.4	LOS A	0.8	5.8	0.11	0.40	0.11	55.0
Approach			394	0.0	394	0.0	0.137	4.5	LOS A	0.8	5.8	0.11	0.42	0.11	54.6
All Vehicles			783	0.0	783	0.0	0.137	4.2	LOS A	0.8	5.8	0.18	0.40	0.18	52.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Organisation: TYLIN (SAM SCHWARTZ) | Licence: NETWORK / FLOATING | Processed: Monday, July 7, 2025 2:26:16 PM

Project: \\TYLI.COM\Files\O\TYLin-TOR\Company\Projects\2022\10709 - Fieldgate - SMUN Block 1 TIS\03 Analysis\07 SIDRA\Fieldgate SMUN Lands - Roundabout Analysis\_All Scenarios\_20250707\_v02.sip9

# MOVEMENT SUMMARY

Site: 101 [FB 2032 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bronte St S at Whitlock Ave\_Roundabout Analysis\_FB 2032 AM  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. veh	Dist ]				
			veh/h	%	veh/h	%	v/c	sec		m					km/h
South: Bronte St S															
5	L2	All MCs	35	2.0	35	2.0	0.569	11.7	LOS B	4.8	37.2	0.70	0.59	0.72	51.4
2	T1	All MCs	1139	1.0	1139	1.0	0.569	5.8	LOS A	4.9	37.3	0.69	0.57	0.70	52.6
18	R2	All MCs	139	0.0	139	0.0	0.569	5.6	LOS A	4.9	37.3	0.68	0.56	0.68	52.3
Approach			1314	0.9	1314	0.9	0.569	5.9	LOS A	4.9	37.3	0.69	0.57	0.70	52.5
East: Whitlock Ave															
3	L2	All MCs	180	2.0	180	2.0	0.675	13.2	LOS B	6.4	50.0	0.95	1.04	1.31	36.0
8	T1	All MCs	37	2.0	37	2.0	0.675	8.2	LOS A	6.4	50.0	0.95	1.04	1.31	36.3
16	R2	All MCs	367	5.0	367	5.0	0.675	8.0	LOS A	6.4	50.0	0.95	1.04	1.31	36.2
Approach			584	3.9	584	3.9	0.675	9.6	LOS A	6.4	50.0	0.95	1.04	1.31	36.2
North: Bronte St S															
1	L2	All MCs	191	11.0	191	11.0	0.616	12.1	LOS B	6.0	47.2	0.74	0.61	0.77	50.5
6	T1	All MCs	1130	2.0	1130	2.0	0.616	5.7	LOS A	6.0	47.2	0.73	0.57	0.74	52.2
14	R2	All MCs	78	2.0	78	2.0	0.616	5.5	LOS A	6.0	46.0	0.72	0.54	0.72	52.1
Approach			1400	3.2	1400	3.2	0.616	6.5	LOS A	6.0	47.2	0.73	0.58	0.74	51.9
West: Whitlock Ave															
7	L2	All MCs	58	2.0	58	2.0	0.166	10.4	LOS B	1.1	8.2	0.90	0.80	0.90	36.5
4	T1	All MCs	33	2.0	33	2.0	0.166	5.5	LOS A	1.1	8.2	0.90	0.80	0.90	36.7
12	R2	All MCs	13	2.0	13	2.0	0.166	6.2	LOS A	1.1	8.2	0.90	0.80	0.90	36.6
Approach			104	2.0	104	2.0	0.166	8.4	LOS A	1.1	8.2	0.90	0.80	0.90	36.6
All Vehicles			3401	2.4	3401	2.4	0.675	6.9	LOS A	6.4	50.0	0.76	0.66	0.83	47.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 101 [FB 2032 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bronte St S at Whitlock Ave\_Roundabout Analysis\_FB 2032 PM  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. veh	Dist ]				
South: Bronte St S															
5	L2	All MCs	49	2.0	49	2.0	0.429	12.3	LOS B	2.9	22.3	0.69	0.62	0.69	51.3
2	T1	All MCs	748	0.0	748	0.0	0.429	6.3	LOS A	3.1	23.5	0.68	0.61	0.68	52.5
18	R2	All MCs	110	0.0	110	0.0	0.429	6.1	LOS A	3.1	23.5	0.67	0.59	0.67	52.4
Approach			908	0.1	908	0.1	0.429	6.6	LOS A	3.1	23.5	0.68	0.60	0.68	52.5
East: Whitlock Ave															
3	L2	All MCs	90	0.0	90	0.0	0.302	7.8	LOS A	2.0	15.3	0.75	0.58	0.75	37.6
8	T1	All MCs	46	2.0	46	2.0	0.302	3.0	LOS A	2.0	15.3	0.75	0.58	0.75	37.8
16	R2	All MCs	232	0.0	232	0.0	0.302	3.0	LOS A	2.0	15.3	0.75	0.58	0.75	37.7
Approach			369	0.3	369	0.3	0.302	4.2	LOS A	2.0	15.3	0.75	0.58	0.75	37.7
North: Bronte St S															
1	L2	All MCs	268	0.0	268	0.0	0.396	10.3	LOS B	2.9	21.8	0.49	0.56	0.49	51.1
6	T1	All MCs	642	0.0	642	0.0	0.396	4.6	LOS A	2.9	22.4	0.48	0.49	0.48	53.1
14	R2	All MCs	103	2.0	103	2.0	0.396	4.7	LOS A	2.9	22.4	0.47	0.45	0.47	53.2
Approach			1013	0.2	1013	0.2	0.396	6.1	LOS A	2.9	22.4	0.48	0.50	0.48	52.6
West: Whitlock Ave															
7	L2	All MCs	137	2.0	137	2.0	0.192	7.9	LOS A	1.2	9.3	0.74	0.65	0.74	37.0
4	T1	All MCs	48	2.0	48	2.0	0.192	3.0	LOS A	1.2	9.3	0.74	0.65	0.74	37.3
12	R2	All MCs	28	2.0	28	2.0	0.192	3.8	LOS A	1.2	9.3	0.74	0.65	0.74	37.2
Approach			213	2.0	213	2.0	0.192	6.3	LOS A	1.2	9.3	0.74	0.65	0.74	37.1
All Vehicles			2502	0.3	2502	0.3	0.429	6.0	LOS A	3.1	23.5	0.62	0.56	0.62	48.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 101 [FB 2032 SAT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bronte St S at Whitlock Ave\_Roundabout Analysis\_FB 2032 SAT  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. veh	Dist ]				
South: Bronte St S															
5	L2	All MCs	30	2.0	30	2.0	0.237	10.7	LOS B	1.4	10.5	0.49	0.51	0.49	52.2
2	T1	All MCs	476	0.0	476	0.0	0.237	4.9	LOS A	1.4	10.9	0.48	0.50	0.48	53.5
18	R2	All MCs	65	0.0	65	0.0	0.237	4.9	LOS A	1.4	10.9	0.47	0.48	0.47	53.3
Approach			571	0.1	571	0.1	0.237	5.2	LOS A	1.4	10.9	0.48	0.49	0.48	53.4
East: Whitlock Ave															
3	L2	All MCs	65	0.0	65	0.0	0.142	6.5	LOS A	0.8	6.1	0.53	0.43	0.53	37.9
8	T1	All MCs	30	2.0	30	2.0	0.142	1.7	LOS A	0.8	6.1	0.53	0.43	0.53	38.1
16	R2	All MCs	139	0.0	139	0.0	0.142	2.0	LOS A	0.8	6.1	0.53	0.43	0.53	38.1
Approach			233	0.3	233	0.3	0.142	3.2	LOS A	0.8	6.1	0.53	0.43	0.53	38.0
North: Bronte St S															
1	L2	All MCs	173	0.0	173	0.0	0.299	9.8	LOS A	1.9	14.7	0.36	0.51	0.36	51.9
6	T1	All MCs	572	0.0	572	0.0	0.299	4.1	LOS A	2.0	15.0	0.35	0.44	0.35	53.7
14	R2	All MCs	67	2.0	67	2.0	0.299	4.2	LOS A	2.0	15.0	0.34	0.40	0.34	53.8
Approach			812	0.2	812	0.2	0.299	5.4	LOS A	2.0	15.0	0.35	0.45	0.35	53.3
West: Whitlock Ave															
7	L2	All MCs	89	2.0	89	2.0	0.104	7.1	LOS A	0.6	4.6	0.63	0.57	0.63	37.2
4	T1	All MCs	31	2.0	31	2.0	0.104	2.2	LOS A	0.6	4.6	0.63	0.57	0.63	37.5
12	R2	All MCs	18	2.0	18	2.0	0.104	2.9	LOS A	0.6	4.6	0.63	0.57	0.63	37.4
Approach			139	2.0	139	2.0	0.104	5.5	LOS A	0.6	4.6	0.63	0.57	0.63	37.3
All Vehicles			1755	0.3	1755	0.3	0.299	5.0	LOS A	2.0	15.0	0.44	0.47	0.44	49.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 101 [FT 2032 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bronte St S at Whitlock Ave\_Roundabout Analysis\_FT 2032 AM  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. ]	Dist ]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Bronte St S															
5	L2	All MCs	148	2.0	148	2.0	0.672	14.5	LOS B	7.4	57.0	0.84	0.76	1.00	50.1
2	T1	All MCs	1149	1.0	1149	1.0	0.672	8.3	LOS A	7.6	58.3	0.83	0.73	0.97	51.6
18	R2	All MCs	139	0.0	139	0.0	0.672	7.8	LOS A	7.6	58.3	0.82	0.71	0.94	51.6
Approach			1437	1.0	1437	1.0	0.672	8.9	LOS A	7.6	58.3	0.83	0.74	0.97	51.4
East: Whitlock Ave															
3	L2	All MCs	180	2.0	180	2.0	0.906	27.6	LOS C	13.3	104.0	1.00	1.59	2.18	31.7
8	T1	All MCs	68	2.0	68	2.0	0.906	22.6	LOS C	13.3	104.0	1.00	1.59	2.18	31.9
16	R2	All MCs	367	5.0	367	5.0	0.906	22.2	LOS C	13.3	104.0	1.00	1.59	2.18	31.8
Approach			615	3.8	615	3.8	0.906	23.8	LOS C	13.3	104.0	1.00	1.59	2.18	31.8
North: Bronte St S															
1	L2	All MCs	195	11.0	195	11.0	0.710	16.3	LOS B	8.5	67.3	0.89	0.82	1.12	48.9
6	T1	All MCs	1157	2.0	1157	2.0	0.710	9.2	LOS A	8.9	68.8	0.88	0.78	1.07	51.0
14	R2	All MCs	78	2.0	78	2.0	0.710	8.8	LOS A	8.9	68.8	0.88	0.76	1.05	51.2
Approach			1430	3.2	1430	3.2	0.710	10.1	LOS B	8.9	68.8	0.88	0.79	1.08	50.7
West: Whitlock Ave															
7	L2	All MCs	122	2.0	122	2.0	0.576	15.1	LOS B	4.8	36.8	1.00	1.03	1.29	35.1
4	T1	All MCs	58	2.0	58	2.0	0.576	10.2	LOS B	4.8	36.8	1.00	1.03	1.29	35.3
12	R2	All MCs	141	2.0	141	2.0	0.576	10.9	LOS B	4.8	36.8	1.00	1.03	1.29	35.3
Approach			320	2.0	320	2.0	0.576	12.4	LOS B	4.8	36.8	1.00	1.03	1.29	35.2
All Vehicles			3803	2.4	3803	2.4	0.906	12.1	LOS B	13.3	104.0	0.89	0.92	1.23	45.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 101 [FT 2032 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bronte St S at Whitlock Ave\_Roundabout Analysis\_FT 2032 PM  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. veh	Dist ]				
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Bronte St S															
5	L2	All MCs	211	2.0	211	2.0	0.547	14.2	LOS B	4.7	36.1	0.80	0.75	0.90	49.7
2	T1	All MCs	762	0.0	762	0.0	0.547	7.7	LOS A	4.9	37.0	0.79	0.71	0.87	51.6
18	R2	All MCs	110	0.0	110	0.0	0.547	7.4	LOS A	4.9	37.0	0.79	0.68	0.85	51.8
Approach			1083	0.4	1083	0.4	0.547	9.0	LOS A	4.9	37.0	0.79	0.72	0.88	51.2
East: Whitlock Ave															
3	L2	All MCs	90	0.0	90	0.0	0.415	9.0	LOS A	3.0	23.2	0.87	0.73	0.91	37.3
8	T1	All MCs	84	2.0	84	2.0	0.415	4.3	LOS A	3.0	23.2	0.87	0.73	0.91	37.6
16	R2	All MCs	232	0.0	232	0.0	0.415	3.9	LOS A	3.0	23.2	0.87	0.73	0.91	37.5
Approach			406	0.4	406	0.4	0.415	5.1	LOS A	3.0	23.2	0.87	0.73	0.91	37.5
North: Bronte St S															
1	L2	All MCs	271	0.0	271	0.0	0.473	11.8	LOS B	3.4	26.2	0.69	0.66	0.69	50.3
6	T1	All MCs	658	0.0	658	0.0	0.473	5.9	LOS A	3.6	27.4	0.68	0.60	0.68	52.3
14	R2	All MCs	103	2.0	103	2.0	0.473	6.0	LOS A	3.6	27.4	0.67	0.58	0.67	52.3
Approach			1032	0.2	1032	0.2	0.473	7.4	LOS A	3.6	27.4	0.68	0.61	0.68	51.7
West: Whitlock Ave															
7	L2	All MCs	163	2.0	163	2.0	0.383	8.3	LOS A	2.7	20.7	0.84	0.69	0.84	37.2
4	T1	All MCs	76	2.0	76	2.0	0.383	3.4	LOS A	2.7	20.7	0.84	0.69	0.84	37.4
12	R2	All MCs	154	2.0	154	2.0	0.383	4.1	LOS A	2.7	20.7	0.84	0.69	0.84	37.4
Approach			394	2.0	394	2.0	0.383	5.7	LOS A	2.7	20.7	0.84	0.69	0.84	37.3
All Vehicles			2915	0.5	2915	0.5	0.547	7.4	LOS A	4.9	37.0	0.77	0.68	0.81	46.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 101 [FT 2032 SAT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bronte St S at Whitlock Ave\_Roundabout Analysis\_FT 2032 SAT  
 Site Category: Base Year  
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	%	[ Total HV ]	%				[ Veh. veh	Dist ]				
South: Bronte St S															
5	L2	All MCs	265	2.0	265	2.0	0.379	11.6	LOS B	2.5	19.5	0.64	0.66	0.64	50.1
2	T1	All MCs	498	0.0	498	0.0	0.379	5.6	LOS A	2.7	20.3	0.63	0.57	0.63	52.5
18	R2	All MCs	65	0.0	65	0.0	0.379	5.6	LOS A	2.7	20.3	0.62	0.55	0.62	52.6
Approach			827	0.6	827	0.6	0.379	7.5	LOS A	2.7	20.3	0.63	0.60	0.63	51.7
East: Whitlock Ave															
3	L2	All MCs	65	0.0	65	0.0	0.231	7.6	LOS A	1.5	11.2	0.72	0.53	0.72	37.6
8	T1	All MCs	84	2.0	84	2.0	0.231	2.7	LOS A	1.5	11.2	0.72	0.53	0.72	37.9
16	R2	All MCs	139	0.0	139	0.0	0.231	2.8	LOS A	1.5	11.2	0.72	0.53	0.72	37.8
Approach			287	0.6	287	0.6	0.231	3.8	LOS A	1.5	11.2	0.72	0.53	0.72	37.8
North: Bronte St S															
1	L2	All MCs	173	0.0	173	0.0	0.394	11.8	LOS B	2.7	20.3	0.66	0.64	0.66	50.7
6	T1	All MCs	603	0.0	603	0.0	0.394	5.9	LOS A	2.8	21.3	0.65	0.59	0.65	52.4
14	R2	All MCs	67	2.0	67	2.0	0.394	5.9	LOS A	2.8	21.3	0.65	0.57	0.65	52.4
Approach			843	0.2	843	0.2	0.394	7.1	LOS A	2.8	21.3	0.65	0.60	0.65	52.0
West: Whitlock Ave															
7	L2	All MCs	139	2.0	139	2.0	0.351	7.6	LOS A	2.4	18.7	0.77	0.60	0.77	37.4
4	T1	All MCs	74	2.0	74	2.0	0.351	2.6	LOS A	2.4	18.7	0.77	0.60	0.77	37.7
12	R2	All MCs	214	2.0	214	2.0	0.351	3.4	LOS A	2.4	18.7	0.77	0.60	0.77	37.6
Approach			427	2.0	427	2.0	0.351	4.6	LOS A	2.4	18.7	0.77	0.60	0.77	37.6
All Vehicles			2384	0.7	2384	0.7	0.394	6.4	LOS A	2.8	21.3	0.67	0.59	0.67	46.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# **Appendix M:**

## **SimTraffic Queueing Reports**

# **Appendix M1:**

## **SimTraffic Queueing Reports**

Queuing and Blocking Report  
 Baseline AM Peak Hour

07/03/2025

Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR									
Maximum Queue (m)	31.0	51.9	69.8	36.0	40.2	40.8	79.0	47.4	52.1	60.0	56.6	49.2
Average Queue (m)	13.9	27.2	37.8	15.3	20.5	18.5	39.6	22.5	28.8	30.2	30.9	22.6
95th Queue (m)	25.8	45.8	60.1	29.4	35.8	34.4	67.9	39.5	46.5	52.9	50.0	41.3
Link Distance (m)		646.0	646.0		234.0	234.0		448.6	448.6		228.9	228.9
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	40.0			45.0			35.0			35.0		
Storage Blk Time (%)	0	1		0	0		19	1		10	5	
Queuing Penalty (veh)	0	1		0	0		38	3		19	8	

Zone Summary

Zone wide Queuing Penalty: 70

Queuing and Blocking Report  
 Baseline PM Peak Hour

07/03/2025

Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR									
Maximum Queue (m)	43.9	31.4	37.4	26.4	47.4	41.4	50.5	40.7	44.7	51.3	49.5	40.8
Average Queue (m)	18.3	14.8	18.9	8.9	23.8	17.2	25.0	21.2	24.8	24.1	24.3	16.6
95th Queue (m)	35.2	26.7	32.6	20.5	41.3	33.0	43.2	35.1	40.5	42.7	42.4	33.3
Link Distance (m)		646.0	646.0		234.0	234.0		448.6	448.6		228.9	228.9
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	40.0			45.0			35.0			35.0		
Storage Blk Time (%)	1	0			0		4	1		4	2	
Queuing Penalty (veh)	1	0			0		7	1		6	4	

Zone Summary

Zone wide Queuing Penalty: 19

Queuing and Blocking Report  
 Baseline SAT Peak Hour

07/03/2025

Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR									
Maximum Queue (m)	36.2	24.4	34.3	18.9	37.4	33.3	28.7	33.2	34.7	47.0	47.9	38.6
Average Queue (m)	12.7	10.3	13.8	6.1	15.7	11.3	12.8	16.0	18.2	24.0	24.5	15.5
95th Queue (m)	25.6	20.6	27.5	14.9	30.1	24.9	25.5	27.9	30.7	40.5	42.1	31.7
Link Distance (m)		646.0	646.0		234.0	234.0		448.6	448.6		228.9	228.9
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	40.0			45.0			35.0			35.0		
Storage Blk Time (%)	0				0		0	0		3	2	
Queuing Penalty (veh)	0				0		0	0		4	3	

Zone Summary

Zone wide Queuing Penalty: 8

**Intersection: 1: Bronte St S & Louis St. Laurent Ave**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	95.2	113.0	115.5	101.5	61.5	104.9	96.3	69.2	101.7	92.0	87.8	32.2
Average Queue (m)	43.0	70.1	70.8	40.1	28.7	71.0	61.7	37.7	58.0	52.3	54.6	12.8
95th Queue (m)	79.6	99.4	99.9	78.1	52.9	96.1	86.5	63.9	92.3	77.7	78.8	25.9
Link Distance (m)		134.5	134.5			233.0	233.0			128.5	128.5	
Upstream Blk Time (%)		0	0						0	0		
Queuing Penalty (veh)		0	0						0	0		
Storage Bay Dist (m)	40.0			30.0	45.0			30.0	35.0			50.0
Storage Blk Time (%)	22	32	42	14	5	30	29	17	32	22	13	0
Queuing Penalty (veh)	98	68	154	63	17	39	90	58	106	82	20	0

**Intersection: 1: Bronte St S & Louis St. Laurent Ave**

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	98.4	164.0	142.5	49.2
Average Queue (m)	61.5	84.7	72.1	11.0
95th Queue (m)	105.6	144.1	125.7	35.0
Link Distance (m)		225.2	225.2	
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (m)	35.0			50.0
Storage Blk Time (%)	44	50	23	
Queuing Penalty (veh)	141	134	22	

**Intersection: 4: Louis St. Laurent Ave & Private Driveway**

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (m)	17.4	82.5	86.9	32.3	35.5	44.4	17.8
Average Queue (m)	5.3	27.7	27.7	6.4	10.8	19.4	8.1
95th Queue (m)	13.6	59.8	71.1	22.0	26.7	37.1	16.0
Link Distance (m)		490.1	490.1	134.5	134.5	128.6	128.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	75.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

**Zone Summary**

Zone wide Queuing Penalty: 1090

**Intersection: 1: Bronte St S & Louis St. Laurent Ave**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	106.7	124.0	122.8	94.8	84.3	143.0	137.1	87.6	91.3	89.8	97.6	33.0
Average Queue (m)	68.9	81.0	77.7	31.1	31.9	93.0	84.7	31.2	49.0	56.4	60.3	9.5
95th Queue (m)	120.6	131.2	123.5	68.9	73.7	133.4	126.9	68.5	78.9	82.3	87.7	21.9
Link Distance (m)		134.5	134.5			233.0	233.0			128.5	128.5	
Upstream Blk Time (%)		5	1				0					
Queuing Penalty (veh)		34	5				0					
Storage Bay Dist (m)	40.0			30.0	45.0			30.0	35.0			50.0
Storage Blk Time (%)	55	32	43	5	9	49	50	6	24	32	22	
Queuing Penalty (veh)	218	72	133	21	34	59	131	23	76	107	19	

**Intersection: 1: Bronte St S & Louis St. Laurent Ave**

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	96.6	112.8	100.4	27.4
Average Queue (m)	59.1	58.6	47.9	11.2
95th Queue (m)	93.6	101.2	86.4	21.9
Link Distance (m)		225.2	225.2	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	35.0			50.0
Storage Blk Time (%)	38	33	6	
Queuing Penalty (veh)	96	120	8	

**Intersection: 4: Louis St. Laurent Ave & Private Driveway**

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (m)	25.6	58.0	64.3	40.8	47.0	49.0	21.5
Average Queue (m)	9.9	28.9	27.0	8.0	10.9	18.7	9.6
95th Queue (m)	20.8	65.3	64.0	26.4	30.2	48.8	18.1
Link Distance (m)		490.1	490.1	134.5	134.5	128.6	128.6
Upstream Blk Time (%)						0	
Queuing Penalty (veh)						0	
Storage Bay Dist (m)	75.0						
Storage Blk Time (%)			1				
Queuing Penalty (veh)			1				

**Zone Summary**

Zone wide Queuing Penalty: 1157

**Intersection: 1: Bronte St S & Louis St. Laurent Ave**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	56.0	67.0	66.1	38.3	32.5	83.2	70.0	38.4	60.0	59.2	59.9	18.9
Average Queue (m)	25.6	42.4	44.0	17.5	13.5	54.4	44.8	17.9	29.3	32.6	33.9	6.4
95th Queue (m)	45.3	61.8	62.8	30.7	25.6	74.4	65.3	31.9	49.1	51.5	53.7	13.8
Link Distance (m)		134.5	134.5			233.0	233.0			128.5	128.5	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	40.0			30.0	45.0			30.0	35.0			50.0
Storage Blk Time (%)	3	6	18	1	0	13	15	1	7	6	2	
Queuing Penalty (veh)	11	13	40	3	0	11	29	4	13	13	1	

**Intersection: 1: Bronte St S & Louis St. Laurent Ave**

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	83.1	82.7	71.4	27.9
Average Queue (m)	42.4	43.0	33.5	10.0
95th Queue (m)	69.6	68.8	58.4	20.7
Link Distance (m)		225.2	225.2	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	35.0			50.0
Storage Blk Time (%)	19	19	1	
Queuing Penalty (veh)	42	54	2	

**Intersection: 4: Louis St. Laurent Ave & Private Driveway**

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (m)	27.5	48.6	48.0	25.1	31.0	48.4	23.2
Average Queue (m)	10.6	20.9	17.3	6.9	10.4	21.6	9.8
95th Queue (m)	21.4	39.9	37.1	19.5	24.0	40.1	17.8
Link Distance (m)		490.1	490.1	134.5	134.5	128.6	128.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	75.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

**Zone Summary**

Zone wide Queuing Penalty: 237

Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	114.1	128.4	131.5	100.9	88.4	125.2	113.3	76.8	104.7	100.0	94.1	37.1
Average Queue (m)	57.0	77.7	77.6	36.1	46.3	82.6	70.4	33.1	66.5	57.8	60.0	14.7
95th Queue (m)	100.7	115.4	116.6	83.9	96.0	118.3	103.9	60.5	101.0	86.7	86.5	28.9
Link Distance (m)		134.3	134.3			233.0	233.0			128.5	128.5	
Upstream Blk Time (%)		1	0									
Queuing Penalty (veh)		4	3									
Storage Bay Dist (m)	40.0			30.0	45.0			30.0	35.0			50.0
Storage Blk Time (%)	38	28	41	4	26	42	38	10	40	30	19	0
Queuing Penalty (veh)	172	64	150	18	90	58	119	35	138	114	30	0

Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	99.9	179.8	161.7	88.8
Average Queue (m)	65.4	99.6	88.4	20.0
95th Queue (m)	114.3	167.4	150.5	68.3
Link Distance (m)		225.2	225.2	
Upstream Blk Time (%)		1	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	35.0			50.0
Storage Blk Time (%)	40	60	38	
Queuing Penalty (veh)	131	162	42	

Intersection: 4: North Access 1/Private Driveway & Louis St. Laurent Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	15.6	98.0	106.6	23.1	63.9	69.0	45.3	20.0	40.7	30.9
Average Queue (m)	4.5	48.2	51.8	8.8	36.8	42.9	19.6	7.5	19.1	8.9
95th Queue (m)	12.0	84.9	91.7	18.7	57.3	62.4	36.9	16.9	34.7	21.8
Link Distance (m)		486.3	486.3		134.3	134.3	126.6	126.6		128.6
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	75.0			25.0					30.0	
Storage Blk Time (%)		1		0	12				4	0
Queuing Penalty (veh)		0		1	6				2	0

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Intersection: 5: Bronte St S & East Access

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Movement	EB	SB
Directions Served	R	T
Maximum Queue (m)	12.8	0.6
Average Queue (m)	5.0	0.0
95th Queue (m)	12.3	0.6
Link Distance (m)	114.8	128.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Zone Summary

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Zone wide Queuing Penalty: 1341

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Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	114.6	143.5	144.2	104.6	122.2	191.5	185.4	108.9	98.5	95.2	95.3	28.1
Average Queue (m)	89.0	103.8	96.2	36.2	51.9	132.6	122.2	53.1	52.1	56.1	58.4	8.9
95th Queue (m)	138.5	160.8	153.2	94.4	131.9	222.8	215.4	133.9	83.8	83.9	85.4	19.8
Link Distance (m)		134.3	134.3			233.0	233.0			128.5	128.5	
Upstream Blk Time (%)		13	2			6	5					0
Queuing Penalty (veh)		87	12			0	0					0
Storage Bay Dist (m)	40.0			30.0	45.0			30.0	35.0			50.0
Storage Blk Time (%)	75	38	51	2	9	63	60	4	25	29	19	
Queuing Penalty (veh)	312	95	167	8	37	81	158	17	81	100	18	

Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	94.8	120.6	107.2	43.9
Average Queue (m)	60.9	60.1	50.4	13.9
95th Queue (m)	94.3	101.4	85.0	30.9
Link Distance (m)		225.2	225.2	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	35.0			50.0
Storage Blk Time (%)	40	36	8	0
Queuing Penalty (veh)	107	133	12	0

Intersection: 4: North Access 1/Private Driveway & Louis St. Laurent Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	83.1	217.6	215.1	47.0	51.5	58.2	64.2	54.0	38.7	43.3
Average Queue (m)	26.4	102.9	104.6	21.9	28.5	33.9	31.7	22.6	15.8	12.3
95th Queue (m)	111.5	262.6	257.8	40.7	46.7	51.9	54.0	55.0	33.6	35.6
Link Distance (m)		486.3	486.3		134.3	134.3	126.6	126.6		128.6
Upstream Blk Time (%)		1	0					0		0
Queuing Penalty (veh)		0	0					0		0
Storage Bay Dist (m)	75.0			25.0					30.0	
Storage Blk Time (%)		20		9	8				6	0
Queuing Penalty (veh)		13		45	11				4	0

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Intersection: 5: Bronte St S & East Access

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Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (m)	18.3	1.0	0.6
Average Queue (m)	8.3	0.0	0.0
95th Queue (m)	14.7	0.9	0.6
Link Distance (m)	114.8	128.5	128.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Zone Summary

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Zone wide Queuing Penalty: 1497

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Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	62.0	73.6	74.3	37.7	34.2	87.0	75.8	33.8	65.4	61.2	62.0	20.8
Average Queue (m)	30.2	45.2	47.1	16.8	15.3	59.5	48.4	15.3	34.8	35.1	37.4	6.6
95th Queue (m)	53.7	68.9	68.2	30.7	28.4	81.7	71.6	27.5	56.0	54.1	57.7	14.9
Link Distance (m)		134.3	134.3			233.0	233.0			128.5	128.5	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	40.0			30.0	45.0			30.0	35.0			50.0
Storage Blk Time (%)	5	7	15	1	0	19	18	1	12	9	3	
Queuing Penalty (veh)	17	16	38	3	0	18	36	2	24	20	2	

Intersection: 1: Bronte St S & Louis St. Laurent Ave

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	95.1	110.4	78.5	29.4
Average Queue (m)	49.6	50.6	40.4	12.1
95th Queue (m)	83.2	82.5	67.4	23.1
Link Distance (m)		225.2	225.2	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	35.0			50.0
Storage Blk Time (%)	34	25	4	
Queuing Penalty (veh)	78	70	6	

Intersection: 4: North Access 1/Private Driveway & Louis St. Laurent Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	22.4	83.6	91.4	33.7	77.6	81.3	62.4	28.5	35.7	35.5
Average Queue (m)	8.1	40.2	42.9	16.2	31.6	36.3	33.3	14.3	19.5	11.7
95th Queue (m)	17.4	73.1	77.2	28.5	62.0	68.4	54.0	23.9	32.3	24.4
Link Distance (m)		486.3	486.3		134.3	134.3	126.6	126.6		128.6
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	75.0			25.0					30.0	
Storage Blk Time (%)		0		2	11				3	0
Queuing Penalty (veh)		0		8	14				2	0

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Intersection: 5: Bronte St S & East Access

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Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (m)	16.8	3.0	2.3
Average Queue (m)	7.8	0.1	0.1
95th Queue (m)	14.2	2.1	1.8
Link Distance (m)	114.8	128.5	128.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Zone Summary

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Zone wide Queuing Penalty: 356

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# **Appendix M2:**

## **Traffic Circle Queueing Reports**

Intersection: 20: District Park Entrance/Whitlock Ave & North Access 1

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	14.1	11.3
Average Queue (m)	2.5	2.8
95th Queue (m)	10.0	9.8
Link Distance (m)	41.7	127.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: District Park Entrance/Whitlock Ave & North Access 1

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	23.1	14.1
Average Queue (m)	4.8	4.3
95th Queue (m)	15.8	12.3
Link Distance (m)	57.8	127.7
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: District Park Entrance/Whitlock Ave & North Access 1

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	17.7	18.4
Average Queue (m)	4.4	5.8
95th Queue (m)	13.5	15.9
Link Distance (m)	41.7	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

# **Appendix N:**

## **TDM Checklist**



# Travel Demand Management (TDM) Implementation Checklist

Version 9/18/2013

# Appendix H

Case Study: Fieldgate SMUN Lands

Site Context: \_\_\_\_\_

TDM Checklist No: \_\_\_\_\_

ZBL Parking Requirement: \_\_\_\_\_

Date: April 13, 2022

Applicable Parking Reduction: \_\_\_\_\_

**The Transportation Demand Management (TDM) Checklist and Parking Management Worksheet are not designed for residential properties, but can be used to inform mixed-use developments.**

TABLE A		Site Access			
In creating an environment that supports pedestrian and cycling activity, the public realm must be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s). These facilities and features should encourage walking and cycling.					
Points		Features	Yes	N/A	
A1	2	Development incorporates functional building entrances that are oriented to public space or to locations where pedestrians and transit users arrive from such as a street, square, park or plaza.	X		
A2	1	External to site: Continuous sidewalks (consistent with AODA Accessible Built Environment Standard) are provided along both sides of all adjacent public streets (over and above requirement) AND Internal to site: Pedestrian walkways (consistent with AODA Accessible Built Environment Standard e.g.1.8m min width) are provided through large parking areas to link the building with the public street sidewalk system	X		
A3	3	Non-residential: development provides secure bike storage for 5% of the building occupants. Consistent with LEED requirements.	X		
A4	4	Shower and change facilities for employees provided on-site consistent with LEED requirements.			
A5	2	Provision of active uses at-grade along street frontages (e.g. retail).	X		
Category Max =		10	Total Points Applicable =	10	Score = 8

TABLE B		Public Transportation Access			
The availability and proximity of convenient public transit service with direct pedestrian linkages to the building will provide viable travel options for employees, visitors and residents.					
Points		Features	Yes	N/A	
B1	1	Bus shelters with seating are provided at the transit stop immediately adjacent to the development in consultation with Transportation Planning at the Region of Waterloo			
B2	1	Information regarding public transit routes, schedules and fares are provided in an accessible and visible location on site and in adjacent bus stops	X		
B3a	5	Located within 800m of a Rapid Transit Station			
B3b	3	Located within 600 m of a bus service with headways of 15 min or less or is located in a designated mixed use corridor or node. <b>Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.</b>	X		
B3c	1	Located within 400 m of a bus service with headways of 16 min to 30 min. <b>Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.</b>			
Category Max =		5	Total Points Applicable =	5	Score = 4

TABLE C		Parking			
Vehicle parking facilities can affect the character, travel mode and cost of a development. Reducing parking supply to match expected demand can have a positive influence on the selection of alternative travel modes.					
Points		Features	Yes	N/A	
C1	24	Utilizes reduced parking supply consistent with the TDM Parking Management Worksheet. Contact your Area Municipal planning authority to determine whether the Worksheet is applicable to your development. <b>Note: Points are awarded for either C1, C2, or C3 only. Please choose whichever applies with the highest value.</b>			
C2	24	Includes allowances for shared parking in mixed-use zones. <b>Note: Points are awarded for C1, C2, or C3 only. Please choose whichever applies after consulting with the Area Municipal planning authority.</b>	X		
C3	15	Provides no more than the minimum number of parking spaces, as required by applicable Zoning By-Law. <b>Note: Points are awarded for either C1, C2, or C3 only. Please choose whichever applies.</b>			
C4	10	Implements paid parking on part or all of the site (e.g. parking permits, paid parking zones near main entrances)			
C5	3	Provides priority parking for carpooling/vanpooling participants equivalent to 5% of employee spaces			
C6	5	Commercial Uses: Provide car-share spaces equivalent to 2% of building occupants			
C7	3	Parking is not located on major street frontage or between a road right of way and the building facade.			
C8	5	25% to 50% of parking is located underground or in a structure			

<b>C9</b>	<b>10</b>	50% to 75% of parking is located underground or in a structure		
<b>C10</b>	<b>15</b>	75% of parking or more is located underground or in a structure		
<b>C11</b>	<b>3</b>	Parking spaces provided off-site on a lot within 300 metres of the lot containing such use.	<b>X</b>	
<b>Category Max =</b>		<b>25</b>	<b>Total Points Applicable =</b>	<b>25</b>
			<b>Score =</b>	<b>25</b>



Region of Waterloo TDM Checklist v2.0

FORM-1

**Case Study:** Fieldgate SMUN Lands **Checklist No:** 0  
**Date:** April 13, 2022 **Site Context:** 0

TABLE D		Trip Reduction Incentives		
A formal TDM plan will identify specific initiatives that will be initiated in order to encourage reduced single occupant vehicle travel.				
Points		Features		N/A
<b>D1</b>	<b>2</b>	The building owner/occupant will make available a ride matching service for car/vanpooling		
<b>D2</b>	<b>2</b>	The building owner/occupant will make available emergency ride home options		
<b>D3</b>	<b>5</b>	The building owner/occupant will make available subsidized transit passes for all occupants for a period of two years		
<b>D4</b>	<b>5</b>	The building owner/occupant agrees to charge for parking as an unbundled cost to occupants		
<b>D5</b>	<b>2</b>	The building owner/occupant agrees to provide reduced cost parking for users of car/van pool, bicycle, moped/motorcycle spaces		
<b>D6</b>	<b>10</b>	The building owner/occupant has prepared a TDM plan to the satisfaction of the Region of Waterloo and the Area Municipality that targets a 10% reduction in peak hour trips using forecast trip generation with status quo travel characteristics		
<b>D7</b>	<b>5</b>	The employer has provided flexible working hours, telework or shift work arrangements.		
<b>D8</b>	<b>14</b>	The development agrees to join Travelwise (TMA) that provides the same services outlined under items D1, D2, D6	<b>X</b>	
<b>D9</b>	<b>5</b>	The building owner/occupant will make available car sharing services		
<b>D10</b>	<b>2</b>	The development includes mixed uses (i.e. retail, commercial or food services, daycares, or other complementary uses) on-site or located within 400 metres.	<b>X</b>	
<b>Category Max =</b>		<b>25</b>	<b>Total Points Applicable =</b>	<b>25</b>
			<b>Score =</b>	<b>14</b>

TABLE E		Checklist Summary		
For each item, a "Yes" answer is equivalent to the points as indicated in the section. N/A sections should be explained in an attachment to this table. The score for each section is reflected as a percentage and calculated by dividing the points by the "Total Applicable".				
Category	Minimum Requirement	Total Applicable	Points Scored	Comments
Pedestrian & Cyclist Orientation	24	10	8	
Public Transit Access		5	4	
Parking		25	25	
<b>SUB-TOTAL</b>		<b>40</b>	<b>37</b>	
<i>Trip Reduction Incentives</i>		25	14	
<b>OVERALL TOTAL</b>		<b>65</b>	<b>51</b>	

TABLE F		Scoring Summary	
FINAL SCORE	RATING (check one)		<b>TDM SUPPORTIVE DEVELOPMENT</b>
50 - 65	<b>****</b>	<b>X</b>	
40 - 49	<b>***</b>		
30 - 39	<b>**</b>		
24 - 29	<b>*</b>		
0 - 23			Non-TDM Supportive Development (Review and upgrade TDM elements to pass)

Comments:

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**Case Study:** Fieldgate SMUN Lands      **Site Context:** \_\_\_\_\_  
**Date:** April 13, 2022      **Reduction Worksheet No.:** \_\_\_\_\_

"Urban Growth Centres - (UGC) area classification includes the Downtown / Uptown and RT Station Areas of Kitchener, Waterloo and Cambridge.  
 "Intensification Corridor" (IC) classification is applied to sites within 800 metres of the future CTC line  
 "Other" classification applies to all other sites

Please highlight the cell percentages applicable to your development under the appropriate classification. Please note that the Parking Management Worksheet and the Transportation Demand Management (TDM) Checklist are not designed for residential properties, but can be used for mixed-use developments. Local municipalities are the decision-making bodies with respect to consideration of parking reductions below Zoning By-law requirements.

TABLE A		Pedestrian and Cyclist Orientation		
In creating an environment that supports pedestrian and cycling activity, the public realm must be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s). These facilities and features should encourage walking and cycling.				
	Features	UGC	IC	Other
A1	Development incorporates functional building entrances that are oriented to public space or to locations where pedestrians and transit users arrive from such as a street, square, park or plaza.	1%	1%	1%
A2	Continuous sidewalks (1.5m min. width) are provided along both sides of all adjacent public streets and pedestrian walkways (1.5m min width) are provided through large parking areas to link the building with the public street sidewalk system	0%	0%	1%
A3	Non-Residential: Development provides secure bike storage for 4% of the building occupants	2%	2%	1%
A4	Shower and change facilities provided on-site consistent with LEED requirements.	1%	1%	1%
A5	Provision of active uses at-grade along street frontages.	1%	1%	1%
<b>Category Maximum</b>		<b>4%</b>	<b>4%</b>	<b>4%</b>
<b>Available Parking Reduction</b>				<b>3%</b>

TABLE B		Public Transportation Access		
The availability and proximity of convenient public transit service with direct pedestrian linkages to the building will provide viable travel options for employees, visitors and residents.				
	Features	UGC	IC	Other
B1	Bus shelters with seating are provided at the transit stop immediately adjacent to the development, in consultation with Transportation Planning at the Region of Waterloo	0%	0%	1%
B2	Information regarding public transit routes, schedules and fares are provided in an accessible and visible location on site and in adjacent bus stops	0%	0%	1%
B3a	Located in an UGC or within 800 m of a future Rapid Transit Station	24%	12%	0%
B3b	Located within 600m a transit route with 15 minute headways (or less) or is located in a designated mixed use corridor or node. <b>Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.</b>	-	-	3%
B3c	Located within 400 metres of a bus service with headways of 15 min to 30 min. <b>Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.</b>	-	-	1%
<b>Category Maximum</b>		<b>24%</b>	<b>12%</b>	<b>5%</b>
<b>Available Parking Reduction</b>				<b>3%</b>

TABLE C		Parking		
Vehicle parking facilities can affect the character, travel mode and cost of a development. Reducing parking supply to match expected demand can have a positive influence on the selection of alternative travel modes.				
	Features	UGC	IC	Other
C1	Provides priority parking for carpooling/vanpooling participants equivalent to 5% of employee spaces	0%	0%	5%
C2	Commercial Uses: Provide car-share spaces equivalent to 2% of building occupants	2%	2%	0%
C3	Implements paid parking system on all or part of the site (e.g. parking permits, paid parking zones near main entrances)	2%	2%	1%
C4	Parking is not located on major street frontage.	0%	0%	1%
C5	25% to 50% of parking is located underground or in a structure	2%	1%	0%
C6	50% to 75% of parking is located underground or in a structure	4%	2%	0%

<b>C7</b>	75% of parking or more is located underground or in a structure	5%	3%	0%
	<b>Category Maximum</b>	<b>6%</b>	<b>4%</b>	<b>6%</b>
	<b>Available Parking Reduction</b>			<b>1%</b>



Case Study: Fieldgate SMUN Lands Site Context: 0  
 Date: April 13, 2022 Worksheet No: 0

TABLE D Trip Reduction Incentives				
A formal TDM plan will identify specific initiatives that will be initiated in order to encourage reduced single occupant vehicle travel.				
	Features	UGC	IC	Other
D1	The building owner/occupant will provide a ride matching service for car/vanpooling	0%	0%	1%
D2	The building owner/occupant will provide emergency ride home options	3%	2%	1%
D3	The building owner/occupant will provide subsidized transit passes for all occupants for a period of two years	10%	4%	2%
D4	The building owner/occupant agrees to charge for parking as a separate cost to occupants	10%	5%	2%
D5	The building owner/occupant agrees to provide reduced cost for users of car/van pool, bicycle, moped/motorcycle spaces	0%	0%	1%
D6	The development agrees to join Travelwise (TMA) that provides the same services outlined under items D1 and D2	9%	6%	4%
<b>Category Maximum</b>		<b>23%</b>	<b>11%</b>	<b>7%</b>
<b>Available Parking Reduction</b>				<b>7%</b>

TABLE E Parking Reduction Summary					
Please indicate the total reduction available based upon Tables A through D above.					
Category	Reduction Achieved	Maximum Achievable Reduction			Comments
		UGC	IC	Other	
Pedestrian & Cyclist Orientation	3%	4%	4%	4%	
Public Transit Access	3%	24%	12%	5%	
Parking	1%	6%	4%	6%	
Trip Reduction Incentives	7%	23%	11%	7%	
<b>TOTAL</b>	<b>14%</b>	<b>57%</b>	<b>31%</b>	<b>22%</b>	

TABLE F	TOTAL REDUCTION ACHIEVED	14%
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Comments:

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