TRANSPORTATION IMPACT, AND PARKING AND LOADING JUSTIFICATION STUDY UPDATE

69 & 117 JOHN STREET
RESIDENTIAL DEVELOPMENT

CITY OF MISSISSAUGA

PREPARED FOR:

CENTRACONDOS DE LA MONTAGNE

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
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SEPTEMBER 2024

CFCA FILE NO. 2378-6557

Revision Number	Date	Comments
Rev.0	April 2024	Internal Review
Rev.1	April 2024	Issued for First Submission
Rev.2	September 2024	Reissued for Submission

Executive Summary (UPDATED)

Background

Centracondos de la Montagne retained C.F. Crozier & Associates Inc. to prepare a Transportation Impact, and Parking and Loading Justification Study to support the Official Plan Amendment and Re-Zoning applications for the proposed mixed-use residential commercial development located at 69 & 117 John Street in the City of Mississauga. The purpose of this report is to assess the impacts of the proposed mixed-use residential commercial development on the study road network and recommends required mitigation measures, if warranted.

Per the Site Plan prepared by Tregebov Cogan Architecture, the development proposes three (3) residential buildings of 43, 34 and 16 storey heights, connected by a 6-storey podium. A total of 1,301 residential dwelling units and 700 m^2 of commercial space are included in the Proposed Development. Furthermore, a total of 888 vehicle parking spaces and 860 bicycle parking spaces are proposed for the development.

Two (2) accesses off of John Street are also proposed. A one-way inbound access (herein referred to as East Site Access) is proposed off John Street, forming the fourth leg of John Street & Little John Lane. An additional access of John Street (herein referred to as West Site Access) is proposed approximately 85 metres west of the East Site Access. It is noted that the West Site Access is proposed to be a one-way outbound access for passenger vehicles and a two-way access for trucks.

As confirmed in the Terms of Reference, the Transportation Impact, and Parking and Loading Justification Study analyzes the following intersections:

- Hurontario Street & John Street/Cooksville GO
- Hurontario Street & Hillcrest Avenue/Kirwin Avenue
- John Street & Jaguar Valley Drive
- Kirwin Avenue & Jaguar Valley Drive
- John Street & Little John Lane
- Kirwin Avenue & Little John Lane
- Dundas Street East & Kirwin Avenue/Camilla Road
- Hillcrest Avenue & Cooksville GO
- Proposed Site Accesses

Existing Conditions

New Turning Movement Counts (TMCs) at the study intersections were conducted at all the study intersections. However, due to the ongoing construction associated with the Hazel McCallion Light Rail Transit (LRT) within the study area, adjustments were made to establish the 2024 existing traffic volumes based on historic TMCs obtained from the City. The adjustments were made, as required, to account for Hazel McCallion LRT construction induced travel demand impacts, the addition of the west leg at Hurontario Street & John Street/Cooksville GO and to balance volumes between intersections along Hillcrest Avenue.

Under 2024 existing conditions, the study road network is operating at a Level of Service (LOS) “C” or better. The study intersections are currently operating efficiently with reserve capacity to accommodate future traffic growth.

Future Background Conditions

The following improvements to the transportation network are planned within the study area and were considered in the study analysis:

- Hazel McCallion LRT
- Hurontario Street Cycle Tracks

In addition, the following improvements to the transportation network are planned within the study area outside of the study horizon:

- Dundas Bus Rapid Transit
- GO Expansion
- Dundas Street Cycle Tracks

A combination of growth rates obtained from City staff, along with background development traffic volume forecasts were applied to determine traffic volumes for the 2029 future background conditions forecast.

Under 2029 future background conditions, traffic operations at the study intersections along Hurontario Street worsen somewhat compared to current traffic operations, while the remaining study intersections are forecast to operate similarly compared to existing conditions.

The Hazel McCallion LRT will result in increased delays due to the travel lane reduction, and northbound and southbound protect left-turn phases. The operations observed at Hurontario Street & John Street/Cooksville GO and Hurontario Street & Hillcrest Avenue & Kirwin Avenue are typical for transit corridors with protected left-turn phases. Moreover, the Ontario Ministry of Transportation’s Transit Supportive Guidelines (2012) online that congestion can motivate commuters to shift from automobile to sustainable modes and is acceptable for transit corridors.

Furthermore, the volumes used herein can be considered conservative as historic counts were used and may not fully capture the modal split impacts of the Hazel McCallion LRT.

A LOS “F” and “E” during the weekday a.m. and p.m. peak hours, respectively. Intersection volume-to-capacity ratios above the City’s critical threshold of 0.85 are also projected at the optimized signalized intersection of Hurontario Street & John Street/Cooksville GO during the weekday a.m. and p.m. peak hours. The eastbound left-turn and southbound left-turn movements are also forecast to experience high delays, volume-to-capacity ratios, and/or 95th percentile queues.

It is noted that the City can consider updating the lane configuration at the east approach of Hurontario Street & John Street/Cooksville GO to include exclusive left, through and right lanes instead of the planned exclusive left and through lane and shared through-right lane to accommodate the high number of westbound right-turn volumes projected. This lane configuration is expected to result in improved overall conditions during the weekday a.m. and p.m. peak hours, however, it is anticipated that intersection performance in practical conditions will be similar for both potential configurations.

At the optimized signalized intersection of Hurontario Street & Hillcrest Avenue/Kirwin Avenue, the intersection is expected to operate with a LOS "F" and "E" during the weekday a.m. and p.m. peak hours, respectively, with intersection volume-to-capacity ratios above 0.85. The eastbound left-turn and southbound left-turn movements are also expected to operate with high delays, volume-to-capacity ratios and/or 95th percentile queues . However, these conditions are typical of high volume urban areas during the GTHA, including the Hurontario Street corridor.

At the optimized signalized intersection of Dundas Street East & Kirwin Avenue/Camilla Road, a LOS "C" or better is forecast for the weekday peak hour periods. It is noted that the southbound left-turn movement 95th percentile queue exceeds the designated storage lane.

The City should monitor traffic volumes and queues post- Hazel McCallion LRT and post-Dundas BRT to determine if improvements for the southbound left-turn movement at Dundas Street East & Kirwin Avenue/Camilla Road are required. Should improvements be required, the City can consider adjusting the pavement markings, including on-street parking on the east, to extend the southbound left-turn lane storage.

The remaining study intersections are forecast to operate at a LOS "B" or better, with no delay, volume-to-capacity or queuing issues expected.

Site Generated Traffic

The multi-modal trip generation estimates were determined based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition; ITE Trip Generation Manual, 10th Edition; and ITE Trip Generation Manual, 3rd Edition. The Subject Development forecasted to generate 864 and 788 two-way external person trips during the weekday a.m. and p.m. peak hours, respectively. Of the person trips, 459 and 418 two-way external vehicle trips are expected during the weekday a.m. and p.m. peak hours, respectively.

Future Total Conditions

Under 2029 future total conditions, the overall study road network traffic operations are projected to be similar to those forecast for 2029 future background conditions.

As outlined for future background conditions, the City can consider updating lane configuration for the Hurontario Street & John Street/Cooksville GO east approach to include exclusive left, through and right lanes instead of the planned exclusive left and through lane and shared through-right lane.

With an exclusive westbound right-turn lane, the intersection of Hurontario Street & John Street/Cooksville GO is expected to operate at an unchanged LOS "E" or better during the weekday a.m. and p.m. peak hours in comparison to future background conditions. Furthermore, the intersection control delay and volume-to-capacity ratio is expected to increase by a maximum of 14 seconds and 0.08, respectively. Consistent with future background conditions, operational concerns with some movements, including the eastbound left-turn southbound left-turn movements, are expected, with LOS "F", volume-to-capacity ratios above 1.0 and/or queue exceedances.

Hurontario Street & Hillcrest Avenue/Kirwin Avenue is expected to operate at an unchanged LOS "F" and "E" during the weekday a.m. and p.m. peak hours, respectively, in comparison to future background conditions. A maximum increase of 19 seconds in intersection control delay and 0.05 in intersection volume-to-capacity ratio is also expected. Some movements are also expected to operate with a LOS "F", volume-to-capacity ratios above 1.0 and/or extended queues, however, this is consistent with future background conditions.

The optimized signalized intersection of Dundas Street East & Kirwin Avenue/Camilla Road is expected to operate with an unchanged LOS "C" during the weekday a.m. and p.m. peak hours when compared to future background conditions. The intersection is expected to operate with an increase in control delay of 6 seconds and an increase in volume-to-capacity ratio of 0.06. Consistent with future background conditions, some movements are expected to have some operational concerns, including the southbound left-turn movement where the 95th percentile queue exceeds the provided storage.

The City should continue to monitor traffic volumes and queues post- Hazel McCallion LRT and post-Dundas BRT to determine if improvements for the Dundas Street East & Kirwin Avenue/Camilla Road southbound left-turn movement are required. Should improvements be required, the City can consider implementing an alternate optimized signal timing plan for the a.m. peak hour, which allocates additional green time to the minor approaches, as well as the previously recommended storage length extension.

The remaining study intersections are expected to efficiently operate at an unchanged LOS "B" or better when compared to future background conditions, with no delay, capacity, or queueing concerns.

Overall, the Subject Development does not materially impact the traffic operations at any of the study intersections. Moreover, the operational issues observed under future total conditions is consistent with future background conditions. As such, the Subject Development is supportable from a transportation operations perspective and not further improvements, beyond those outlined below, are required.

The signal warrants for the unsignalized intersections, including the two (2) proposed Site Accesses off John Street, were found to be not warranted, indicating that a stop controlled intersection is appropriate for these intersections.

The all-way stop control (AWSC) warrant at John Street & Little John Lane was found to be warranted, indicating that that AWSC is appropriate for this intersection based on the expected vehicle and pedestrian traffic volumes.

Site Access Review

The available sight distance at the proposed outbound access (West Site Access) exceeds the minimum requirements set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) (June 2017).

The proposed access spacing, and corner clearance exceeds the recommended minimum intersection spacing and corner clearance guidelines outlined in TAC GDGCR.

Overall, the two (2) proposed site accesses are supportable from an intersection sight distance, access spacing and corner clearance perspectives.

Site Circulation Review

The Vehicle Turning Diagrams were prepared for the typical Region of Peel Waste Collection Vehicle, typical Region of Peel Fire Truck, medium single unit (MSU) truck (delivery trucks), and the TAC p-car. The vehicle circulation review for the key design vehicles listed above demonstrate that the Site Plan is supportable from a vehicle circulation perspective.

The Site Plan also proposes pedestrian facilities that support safe pedestrian circulation throughout the Subject Site and connect to the existing external pedestrian network.

Parking Review

Per the City of Mississauga Zoning By-Law 0225-2007, the Subject Development is required to provide 1,301 vehicle parking spaces. As the 888 vehicle parking spaces are proposed, a parking deficit is proposed. However, the proposed parking rate of 0.50 space per unit and 0.11 space per unit for residents and visitors, respectively, is expected to be sufficient when considering the proposed and approved parking rates as well as surrogate site surveys for developments in similar transportation contexts.

It can also be concluded that the City's existing parking rates would likely be an overestimation of expected parking demand for the Proposed Development, especially considering the Subject Site is situated in the Cooksville GO Protected Major Transit Station Area, with direct access to higher order transit.

In addition, City staff has recommended that a reduced parking requirement of 0.50 space per unit and 0.15 space per unit for residents and visitors, respectively, be implemented for residential uses along the Hurontario LRT corridor. The proposed parking rate of 0.61 space per unit only results in a minor deficiency.

As part of Bill 185, the Province recently removed the minimum parking rates for all new developments, except Universities, within PMTSAs. As the Subject Site is located within the Cooksville GO PMTSA, the minimum parking requirement for the Subject Development is zero (0) spaces. As the development proposes 822 parking spaces, the proposed parking supply satisfies this minimum requirement. Accordingly, the proposed parking rate is acceptable.

Furthermore, the proposed parking rate of 0.50 space per unit and 0.11 space per unit for residents and visitors, respectively, is expected to be sufficient when considering the proposed and approved parking rates as well as surrogate site surveys for developments in similar transportation contexts.

Based on the required 281 visitor parking spaces, a minimum of eight (8) accessible parking spaces are required. As the Site Plan proposes 18 accessible parking spaces, the Zoning By-Law accessible requirements are exceeded.

To support the Proposed Development, a total of 783 Class A and 68 Class B bicycle parking spaces are required. The Site Plan proposes 860 bicycle parking spaces, comprised of 790 Class A and 70 Class B spaces, thus, the Zoning By-Law bicycle parking requirements are exceeded.

Loading Review

Per the City of Mississauga Zoning By-Law 0225-2007, four (4) loading spaces are required to support the Subject Development. As one (1) official loading space is provided, a deficit is proposed.

The demand of the loading space and pick-up/drop-off (PUDO)/loading zone will be managed via a booking system. This will ensure that the loading space and PUDO/loading zone is available when required for waste collection, and residential and commercial tenants can arrange move-ins and/or deliveries at alternate times on a first-come, first-serve basis.

While the PUDO/loading zone does not meet the City's loading space dimension requirements, it can sufficiently accommodate two (2) MSU trucks or four (4) passenger cars are one time. Despite the dimensions of this zone being technically deficient, functionally the PUDO/loading zone is sufficient to address the Subject Development's needs.
Smaller delivery vehicles that typically do not utilize a loading space are expected to use the additional lay-by parking spaces on-site.

Transportation Demand Management

The recommended TDM measures, outlined in **Table E1**, results in a 5 Star rating per the City's Transportation Demand Management and Pedestrian Circulation Checklist. These recommendations align with the Subject Development being a transit oriented development.

Conclusions and Recommendations

Table E1 outlines the recommendations resulting from the conclusions and findings of this study.

Table E1: Recommended Improvements Summary

Intersection	Improvement	Responsibility
2029 Future Background		
Hurontario Street & John Street/Cooksville GO	Consider implementing an exclusive westbound right-turn movement, instead of a shared westbound through-right-turn movement. Optimize signal timing plan. Consider updating the Hazel McCallion LRT design drawings and revise the planned pavement markings to extend the southbound left-turn lane storage length to at least 65 metres.	City
Hurontario Street & Hillcrest Avenue/Kirwin Avenue	Optimize signal timing plan. Consider updating the Hazel McCallion LRT design drawings and revise the planned pavement markings to maximize the southbound left-turn lane storage length.	City

Intersection	Improvement	Responsibility
Dundas Street East & Kirwin Avenue/Camilla Road	Optimize signal timing plan. Monitor traffic volumes post- Hazel McCallion LRT and post-Dundas BRT to determine if improvements are required, including: • Adjust pavement markings, including the start of on-street parking on the east side, to extend the southbound left-turn lane storage.	City
2029 Future Total		
Hurontario Street & John Street/Cooksville GO	Consider revising the planned pavement markings to maximize the southbound left-turn lane storage length. Consider providing westbound left-turn lane storage length of at least 65 metres.	City/Developer
Dundas Street East & Kirwin Avenue/Camilla Road	Continue to monitor traffic volumes post-Hazel McCallion LRT and post-Dundas BRT to determine improvements are required, including: • Adjust pavement markings, including the start of on-street parking on the east side, to extend the southbound left-turn lane storage. • Adjust the signal timing plans (Signal Optimized #2) for the weekday a.m. peak period to increase the green time for the southbound left-turn and/or minor approach movements,	City
John Street & Little John Lane	Implement AWSC.	Developer

Intersection	Improvement	Responsibility
Proposed Development	Implement the following site safety measures: • Convex mirrors within parking and loading areas. • Vehicle warning system with lights at the loading entrances and parking exits. Implement the following transportation demand management (TDM) strategies: • TDM Information Package for New Tenants • TDM Coordinator • Smart Commute Membership • Wayfinding Signage • Flex Workspace Amenity Spaces • Pick-up/Drop-off Area(s) • Subsidized Transit Passes • Real-Time Transit Information Screens • Secure & Excess Bicycle Parking Spaces • Bicycle Repair Station • Reduced Parking Supply • Unbundled Parking • Carshare Spaces	Developer

In conclusion, the traffic generated from the proposed mixed-use residential commercial development can be accommodated by the study road network along with the identified improvements herein. As such, the Development Proposal can be supported from a transportation operation, parking, loading, site circulation and safety perspective.

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1.0 Introduction

Centracondos de la Montagne retained C.F. Crozier & Associates Inc. (Crozier) to complete a Transportation Impact, and Parking and Loading Justification Study to support the proposed mixed-use residential commercial development located at 69 & 117 John Street in the City of Mississauga.

1.1 Developments Lands

The Subject Property covers an area of approximately 1.87 hectares and is currently a paved vacant lot. The Subject Site is located within a mixed-use residential and commercial neighbourhood and is bound by a CN railway to the north, residential dwellings to the east, John Street to the south and a self-storage facility to the west.

Figure 1 illustrates the site location.

Figure 1: Site Location

1.2 Development Proposal (UPDATED)

The Site Plan, prepared by Tregebov Cogan Architecture, proposes a mixed-use residential commercial development. **Table 1** outlines the proposed site statistics.

Table 1: Development Proposal (Comparison)

Site Plan	April 2024	September 2024
Residential	1,301 units	1,342 units (+41 units)
Commercial	700 m²	600 m² (-100 m²)
Parking Supply		
Vehicle Parking	888 spaces	822 spaces (-66 spaces)
Bicycle Parking	860 spaces	860 spaces

The Proposed Development is comprised of a total of 1,342 residential units and 600 m² of commercial space, with 822 vehicle parking spaces and 860 bicycle parking spaces. In comparison to the previous submission (Crozier, April 2024), the updated Development Proposal includes an increase of 41 residential units and a decrease of 100 m² of commercial space as well as a decrease of 66 vehicle parking spaces.

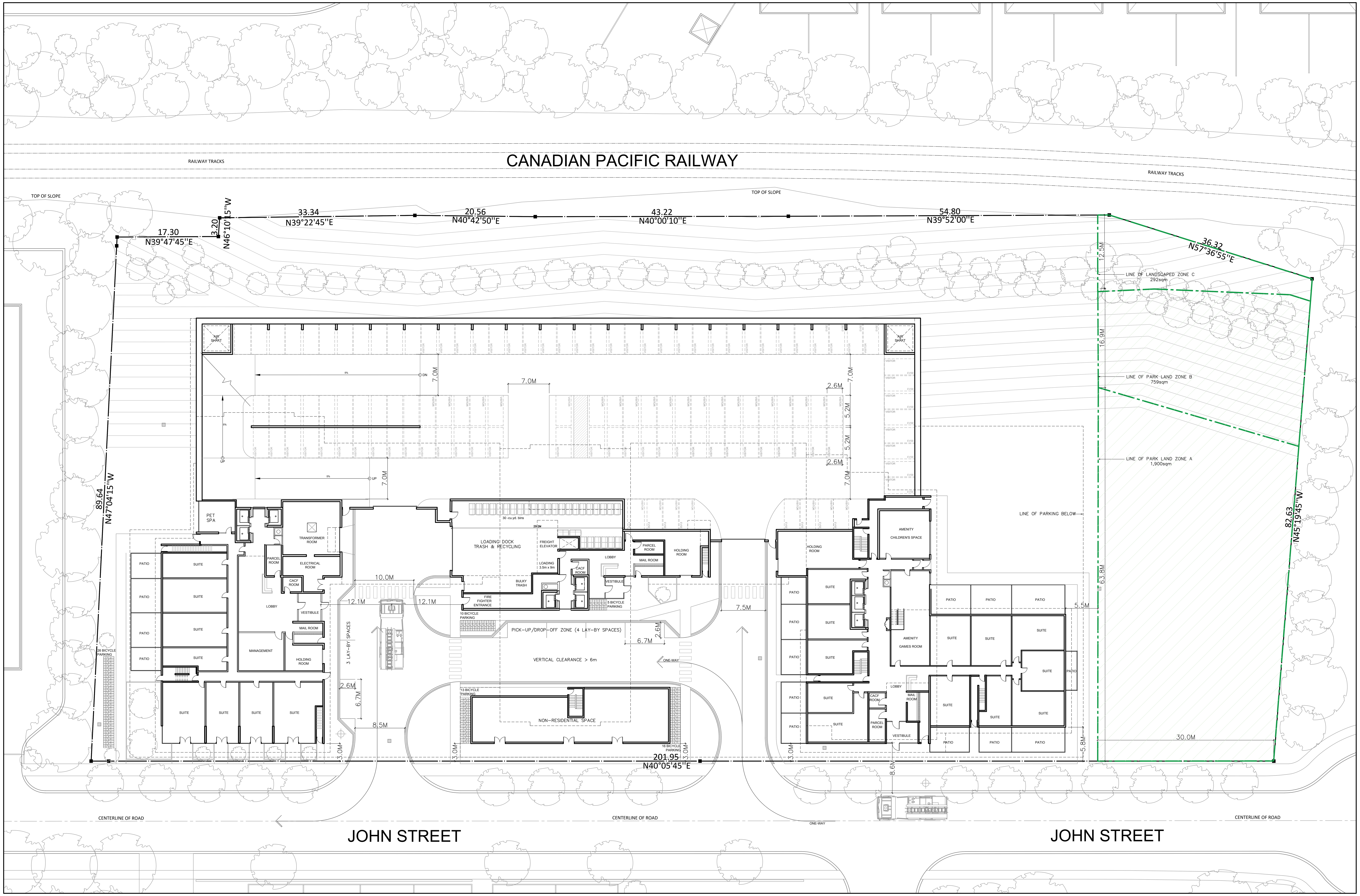
The most recent Site Plan outlines an updated access configuration, in comparison to the initial Development Proposal, to address City Fire staff comments. **Table 2** outlines the updated access configuration.

Table 2: Access Configuration (Comparison)

Access	Direction	Location[1]	
		April 2024	September 2024
East Site Access	One-Way Inbound	At John Street & Little John Lane	23 m west of John Street & Little John Lane
West Site Access	Two-Way[2]	85 m west of John Street & Little John Lane	85 m west of John Street & Little John Lane

Note 1: Distance from centreline to centerline.
Note 2: One-way outbound for passenger vehicles and two-way for trucks, such as waste collection vehicles.

Figure 2 outlines the most recent Site Plan, dated September 11, 2024. **Appendix A** includes the full architectural set.



1 F1/SITE PLAN

1:300

CONSULTANTS:

DATE	No.	ISSUE
2024-09-11	01	FOR COORDINATION

ARCHITECT:

TREGEBOV COGAN *ARCHITECT*

40 Saint Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
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OWNER:

PROJECT NAME:

69 & 117 JOHN ST.
MISSISSAUGA

DRAWING TITLE:

F1/SITE PLAN

PRINT DATE: 11-SEPT 2024

NORTH

PROJ. No.: 1101

DEV APPLICATION NO:

SCALE: AS NOTED

DWG NO. **A2.2**

DRAWN BY: KT

1.3 Study Purpose and Scope

The purpose of the study is to evaluate the transportation-related impacts of the Proposed Development on the study road network and to recommend or confirm any required mitigation measures, if warranted. This Transportation Impact, and Parking and Loading Justification Study is in support of an Official Plan Amendment and a Zoning By-law Amendment application.

The study reviews the following main aspects of the Proposed Development from a transportation engineering perspective:

- Impacts of development traffic on the study road network through analyzing existing, future background, and future total traffic operations.
- External roadway improvements to mitigate traffic impacts, if required.
- Proposed Site Plan, including Site Accesses, from a vehicle circulation and safety perspective.
- Adequacy of the proposed parking and loading supply.
- Existing, future, and site-specific Transportation Demand Management opportunities.

The study has been completed in accordance with the City of Mississauga's Transportation Impact Study Guidelines (December 2022) as well as the agreed upon Terms of Reference with the City of Mississauga staff. **Appendix B** includes the Terms of Reference.

As confirmed in the Terms of Reference, the Transportation Impact, and Parking and Loading Justification Study considers the following study intersections:

- Hurontario Street & John Street/Cooksville GO
- Hurontario Street & Hillcrest Avenue/Kirwin Avenue
- John Street & Jaguar Valley Drive
- Kirwin Avenue & Jaguar Valley Drive
- John Street & Little John Lane
- Kirwin Avenue & Little John Lane
- Dundas Street East & Kirwin Avenue/Camilla Road
- Hillcrest Avenue & Cooksville GO
- Proposed Site Accesses

For the purposes of this study, it has been assumed that Subject Development will be built out within the next five (5) years. Therefore, the study horizon of 2029 was analyzed, consistent with the City's guidelines and in accordance with the Terms of Reference.

2.0 Existing Conditions

This section outlines the current conditions of the transportation network in the vicinity of the site. Details of the study road network, including traffic controls, lane configurations, speed limits, transit routes and stops, active transportation infrastructure and other relevant transportation elements are identified. The existing traffic operations are also summarized.

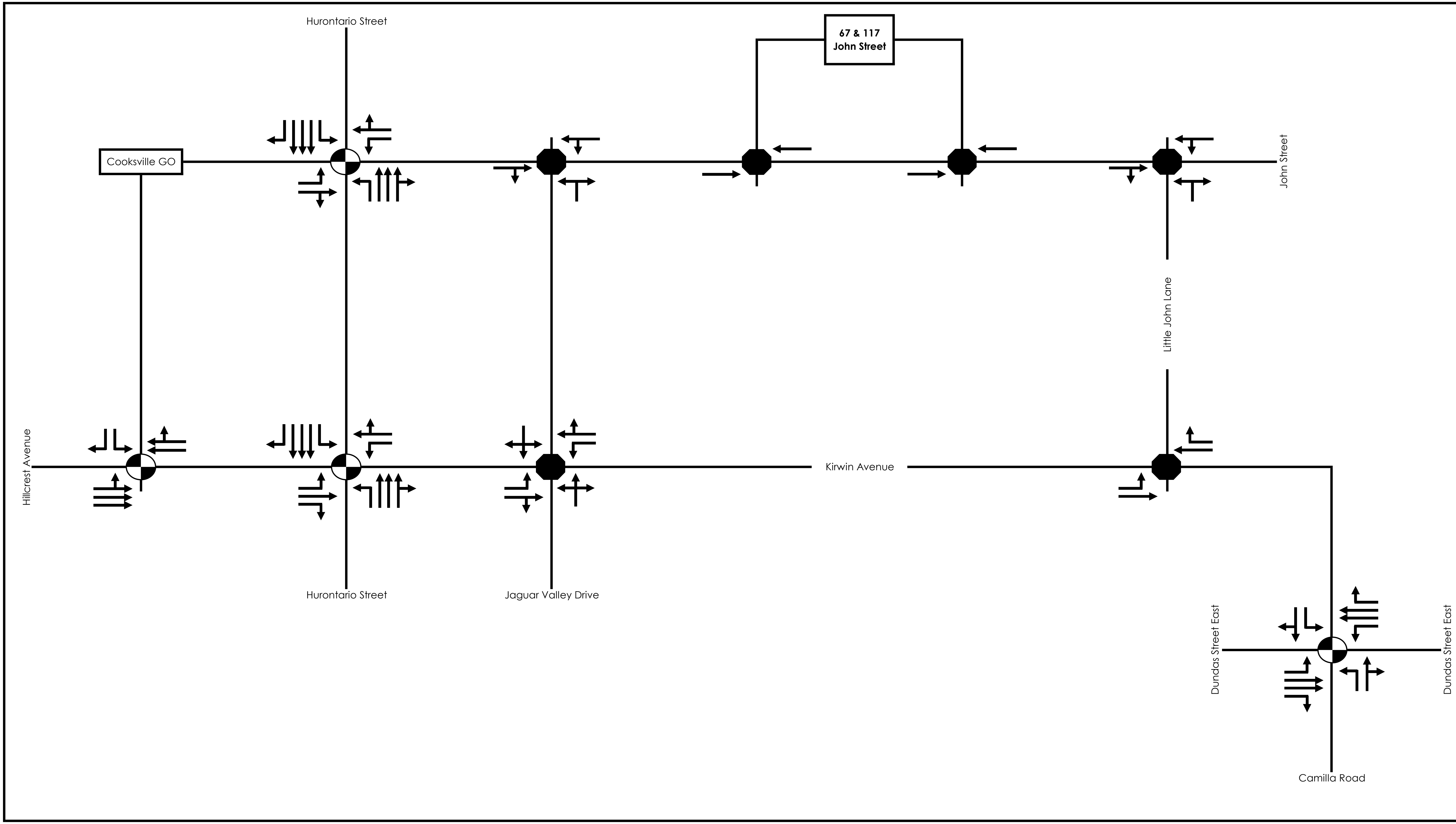
2.1 Study Road Network

The study road network consists of the existing road network near the site, which includes the study intersections and the adjoining roadway segments. **Table 3** outlines the features of the study roadways. **Figure 3** illustrates the existing study road network, including the lane configurations and intersection control at the study intersections.

Table 3: Study Roadways

Feature[1]	Roadway							
	Hurontario Street	**Dundas Street**	**Kirwin Avenue**	**Camilla Road**	**Hillcrest Avenue**	**John Street**	**Jaguar Valley Drive**	**Little John Lane**
Direction	Two-Way (North-South)	Two-Way (East-West)	Two-Way (East-West/ North-South)	Two-Way (North-South)	Two-Way (East-West)	Two-Way (East-West)	Two-Way (North-South)	Two-Way (North-South)
Classification	Major Arterial	Major Arterial	Major Collector	Minor Collector	Major Collector	Local	Local	Local
Jurisdiction	City of Mississauga	City of Mississauga	City of Mississauga	City of Mississauga	City of Mississauga	City of Mississauga	City of Mississauga	City of Mississauga
Speed Limit[1]	50 km/h	50 km/h	40 km/h	40 km/h	50 km/h	40 km/h	40 km/h	40 km/h
Span	North City Boundary to Lakeshore Road East	West City Boundary to East City Boundary	Hurontario Street to Dundas Street	Dundas Street to North Service Road	Mavis Road to Hurontario Street	Cooksville GO Station to East Terminus	John Street to Dundas Street	John Street to Kirwin Avenue
Number of Lanes	Six Travel Lanes[2]	Four Travel Lanes	Two Travel Lanes	Two Travel Lanes	Four Travel Lanes	Two Travel Lanes	Two Travel Lanes	Two Travel Lanes
Median Type	Paved[2]	Two-Way Left-Turn Lane	None	None	Two-Way Left-Turn Lane	None	None	None
Pedestrian Facilities	Sidewalks (both sides)	Sidewalk (both sides)	Sidewalk (both sides)	Sidewalk (both sides)	Sidewalk (both sides)	Sidewalks (both sides)	Sidewalks (both sides)	Sidewalks (both sides)
Cycling Facilities	None	None	On-Street Bike Lane (both sides)	On-Street Bike Lane (both sides)	None	None	None	None

Note 1: Features listed for study area only. Features may vary for each roadway beyond the study area.
Note 2: Hurontario Street is currently under construction as part of the future Hazel McCallion Light Rail Transit works. Refers to pre-construction conditions.



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

69 & 117 John Street

Existing Study Road Network

CROZIER CONSULTING ENGINEERS

Figure 3
Project No. 2378-6557
Date. 2024.09.17
Analyst. MY

2.2 Transit Operations

MiWay and GO Transit service operates bus and commuter rail service within the study area. **Table 4** outlines the existing transit routes, direction, days of operation, peak hour headways, and the location of bus stops in the study area as of February 2024.

Table 4: Existing Transit Services

Route	Direction	Limits	Days of Operation	Peak Hour Headway[1]	Transit Stops in Study Area
MiWay 1 Dundas	Two-Way (East-West)	Kipling Bus Terminal to Laird Rd/ Ridgeway Dr	Monday to Sunday	7 – 20 min	Dundas St & Kirwin Ave/ Camilla Rd
MiWay 2 Hurontario	Two-Way (North-South)	City Centre Transit Terminal to Port Credit GO Station	Monday to Sunday	8 – 15 min	Hurontario St & John St
MiWay 3 Bloor	Two-Way (East-West)	Kipling Bus Terminal to City Centre Transit Terminal	Monday to Sunday	10 – 20 min	n/a[2]
MiWay 4 Sherway Gardens	Two-Way (East-West)	Sherway Gardens to Cooksville GO Station	Monday to Sunday	30 – 40 min	Cooksville GO Station
MiWay 28 Confederation	Two-Way (North-South)	City Centre Transit Terminal to Trillium Health Care	Monday to Sunday	15 – 20 min	Cooksville GO Station[3]
MiWay 38 Creditview	Two-Way (North-South)	Meadowvale Town Centre to Cooksville GO Station	Monday to Friday	20 – 30 min	Cooksville GO Station
MiWay 53 Kennedy	Two-Way (North-South)	Hurontario/ Highway 407 Park & Ride to Cooksville GO Station	Monday to Friday	15 – 20 min	Hurontario St at John St; Cooksville GO Station
MiWay 101 Dundas Express	Two-Way (East-West)	Kipling Bus Terminal to South Common Centre	Monday to Friday	5 – 10 min	n/a[4]
MiWay 103 Hurontario Express	Two-Way (North-South)	Brampton Gateway Terminal to Trillium Health Centre	Monday to Sunday	15 – 20 min	Hurontario St & John St
GO 21 Milton[5]	Two-Way (East-West)	Milton GO to Union Station	Monday to Sunday	15 – 30 min	Cooksville GO Station

Note 1: Frequency and operations may have changed due to current pandemic and change in travel demands.
Note 2: MiWay Route 3 (Bloor) does not have a bus stop at any of the study intersections. The nearest bus stop is at Mississauga Valley Drive Boulevard & Fairview Road.
Note 3: Peak hour service only.
Note 4: MiWay Route 101 (Dundas Express) does not stop at any of the study intersections. The nearest bus stop is at Hurontario Street & Dundas Street.
Note 5: Includes both GO Train and GO Bus services.

Cooksville GO Station is located approximately 550 metres west of the subject property (approximately 8-minute walk). This station is serviced by GO Bus and Train routes that operate with high frequencies during weekday peak periods and provide quick connectivity to the Greater Toronto Hamilton Area (GTHA) and surrounding areas. It is noted that the Milton GO line does not currently provide all-day two-way service via GO Train. Peak hour headways are currently only provided for eastbound service in the morning and westbound service in the afternoon.

As shown above, the study area is well served by numerous frequent local and regional transit services. Residents and visitors of the Subject Property may access the site and other destinations within the GTHA using transit with ease.

Appendix C contains the relevant existing transit information.

2.3 Transportation Data

A variety of transportation data was obtained and used to support the analysis in this study and is summarized in the section herein.

Turning movement counts (TMCs) were conducted by Spectrum Traffic at all the study intersections. The TMCs were conducted on a weekday between 6:30 a.m. to 9:30 a.m., and 3:30 p.m. to 6:30 p.m. to reflect typical commuter peak hours.

Due to the ongoing construction for the Hazel McCallion Light Rail Transit (LRT), historic data was also used for the study intersections along the Hurontario Street corridor as well as at the Cooksville GO accesses. Historic TMCs and signal timing plans, prior to construction, were received from the City and used.

For the remaining study intersections, not along the Hurontario Street corridor, the most recent signal timing plan was received from the City and used.

Appendix D contains the traffic count data and signal timing plans. **Table 5** summarizes the TMCs and signal timing plans.

Table 5: Turning Movement Count and Signal Timing Plan Data

<table>
<tr><th rowspan="2">Intersection</th><th colspan="2">Turning Movement Count</th><th colspan="2">Signal Timing Plan</th></tr>
<tr><th>Date</th><th>Source</th><th>Date</th><th>Source</th></tr>
<tr><td rowspan="2">Hurontario Street & John Street/Cooksville GO</td><td>Tues May 5, 2015</td><td>City</td><td rowspan="2">Dec 18, 2020</td><td rowspan="2">City</td></tr>
<tr><td>Thurs Feb 8, 2024</td><td>Spectrum</td></tr>
<tr><td rowspan="2">Hurontario Street & Hillcrest Avenue/Kirwin Avenue</td><td>Tues Nov 22, 2016</td><td>City</td><td rowspan="2">Dec 18, 2020</td><td rowspan="2">City</td></tr>
<tr><td>Thurs Feb 8, 2024</td><td>Spectrum</td></tr>
<tr><td>John Street & Jaguar Valley Drive</td><td>Tues Jan 31, 2023</td><td>Spectrum</td><td>n/a</td><td>n/a</td></tr>
<tr><td>Kirwin Avenue & Jaguar Valley Drive</td><td>Tues Jan 31, 2023</td><td>Spectrum</td><td>n/a</td><td>n/a</td></tr>
<tr><td>John Street & Little John Lane</td><td>Tues Jan 31, 2023</td><td>Spectrum</td><td>n/a</td><td>n/a</td></tr>
<tr><td>Kirwin Avenue & Little John Lane</td><td>Tues Jan 31, 2023</td><td>Spectrum</td><td>n/a</td><td>n/a</td></tr>
<tr><td>Dundas Street East & Kirwin Avenue/Camilla Road</td><td>Tues Jan 31, 2023</td><td>Spectrum</td><td>Feb 10, 2023</td><td>City</td></tr>
<tr><td rowspan="2">Hillcrest Avenue & Cooksville GO</td><td>Tues May 5, 2015</td><td>City</td><td rowspan="2">Feb 13, 2024</td><td rowspan="2">City</td></tr>
<tr><td>Thurs Feb 8, 2024</td><td>Spectrum</td></tr>
</table>

2.3.1 AADT Data

To calculate the historic growth rate, available annual average daily traffic (AADT) was obtained for Hurontario Street between Agnes Street and Hillcrest Avenue. The AADT surveys for 2016 and 2018 was obtained from the City. Further details are included in **Section 2.4.1**.

Appendix D contains the AADT data.

2.4 Establishing Existing Traffic Volumes

Due to the ongoing construction associated with the Hazel McCallion LRT along the Hurontario Street corridor, new traffic volumes conducted were not accurate as the volumes were artificially suppressed. The historical TMCs for the study intersections along Hurontario Street were obtained from the City.

2.4.1 Growth Rates

<u>Hurontario Street</u>

The City only provides a one-time total growth factor for Hurontario Street, which represents the reduction in travel lanes along Hurontario Street associated with the Hazel McCallion LRT. As such, to forecast the historic TMCs along Hurontario Street to 2024 volumes, a historic growth rate was calculated using AADT volumes. **Table 6** outlines the AADT volumes and historic growth rate calculated along Hurontario Street, between Agnes Street and Hillcrest Avenue.

Table 6: Hurontario Street Historic Growth Rate

Location	Year	AADT
Hurontario Street (between Agnes Street and Hillcrest Avenue)	2016	44,659
	2018	36,340
Growth Rate		**-9.8%**

As outlined in **Table 6**, negative growth was observed along Hurontario Street, between 2016 and 2018. Thus, as confirmed with City staff, a conservative growth rate of 0.0% was used to grow the volumes along Hurontario Street to 2024 volumes.

Remaining Study Roadways

With the exception of the intersections along Hurontario Street, the TMCs at all other study intersections were conducted in 2023 or later. As such, the growth rates for all other collector and arterial study roadways provided by City staff and based on the City's growth model are applicable.

Moreover, a 0.0% growth rate was applied to all local study roadways, as confirmed with City staff, as these roads only carry local accesses and the only growth expected would be through redevelopment.

Summary

Table 7 outlines the growth rates used to forecast historic volumes to 2024 existing volumes, as confirmed with City staff.

Table 7: Road Network Growth Rates

Corridor	Direction	A.M.	P.M.
Hurontario Street	Northbound	0.0%	0.0%
	Southbound	0.0%	0.0%
Dundas Street East	Eastbound	0.0%	0.5%
	Westbound	1.0%	0.0%
Kirwin Avenue/Hillcrest Avenue	Eastbound	0.5%	0.5%
	Westbound	0.5%	0.5%
Kirwin Avenue/Camilla Road	Northbound	0.5%	0.5%
	Southbound	0.5%	0.5%
John Street	Eastbound	0.0%	0.0%
	Westbound	0.0%	0.0%
Jaguar Valley Drive	Northbound	0.0%	0.0%
	Southbound	0.0%	0.0%
Little John Lane	Northbound	0.0%	0.0%
	Southbound	0.0%	0.0%

2.4.2 Baseline Volumes

Hurontario Street & John Street/Cooksville GO Access

The historic 2015 and new 2024 TMCs at Hurontario Street & John Street/Cooksville GO were reviewed. It is noted that the 2015 counts were prior to the Cooksville GO Station improvements and build out of the west leg.

As part of the Cooksville GO Station improvements, a new station building and parking structure was built as well as a new pick-up drop-off area among other improvements. John Street was also extended west of Hurontario Street, connecting to the Cooksville GO Station and converting the intersection from a three-legged intersection to a four-legged intersection.

Moreover, the Cooksville GO parking lots off John Street, east of Hurontario Street have been removed due to the new parking facilities at the station. The impact of this is reflected in the reduced volumes east of Hurontario Street observed in the new 2024 counts.

It is noted that lane reductions were observed in 2024 at the time of conducting the counts. However, there were no movement restrictions at the Hurontario Street & John Street/Cooksville GO observed that would impact the turn movements.

All the eastbound and westbound volumes, as well as the northbound and southbound turning movements from the 2024 TMCs were used due to the impact of the Cooksville GO Station improvements, addition of the west leg of the intersection, and the removal of the Cooksville GO parking lots east of Hurontario Street not being accounted for in the historic counts.

For the northbound and southbound through movements, the historic 2015 volumes were forecasted to 2024 volumes based on the growth rates outlined in **Table 7**, as these movements were impacted by construction along Hurontario Street.

Hurontario Street & Hillcrest Avenue/Kirwin Avenue

The historic 2016 and new 2024 TMCs at Hurontario Street & Hillcrest Avenue/Kirwin Avenue were reviewed. It is noted that the southbound right-turn movement was physically restricted for most of the time at which the new 2024 TMC was conducted. As such, the historic 2016 TMCs were used and were grown to 2024 volumes using the growth rates outlined in **Table 7**.

The west approach of Hurontario Street & John Street/Cooksville GO was built out after the 2016 TMCs were conducted. As such, adjustments were made to account for Cooksville GO trips that will now utilize the access off Hurontario Street instead of the access off Hillcrest Avenue. The southbound right and northbound left volumes observed at Hurontario Street & John Street/Cooksville GO were removed from the corresponding movement at Hurontario Street & Hillcrest Avenue/Kirwin Avenue. The northbound left volumes observed at Hurontario Street & John Street/Cooksville GO were also added to the northbound through movement at Hurontario Street & Hillcrest Avenue/Kirwin Avenue.

Remaining Study Intersections

The TMCs at the following study intersections were conducted in 2023 and were grown to 2024 volumes using the growth rates outlined in **Table 7**:

- John Street & Jaguar Valley Drive
- John Street & Little John Lane
- Kirwin Avenue & Little John Lane
- Dundas Street & Kirwin Avenue/Camilla Road

Lastly, the TMC at the Hillcrest Avenue & Cooksville GO intersection was conducted in 2024. As such, no additional growth needs to be accounted for.

2.4.3 GO Access Adjustments

The trips to/from the Cooksville GO occurring during the 2015 and 2024 TMCs were compared and some discrepancies in the number of trips observed. **Table 8** outlines the observed Cooksville GO trips.

Table 8: Observed Cooksville GO Trips

Year	A.M.		P.M.	
	In	Out	In	Out
2015	573 trips	521 trips	374 trips	734 trips
2024	600 trips	377 trips	269 trips	460 trips
Difference	**+27 trips**	**-144 trips**	**-105 trips**	**-274 trips**

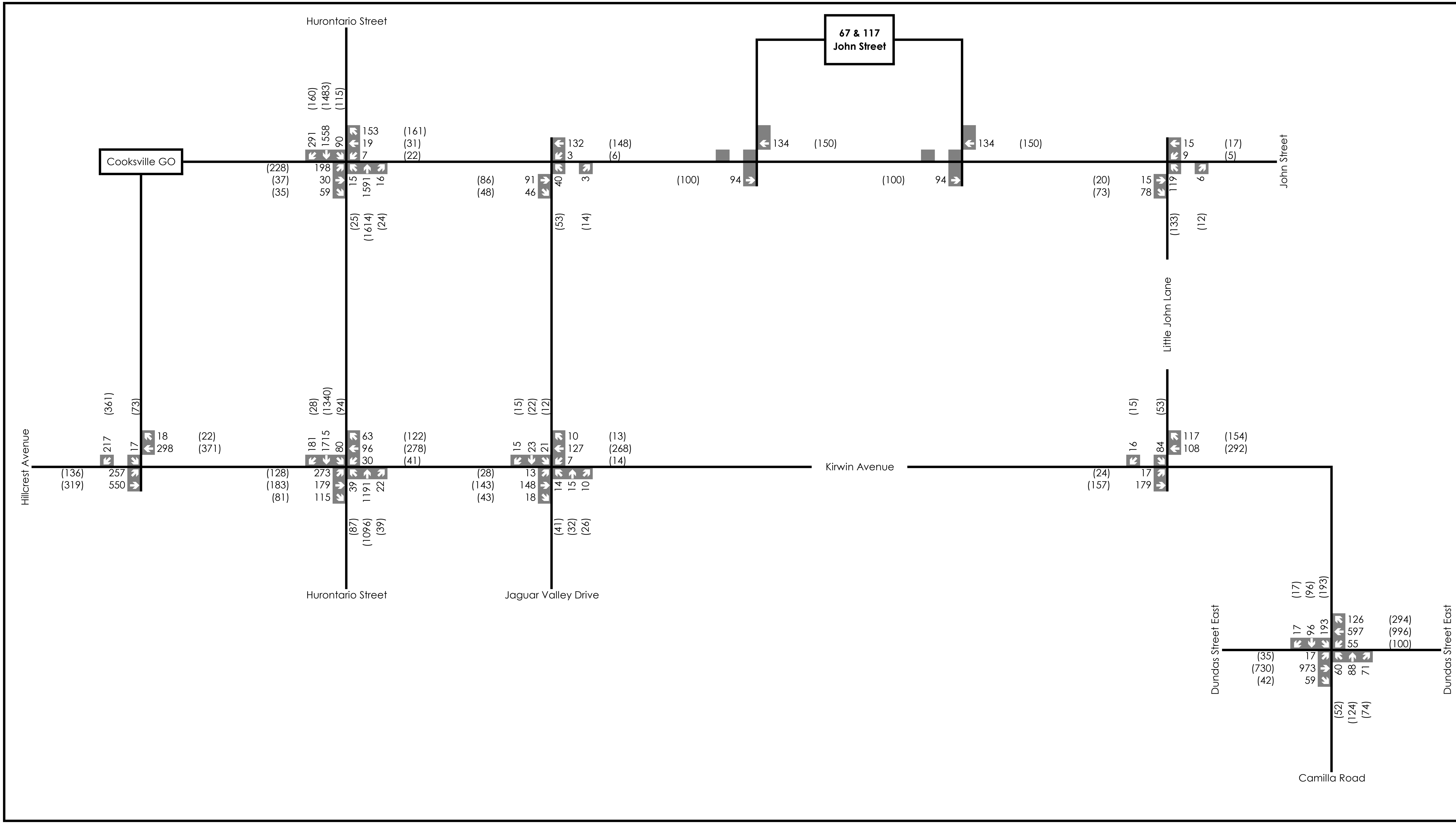
As outlined in **Table 8**, fewer a.m. outbound, p.m. inbound and p.m. outbound trips were observed in the 2024 TMCs. Thus, further adjustments were made to the baseline volumes outlined in **Section 2.4.2**. It is noted that no adjustments were made to the a.m. inbound trips as more trips were observed in 2024 than in 2015.

The additional trips were added at the Hurontario Street & John Street/Cooksville GO and Hillcrest Avenue & Cooksville GO intersections based on the travel patterns observed in the 2024 TMC.

It is noted that the eastbound trips along Hillcrest were also distributed to the eastbound through and eastbound right movements at Hurontario Street & Hillcrest Avenue/Kirwin Avenue based on the 2024 travel patterns. The northbound trips on Hurontario Street were also distributed to the northbound through movements at Hurontario Street & Hillcrest Avenue/Kirwin Avenue.

Lastly, the eastbound and westbound through volumes at Hillcrest Avenue & GO Access were also balanced with the volumes at Hurontario Street & Hillcrest Avenue/Kirwin Avenue.

Figure 4 outlines the 2024 existing traffic volumes used for existing analysis.



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

69 & 117 John Street

2024 Existing Traffic Volumes

CROZIER CONSULTING ENGINEERS

Figure 4
Project No. 2378-6557
Date. 2024.09.17
Analyst. MY

2.5 Traffic Modelling and Assumptions

The intersection operations were modelled in conformance with the City of Mississauga's Transportation Impact Study Guidelines (December 2022). For parameters where guidelines were not provided, default values were used for the modelling of existing conditions.

Consistent with the City's guidelines, a lost time adjustment of -1.0 second was applied to all movements at the signalized intersections, and a peak hour factor (PHF) of 0.92 was used. In addition, a CBD area type is used throughout the model as the study area is within the downtown area.

The traffic volumes applied to the existing conditions model are the volumes established in **Section 2.4**, based on the available TMC data. The heavy vehicle percentages from the available TMC data were also applied at each study intersection during the peak periods.

The signal timing plans identified in **Section 2.3** were incorporated into the model for the signalized study intersections, while stop control was applied in the model to the remaining study intersections.

The assessment of the study intersections is based on the "Highway Capacity Manual (HCM)" methodology, which prescribes a method for estimating the Level of Service (LOS), control delay, and volume-to-capacity of an intersection along with the approaches and movements of the intersection. HCM 2000 was for all intersections, except for all-way stop controlled (AWSC) intersections in which HCM 2010 was used. **Appendix E** contains the LOS definitions.

Finally, queuing was also analyzed using HCM 2000 and HCM 2010 methodology, in accordance with City of Mississauga's Transportation Impact Study Guidelines. HCM 2000 was used for all study intersections, except for the AWSC intersections which used HCM 2010.

2.6 Intersection Operations

Table 9 and **Table 10** outline the 2023 existing conditions traffic operations at the signalized and unsignalized study intersections, respectively. **Appendix F** contains the detailed capacity analysis worksheets.

Table 9: 2024 Existing Traffic Operations – Signalized Intersections

Intersection	Movement	LOS[1] A.M.	LOS[1] P.M.	Delay (s) A.M.	Delay (s) P.M.	v/c ratio[2] A.M.	v/c ratio[2] P.M.
Hurontario Street & John Street/Cooksville GO	**Overall**	**C**	**C**	**25**	**27**	**0.72**	**0.82**
	EBL	F	F	96	92	0.92	0.94
	EBTR	D	D	47	40	0.23	0.14
	WBL	D	D	44	39	0.03	0.07
	WBTR	D	D	45	41	0.17	0.21
	NBL	B	B	15	18	0.14	0.28
	NBTR	C	C	23	20	0.65	0.77
	SBL	B	D	19	45	0.52	0.70
	SBT	B	C	16	21	0.59	0.63
	SBR	B	B	13	16	0.33	0.19
Hurontario Street & Hillcrest Avenue/Kirwin Avenue	**Overall**	**C**	**C**	**28**	**33**	**0.72**	**0.77**
	EBL	F	D	123	47	1.05	0.69
	EBT	D	D	49	36	0.42	0.32
	EBR	D	C	44	32	0.10	0.07
	WBL	E	D	63	42	0.25	0.16
	WBTR	E	F	76	84	0.70	0.94
	NBL	B	C	17	28	0.30	0.58
	NBTR	C	C	21	33	0.51	0.60
	SBL	B	C	12	21	0.36	0.48
	SBT	B	B	14	17	0.68	0.70
	SBR	A	A	1	0	0.16	0.02
Dundas Street East & Kirwin Avenue/Camilla Road	**Overall**	**C**	**C**	**25**	**30**	**0.56**	**0.61**
	EBL	A	B	8	16	0.04	0.17
	EBT	B	B	13	18	0.48	0.42
	EBR	A	B	8	13	0.05	0.03
	WBL	B	B	11	10	0.23	0.27
	WBT	B	B	10	14	0.29	0.52
	WBR	A	B	9	11	0.10	0.25
	NBL	E	E	66	60	0.43	0.31
	NBTR	E	E	77	76	0.71	0.77
	SBL	F	F	88	138	0.89	1.06
	SBTR	D	D	50	49	0.29	0.29
Hillcrest Avenue & Cooksville GO	**Overall**	**A**	**B**	**8**	**12**	**0.33**	**0.25**
	EBLT	A	A	5	4	0.35	0.20
	WBTR	A	A	4	4	0.15	0.19
	SBL	C	C	25	27	0.09	0.38
	SBR	C	C	26	26	0.16	0.26

Note 1: The LOS of a signalized intersection is based on the average control delay per vehicle (HCM 2000).
Note 2: All intersection v/c ratios above 0.85 as well as movements above 1.0 are bolded with red text.

The signalized study intersections are generally operating efficiently under existing conditions, with moderate delays and reserve capacity to accommodate future traffic growth. A LOS "C" or better is estimated at the signalized study intersections during the weekday a.m. and p.m. peak hours.

The volumes used herein can be considered conservative as historic counts were used due to the impacts of ongoing construction along the Hurontario Street corridor. Due to the Hazel McCallion LRT construction, historic counts at some study intersections were grown to existing volumes, which may be considered conservative given that some of these areas have demonstrated low to negative traffic growth over the years.

Hurontario Street & John Street/Cooksville GO

At the signalized intersection of Hurontario Street & John Street/Cooksville GO, the intersection currently operates with a LOS "C" during both the weekday a.m. and p.m. peak hours. The intersection is also operating with an intersection control delay of 27 seconds or better and an intersection volume-to-capacity ratio of 0.82 or better. As such, the intersection is expected to operate efficiently with reserve capacity to accommodate future traffic growth.

Hurontario Street & Hillcrest Avenue/Kirwin Avenue

The Hurontario Street & Hillcrest Avenue/Kirwin Avenue is currently operating at a LOS "C" both peak hours. While the intersection is operating with moderate delays and volume-to-capacity ratios, the eastbound left-turn movement volume-to-capacity ratio of 1.05 during the weekday a.m. peak hour exceeds the City's critical threshold of 1.0.

Dundas Street East & Kirwin Avenue/Camilla Road

The signalized intersection of Dundas Street East & Kirwin Avenue/Camilla Road is operating efficiently during the weekday a.m. and p.m. peak hours. However, it is noted that the southbound left-turn movement currently experiences a critical volume-to-capacity of 1.06 during the weekday p.m. peak hour.

Hillcrest Avenue & Cooksville GO

The Hillcrest Avenue & Cooksville GO intersection is not currently expected to encounter notable operational issues, with a LOS "B" or better, intersection control delay of 12 seconds or better and an intersection volume-to-capacity ratio of 0.33 or better.

Table 10: 2024 Existing Traffic Operations – Unsignalized Intersections

Intersection (Control)	Performance Metrics						
	Movement	LOS		Delay (s)		Maximum v/c ratio[2]	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
John Street & Jaguar Valley Drive	**Overall[1]**	**B**	**B**	**11**	**11**	**0.09**	**0.11**
	EBTR	-	-	0	0	0.09	0.09
	WBLT	A	A	0	0	0.00	0.01
	NBLTR	B	B	11	11	0.07	0.11
Kirwin Avenue & Jaguar Valley Drive	**Overall[1]**	**A**	**B**	**9**	**11**	**0.24**	**0.44**
	EBL	A	A	9	10	0.02	0.05
	EBTR	A	A	9	10	0.24	0.29
	WBL	A	A	8	9	0.01	0.02
	WBTR	A	B	9	12	0.20	0.44
	NBLTR	A	A	8	9	0.06	0.16
	SBLTR	A	A	8	9	0.08	0.08
John Street & Little John Lane	**Overall[1]**	**A**	**B**	**10**	**10**	**0.16**	**0.18**
	EBTR	-	-	0	0	0.06	0.06
	WBLT	A	A	3	2	0.01	0.00
	NBLTR	A	B	10	10	0.16	0.18
Kirwin Avenue & Little John Lane	**Overall[1]**	**A**	**A**	**9**	**10**	**0.27**	**0.44**
	EBL	A	A	8	9	0.03	0.04
	EBT	A	A	10	10	0.27	0.25
	WBT	A	B	9	12	0.16	0.44
	WBR	A	A	8	8	0.15	0.20
	SBLR	A	A	9	9	0.15	0.11

Note 1: The overall LOS of a two-way stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000). The overall LOS of an AWSC intersection is based on the overall delay for the intersection (HCM 2010).

Under 2024 existing conditions, the unsignalized study intersections are operating efficiently with moderate delays and reserve capacity to accommodate future traffic growth. No notable operational constraints are expected under current conditions, with a LOS "B" or better and a maximum volume-to-capacity ratio of 0.44.

2.6.1 Queueing Analysis

As outlined in **Section 2.5**, Synchro was used to assess the queues within the study road network. The 95th percentile queues were compared against the available storage length to determine if any queues are expected to extend beyond the auxiliary turn lanes.

Table 11 outlines the results of the 2024 existing conditions queuing assessment.

Table 11: 2024 Existing Queuing Assessment

Intersection	Performance Metrics			
	Movement	95th Percentile Queue Length (m)		Auxiliary Lane Storage Length (m)
		A.M.	P.M.	
Hurontario Street & John Street/Cooksville GO	EBL	93	117	200[1]
	WBL	6	12	25
	NBL	6	7	15
	SBL	25	45	35
	SBR	43	26	40
Hurontario Street & Hillcrest Avenue/Kirwin Avenue	EBL	128	44	185[2]
	WBL	20	21	50
	NBL	10	24	60
	SBL	12	15	55
Dundas Street East & Kirwin Avenue/Camilla Road	EBL	6	14	15
	EBR	8	3	30
	WBL	17	20	30
	WBR	8	14	65
	NBL	34	29	36
	SBL	82	96	40
Hillcrest Avenue & Cooksville GO	No Auxiliary Turn Lanes	-	-	-
John Street & Jaguar Valley Drive	No Auxiliary Turn Lanes	-	-	-
Kirwin Avenue & Jaguar Valley Drive[3]	EBL	0	0	20
	WBL	0	0	15
John Street & Little John Lane	No Auxiliary Turn Lanes	-	-	-
Kirwin Avenue & Little John Lane[3]	EBL	0	0	10
	WBR	1	1	50

Note 1: Based on distance to upstream intersection.
Note 2: Two-way left-turn lane storage.
Note 3: Queuing results for the AWSC intersections based on HCM 2010 methodology.

<u>Hurontario Street & John Street/Cooksville GO</u>

Queuing exceedances for the southbound right-turn and southbound left-turn movements at the intersection of Hurontario Street & John Street/Cooksville GO were estimated during the weekday a.m. and p.m. peak hours, respectively. These queuing exceedances of 10 metres or less, which is less than two vehicles, are not generally associated with notable operational concerns. Furthermore, these queue exceedances can be accommodated within the provided storage and taper length.

<u>Dundas Street East & Kirwin Avenue/Camilla Road</u>

A queuing exceedance of 45 metres beyond the delineated storage is projected to occur for the southbound left-turn lane at Dundas Street East & Kirwin Avenue/Camilla Road. While the expected southbound left-turn lane queue of 95 metres at Dundas Street East & Kirwin Avenue is expected to extend beyond the provided storage length, the queue can be accommodated within the provided taper, given the painted median available. Furthermore, even though this movement is operating near capacity, it is generally expected that the associated protected left-turn phase will clear queues every cycle sufficiently to avoid creating demand starvation problems for the southbound approach.

3.0 Future Background Conditions

This section summarizes the future background conditions of the study road network and provides details relating to growth rates, future transportation network improvements, and background developments within the study area. As outlined in **Section 1.3**, this study considers the 2029 horizon year in the future background traffic analysis. The results of which are summarized herein in **Section 3.7**.

3.1 Future Transportation Planning Policy Context

To ensure that the development proposal is in general conformance with, and supports the transportation planning policy context, a review of the relevant transportation policy documents was undertaken as part of the preparation of this study. This section summarizes the key findings from this review, with each relevant policy and/or plan being discussed individually in the subsequent sections.

The following policies and documents were reviewed:

- MTO Transit Supportive Guidelines
- Official Plan Amendment No. 144 – Protected Major Transit Station Areas
- Metrolinx 2041 – Regional Transportation Master Plan

3.1.1 MTO Transit Supportive Guidelines

The Ontario Ministry of Transportation's (MTO) Transit Supportive Guidelines (2012) is a policy document which outlines best practices for transit-friendly land use planning, urban design, and transportation operations. The intent of the document is to provide guidance on creating a pattern of development that is supportive of public transit to increase transit ridership and facilitate the establishment of new transit systems. The guidelines are built on the foundation of transit as an opportunity to adapt to changing demographics while building healthier communities. Policy identified in MTO's Transit Supportive Guidelines can broadly be summarized as the following:

- Integrating transportation and land use considerations at all stages of the planning process.
- An emphasis on intensification and creation of a more compact urban form.
- Promoting land use patterns, densities and mix of uses that minimize the length and number of vehicles trips and support transit as a viable mode choice.

The transit supportive guidelines help to better utilize existing infrastructure, grow ridership, and manage urban growth in a more transit-supportive manner. Included with the guidelines are transit supportive principles to promote development patterns that make transit less expensive and more convenient. Emphasis is placed on a multi-modal transit strategy to help facilitate a shift in modal split.

MTO's transit supportive goals related to developments are to provide and facilitate:

- The layout of local street and block patterns.

- The creation of complete streets.
- Improved access to transit services.
- The creation of a transit supportive urban form.

Parking management to permit reduction in maximum and minimum parking requirements once transportation demand management measures are adopted. The transit supportive goals are met within the development application and the overall plans for the future redevelopment of the study area as a transit oriented community (TOC). This is achieved in the Subject Development through the creation of complete streets that accommodate all modes of transportation, improved access to higher-order transit along the Hazel McCallion LRT corridor and Cooksville GO station, and a transit-supportive urban form with supporting transportation demand management (TDM) strategies.

3.1.2 Cooksville GO Protected Major Transit Station Area

The Provincial Growth Plan (Government of Ontario, 2020) defines major transit station areas (MTSAs) as areas within 500 to 800 metres of a transit station, the area within which is intended to represent an approximate 10-minute walk. MTSAs will be required to have minimum levels of density, with thresholds varying depending on the type of transit station (GO rail, LRT, subways etc.). These policies are aimed at providing transit supportive densities which underpin transit investments but also guide sustainable development by ensuring that growth is prioritized in the area of transit nodes.

From a transportation perspective, these policies aim to have higher proportions of persons living and working around higher-order transit nodes, which contribute to higher levels of sustainable mode share and deprioritizing the automobile. New developments within these MTSAs are therefore envisioned to be Transit Oriented Developments (TOD), which when supplemented by robust transportation demand management strategies result in reduced automobile use, leading to more efficient use of the multimodal transportation network by new developments.

The Development Lands are located within the Cooksville GO protected major transit station area (PMTSA), as outlined in Official Plan Amendment (OPA) No. 144, with the Subject Development approximately 550 metres from the existing Cooksville GO station.

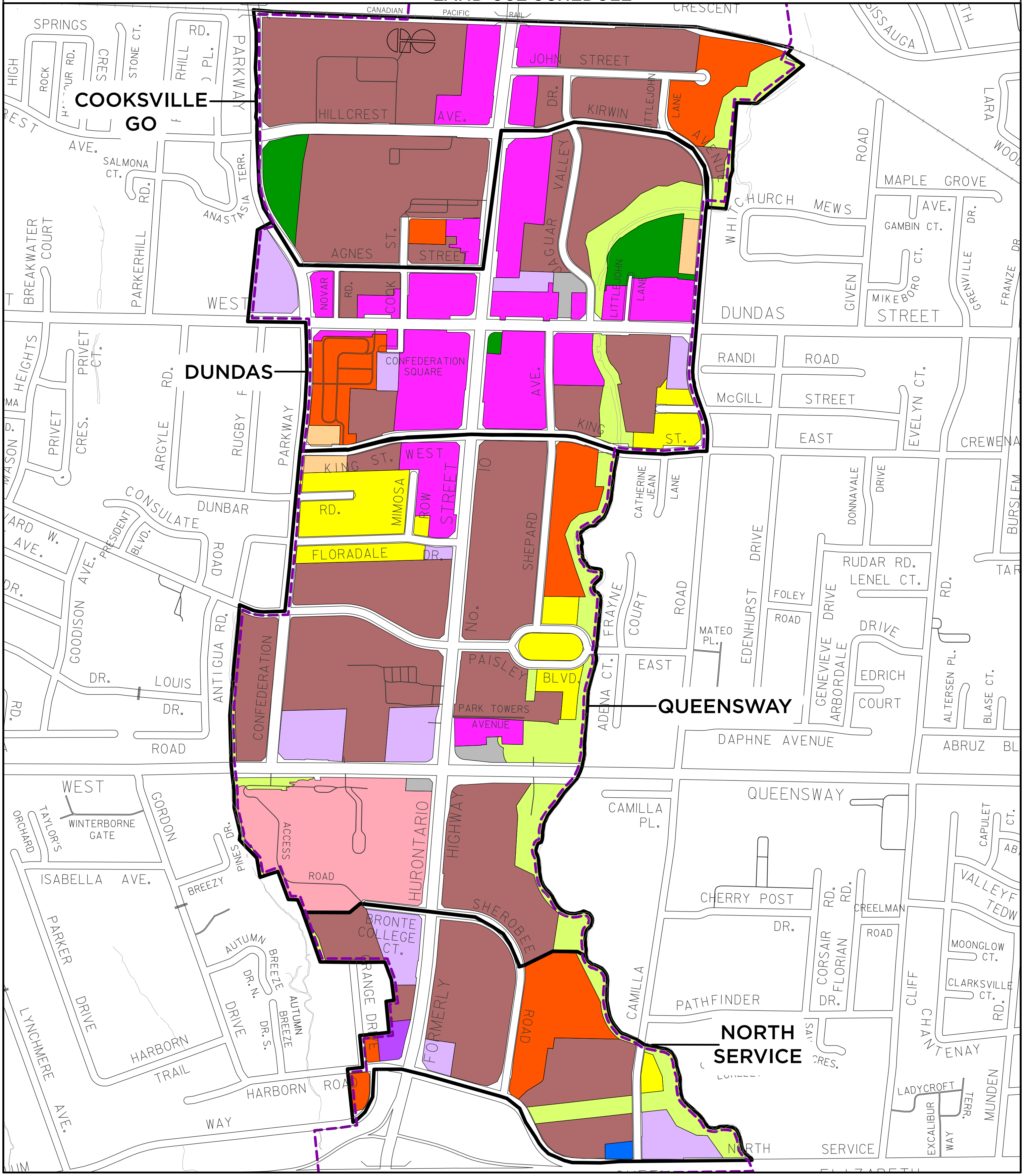
With the Subject Site being located within a PMTSA, it is expected that redevelopment will follow transit oriented principles, prioritize transportation demand management, provide transit-supportive densities, and support a multimodal mobility framework from a "complete streets" perspective. Access to the higher-order transit station will support the complete mobility goals of the redeveloped area.

Figure 5 outlines the Cooksville GO PMTSA.

PROTECTED MAJOR TRANSIT STATION AREA (PMTSA)

SCHEDULE 11m (HURONTARIO LRT - COOKSVILLE GO, DUNDAS, QUEENSWAY, NORTH SERVICE)

LAND USE SCHEDULE



- PMTSA Boundary (Land Use Map)
- Convenience Commercial
- Greenlands
- Residential High Density
- Institutional
- Residential Low Density I
- Residential Low Density II
- Residential Medium Density
- Mixed Use
- Motor Vehicle Commercial
- Office
- Public Open Space
- Utility
- City Structure - Downtown

MAP 'C13'

MISSISSAUGA

Produced by Geospatial Solutions

3.1.3 Metrolinx 2041 Regional Transportation Plan

The 2041 Regional Transportation Plan (RTP) (Metrolinx, 2018) is the primary long-range, regional transportation planning policy document from the Government of Ontario for the Greater Toronto and Hamilton Area. Completed in 2018, the plan is the second RTP undertaken by Metrolinx and builds off prior work in the original Big Move RTP (2008). The 2041 RTP outlines policy and project priorities for the provincial agency to pursue. The overarching goals that form the basis of the strategies and priorities of the plan are as follows:

- Strong connections – Connecting people to the places that make their lives better, such as homes, jobs, community services, parks and open spaces, recreation, and cultural activities.

- Complete travel experiences – Designing an easy, safe, accessible, affordable, and comfortable door-to-door travel experience that meets the diverse needs of travellers.

- Sustainable and healthy communities – Investing in transportation for today and for future generations by supporting land use intensification, climate resiliency and a low-carbon footprint, while leveraging innovation.

The goals of the 2041 RTP outlined above will be achieved through their strategies and corresponding priority actions. The five strategies described in the 2041 RTP are outlined below:

- Complete the delivery of current regional transit projects.
- Connect more of the region with frequent rapid transit.
- Optimize the transportation system.
- Integrate transportation and land use.
- Prepare for an uncertain future.

As part of the priority actions outlined in the 2041 RTP, implementation of a frequent rapid transit network and regional cycling network were recommended for implementation by the 2041 horizon. This includes several routes relevant to the subject which are either in development or proposed as part of this plan. The specific routes that are near the Subject Site and are pertinent to this study are identified as part of the of the future transportation network in **Section 3.2**.

3.2 Future Transportation Network

The following improvements to the transportation network are planned within the study area:

- Hazel McCallion LRT
- Dundas Bus Rapid Transit (BRT)
- GO Transit Expansion
- Hurontario Street and Dundas Street Cycle Tracks

Appendix G includes the relevant future improvement excerpts.

3.2.1 Hazel McCallion Light Rail Transit

The Hazel McCallion LRT, previously known as the Hurontario LRT, is proposed along Hurontario Street between the Brampton Gateway Terminal and the Port Credit GO Station. In total, 19 stops are proposed along an 18-kilometre stretch of Hurontario Street throughout the City of Mississauga and City of Brampton.

The Hazel McCallion LRT will operate at-grade within a dedicated transit lane. As such, one of the travel lanes along Hurontario Street will be converted to a dedicated transit lane. Two travel lanes plus turning lanes will be maintained along Hurontario Street for public use following the build out of the Hazel McCallion LRT. As such, a lane reduction from three to two travel lanes along Hurontario Street is planned within in the study area.

Construction associated with the Hazel McCallion LRT is still ongoing at the time of writing. However, it is understood that substantial completion in 2024 remains unchanged. As such, it is assumed that the Hazel McCallion LRT will be operational prior to the 2029 horizon year.

Figure 6: Hazel McCallion LRT Proposed Route (Metrolinx)

3.2.2 Dundas Bus Rapid Transit

The proposed Dundas BRT is planned to provide service along a 48-kilometre corridor along Dundas Street between Highway 6, in the City of Hamilton, and the Kipling Transit Hub, in the City of Toronto. The Dundas BRT will span between the City of Hamilton and City of Toronto, as well as connecting the Region of Peel and Region of Halton.

It is understood that construction of the Dundas BRT is planned to start in 2026. As such, it is assumed that the Dundas BRT will be operational beyond the 2029 horizon year. Although the completion of the Dundas BRT is proposed outside of the study horizon, it is important to note the site's proximal location from a future BRT line, in addition to other higher-order transit, is indicative of the future TOC context for the Cooksville area.

Figure 7 outlines the Dundas BRT's proposed alignment.

Figure 7: Dundas BRT Proposed Alignment (Metrolinx)

3.2.3 GO Transit Expansion

Metrolinx's GO Expansion program will provide the following improvements across the GTHA:

- More All-Day Service
- Services in Both Directions
- 15-minute Headways (or better)
- Faster & More Efficient Fleet
- More Accessible Stations
- Union Station Expansion

As part of this program, improvements are planned for the Milton GO line, which include the connections to three (3) transit hubs, 15-minute headways during rush hour and 30% more trips. Furthermore, the two-way all-day GO network will be expanded to include the Milton GO line. Following these improvements, the Milton GO line and other GO line will provide improved reliability and transit capacity in the study area.

It is understood that these improvements are planned to be implemented by 2041.

3.2.4 Hurontario Street and Dundas Street Cycle Tracks

The City of Mississauga's Cycling Master Plan (June 2018) proposes cycle tracks on both sides of Hurontario Street, north of the Queen Elizabeth Way (QEW) and a multi-use trail, south of the

QEW. These cycling facilities will be implemented as part of the Hazel McCallion LRT works and thus is expected to be built out prior to 2029, consistent with the Hazel McCallion LRT. The cycle tracks, located within the study area, will be raised and separated from vehicular traffic.

The Dundas Connects Master Plan (City of Mississauga, May 2018) recommends a protected cycle track on both sides of Dundas Street in conjunction with the Dundas BRT. The City of Mississauga's Cycling Master Plan does not identify the cycle track as part of the five-year implementation plan. Moreover, as the Dundas BRT is assumed to be built out beyond the 2029 horizon year, the same timeline is assumed for the Dundas Street cycle tracks.

3.2.5 Summary

Table 12 summarizes the future roadway improvements in the study area.

Table 12: Planned Roadway Improvements in Study Area

Improvement	Segment	Estimated Horizon	Source
Hazel McCallion LRT	Hurontario Street (Brampton Gateway Terminal to Port Credit GO Station)	Before 2029	Metrolinx. City of Mississauga
Hurontario Street Cycle Tracks & Multi-Use Trail[1]	Hurontario Street (Steeles Ave to Lake Shore Blvd)	Before 2029	Metrolinx
Dundas BRT	Dundas Street (Highway 6 to Kipling Transit Hub)	Beyond 2029	Metrolinx, City of Mississauga
GO Expansion	n/a[2]	Beyond 2029	Metrolinx
Dundas Street Cycle Tracks[3]	Dundas Street (West City Boundary to East City Boundary)	Beyond 2029	City of Mississauga

Note 1: Implemented as part of the Hazel McCallion LRT works.
Note 2: GO Expansion is planned throughout the GO Transit network, including the Milton GO Line which stops within the study area.
Note 3: Assumed to be implemented as part of the Dundas BRT works.

Traffic demand impacts due to the lane reduction associated with the Hazel McCallion LRT was incorporated into the future traffic volume forecast, as these improvements are accounted for in the growth rates used. Refer to **Section 3.4** for the relevant discussion on growth rates.

3.3 Future Transportation Trends

The existing mode split for inbound and outbound trips during the weekday a.m. and p.m. peak hours was determined based on the 2016 Transportation Tomorrow Survey (TTS) data. TTS queries were stratified for the immediate study area (2006 GTA Zone 3862). **Appendix J** includes the data from the TTS queries.

An adjustment to the existing mode split was made to determine the future mode split within the study area, as no future mode split following the Hazel McCallion LRT build out was available at the time of writing (February 2024). Per the Hurontario LRT Benefits Case Analysis (Steer Davies Gleave, March 2016), an increase of 25% in transit mode share is expected due to the Hazel McCallion LRT. It is assumed that the 25% transit mode share increase is due to a 25% reduction in auto mode share. **Appendix G** includes the relevant excerpts form the Hurontario LRT Benefits Case Analysis.

Table 13 summarizes the existing and expected future mode split.

Table 13: Existing and Expected Future Mode Split

Travel Mode	Existing Mode Split	Expected Future Mode Split[1]
Auto	78%	53%
Transit	17%	42%
Walking	4%	4%
Cycling	1%	1%
Total	**100%**	**100%**

Note 1: Based on existing mode split and the increase in transit mode share due to the Hazel McCallion LRT as outlined in the Hurontario LRT Benefits Case Analysis.

3.4 Growth Rates

The growth rates were determined in coordination with City of Mississauga staff based on the City's growth models. **Appendix B** includes the relevant correspondence with City staff. **Table 14** outlines the growth rates for the arterial and collector roadways.

Table 14: Arterial and Collector Growth Rates

Corridor	Direction	2024 to 2026[1]		2026 to 2029[1]	
		A.M.	P.M.	A.M.	P.M.
Hurontario Street	Northbound	-20.5% (total)	-20.5% (total)	1.0%	0.5%
	Southbound	-23.5% (total)	-17.5% (total)	0.5%	0.5%
Dundas Street East	Eastbound	0.0%	0.5%	0.0%	0.0%
	Westbound	1.0%	0.0%	0.0%	0.0%
Kirwin Avenue/ Hillcrest Avenue	Eastbound	0.5%	0.5%	0.0%	0.5%
	Westbound	0.5%	0.5%	0.5%	0.0%
Kirwin Avenue/ Camilla Road	Northbound	0.5%	0.5%	0.5%	0.0%
	Southbound	0.5%	0.5%	0.0%	0.5%

Note 1: Growth per annum, unless otherwise noted.

It is noted that the negative growth provided for Hurontario Street from 2024 to 2026 is a one-time adjustment to account for the Hazel McCallion LRT, which includes lane reductions and changes in mode splits along the Hurontario Street corridor.

No growth rates were applied on the following local streets, as confirmed with City of Mississauga staff:

- John Street
- Jaguar Valley Drive
- Little John Lane

These roads carry local accesses only and the only future growth expected would be through redevelopment.

Appendix B includes the correspondence with City staff.

3.5 Background Developments

In addition to the annual compounded growth rate, background site generated traffic from all background developments within a 1-kilometre radius was also separately applied to the future background traffic volumes, as discussed in the Terms of Reference with City of Mississauga staff.

Table 15 outlines the proposed developments noted near the Subject Site and included as a background development in the future analyses.

Table 15: Background Developments Breakdown

No.	Background Development	Land Use	Statistic
1	0 King Street East, 0 & 2487 Camilla Road	Residential	24 units
2	25 & 33 Hillcrest Avenue, 3146, 3154 & 3168 Hurontario Street	Residential	2,224 units
		Retail	6,270 m^2
		Office	8,692 m^2
		Community	6,216 m^2
3	60 Dundas Street East	Residential	1,224 units
		Daycare	847 m^2
4	65-71 Agnes Street	Residential	385 units
5	3016, 3020, 3026 & 3032 Kirwin Avenue, 3031 Little John Lane	Residential	148 units
6	3085 Hurontario Street	Residential	1,658 units
		Retail	1,160 m^2
7	3115 Hurontario Street	Residential	431 units
		Retail	217 m^2
8	3420 & 3442 Hurontario Street	Residential	683 units
		Retail	2,906 m^2
9	3065 Jaguar Valley Drive	Residential	n/a

Figure 8 illustrates the location of the background developments listed above.

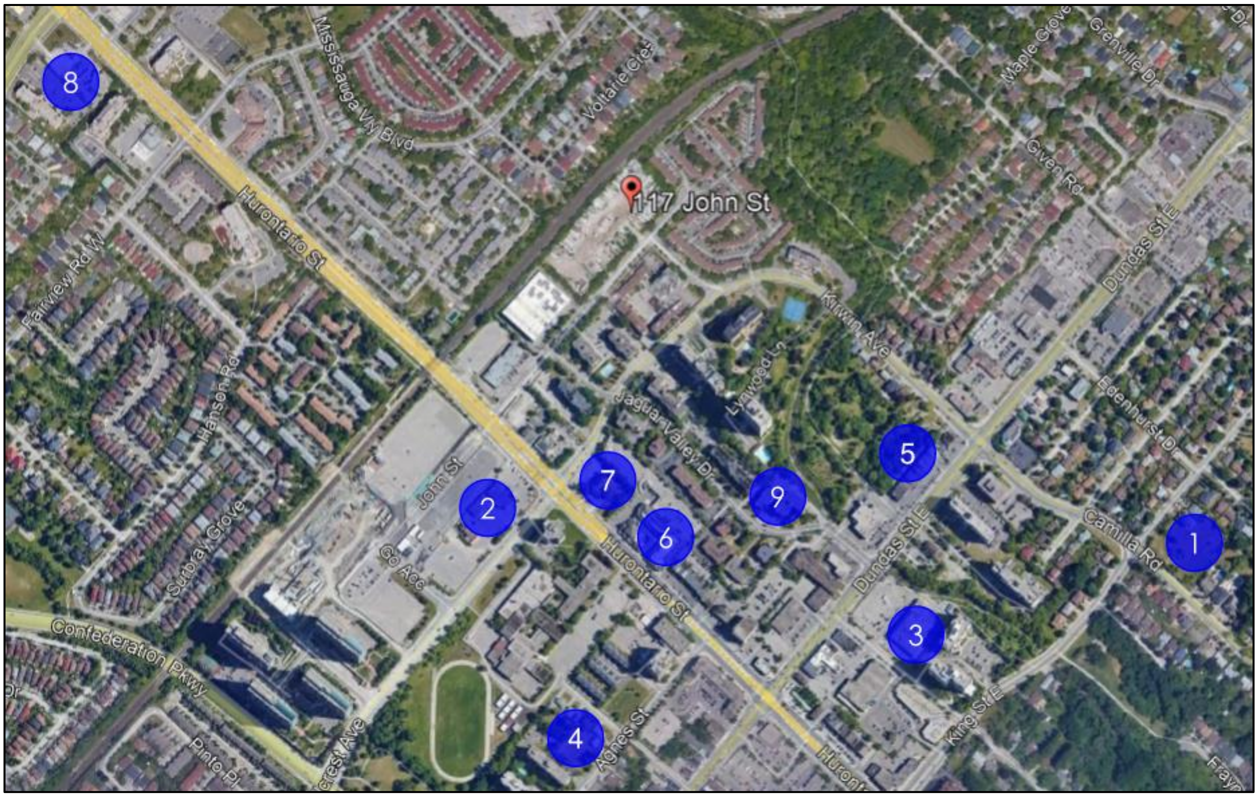


Figure 8: Background Developments Map

<u>0 King Street East, 0 & 2487 Camilla Road</u>

The 0 Kings Street East, 0 & 2487 Camilla Road background development proposes a residential development with 24 units. The site generated traffic was retrieved from the Transportation Impact Study Update (Nextrans, July 2022).

The development is expected to generate a total of 22 and 26 two-way trips during the weekday a.m. and p.m. peak periods, respectively. These trips were assigned to the boundary road network based on existing travel patterns.

It is noted that Nextrans's report did not assign trips north of King Street East. As such, trips to/from the north at Hurontario Street & King Street East are assumed to continue travelling along Hurontario Street. Moreover, trips to/from the north at King Street East & Camilla Road are assumed to travel to/from the east along Dundas Street East.

<u>25 & 33 Hillcrest Avenue, 3146, 3154 & 3168 Hurontario Street</u>

The 25 & 33 Hillcrest Avenue, 3146, 3154 & 3168 Hurontario Street background development proposes a mixed-use development consisting of five buildings with a total of 2,224 residential units, 6,270 m^2 retail, 8,692 m^2 office, and 6,216 m^2 community space. The site generated traffic was retrieved from the Urban Transportation Considerations (BA Group, May 2022).

The development is expected to generate a net total of 565 and 370 two-way trips during the weekday a.m. and p.m. peak periods, respectively. As outlined in BA Group's report, these trips were assigned to the boundary road network based on existing travel patterns.

As BA Group's report did not assign trips east of Hurontario Street, all trips to/from the east at Dundas Street & Hurontario Street are assumed to continue travelling along Dundas Street East.

60 Dundas Street East

The 60 Dundas Street East background development proposes a mixed-use residential and commercial development, with 1,224 residential units and 847 m^2 of ground floor retail space. The site generated traffic was retrieved from the Transportation Study (R.J. Burnside, March 2022).

It is expected to generate a total of 323 and 387 two-way trips during the weekday a.m. and p.m. peak periods, respectively. These trips were assigned to the boundary road network based on existing travel patterns.

It is noted that the trips were not assigned north of Dundas Street. For trips to/from the north at Dundas Street & Hurontario Street, the trips are assumed to continue travelling north along Hurontario Street. For trips to/from the north at Dundas Street East & Jaguar Valley Drive, the trips are assumed to continue travelling north along Jaguar Valley Drive, before travelling along John Street and Hurontario Street.

65-71 Agnes Street

The 65-71 Agnes Street development proposes a residential development, with 379 residential condominium units and 6 residential townhouse units. The site generated traffic was retrieved from the Traffic Impact Study (UrbanTrans, April 2022).

Per the UrbanTrans report, the development is expected to generate 90 and 105 two-way trips during the weekday a.m. and p.m. peak periods, respectively. These trips were assigned to the boundary road network based on existing travel patterns.

It is noted that the trips were not assigned north of Agnes Street and east of Hurontario Street. It is assumed all trips to/from the north will continue travelling along Hurontario Street and all trips to/from the east will continue travelling along Dundas Street.

3016, 3020, 3026 & 3032 Kirwin Avenue, 3031 Little John Lane

3016, 3020, 3026 & 3032 Kirwin Avenue, 3031 Little John Lane: Located south of the Subject Property, proposes a residential development, with 148 residential apartment units. The site generated traffic was retrieved from the Transportation Impact Study Update (LEA, December 2022).

Per LEA's report, the development is expected to generate 54 and 59 two-way trips during the weekday a.m. and p.m. peak periods, respectively. These trips were assigned to the boundary road network based on existing travel patterns.

It is noted that the trips were not assigned north or west of Dundas Street & Kirwin Avenue/Camilla Road. The trips to/from the north were assumed to continue along Kirwin Avenue. These trips were then distributed along Hillcrest Avenue and Hurontario Street based on the existing traffic volumes.

3085 Hurontario Street

The 3085 Hurontario Street development proposes a mixed-use development, with 1,658 residential units and 1,160 m^2 of retail space. The site generated traffic was retrieved from the Urban Transportation Considerations (BA Group, September 2023).

As outlined in the BA Group report, the development is expected to generate 365 and 205 two-way trips during the weekday a.m. and p.m. peak periods, respectively. These trips were assigned to the boundary road network based on existing travel patterns.

3115 Hurontario Street

The 3115 Hurontario Street development proposes a mixed-use development, with 431 residential units and 217 m^2 of ground floor retail. The site generated traffic was retrieved from the Transportation Impact Study (Nextrans, September 2022).

Per the Nextrans report, the development is expected to generate 100 and 120 two-way trips during the weekday a.m. and p.m. peak periods, respectively. These trips were assigned to the boundary road network based on existing travel patterns.

It is noted that the Nextrans report did not distribute trips south of Hurontario Street & Hillcrest Avenue/Kirwin Avenue. Trips to and from the north were assumed to continue travelling along Hurontario Street. Trips to and from the south were distributed to Hurontario Street and Dundas Street based on the existing traffic volumes.

3420 & 3442 Hurontario Street

3420 & 3442 Hurontario Street: Located northwest of the Subject Property, proposes a mixed-use development, with 683 residential units and 2,906 m^2 of retail area. The site generated traffic was retrieved from the Traffic Impact Study Update (Crozier, December 2022).

The development is expected to generate 185 and 230 two-way trips during the weekday a.m. and p.m. peak periods, respectively. These trips were assigned to the boundary road network based on existing travel patterns.

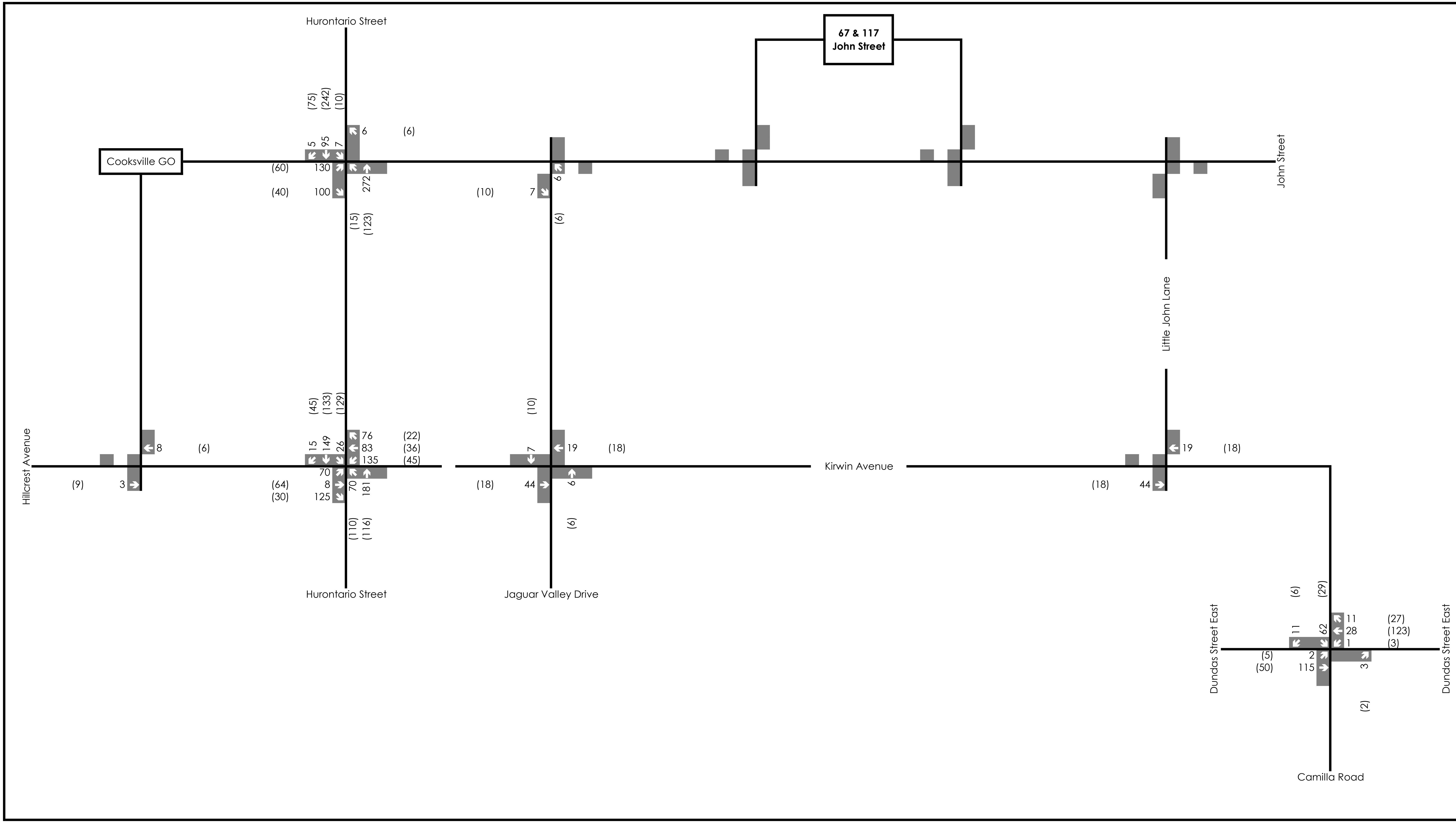
It is noted that the trips were not distributed east of Jaguar Valley Drive. Trips to/from the east at Hurontario Street & Dundas Street were assumed to continue travelling along Dundas Street East. Trips to/from the east at Kirwin Avenue & Jaguar Valley Drive were assumed to continue travelling along Kirwin Avenue before travelling along Dundas Street East.

3065 Jaguar Valley Drive

The 3065 Jaguar Valley Drive development proposes converting an existing apartment building to a standard condominium. Per discussions with City staff, the site was not included as a background development as there are no changes in the operation of the development are expected.

Summary

Appendix H contains the relevant background development excerpts. **Figure 9** illustrates the background development traffic volumes.



Legend

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

69 & 117 John Street

Background Development Volumes

CROZIER CONSULTING ENGINEERS

Figure 9

Project No. 2378-6557
Date. 2024.09.17
Analyst. MY

3.6 Traffic Modelling and Assumptions

For traffic modelling purposes, signal timing plans by default were kept consistent with existing conditions, unless other considerations necessitated adjustments. Due to the Hazel McCallion LRT, the signal timing plans for study intersections along Hurontario Street were adjusted for future conditions, considering that left-turns along the corridor would occur via protected left-turn phases only. Accordingly, protected northbound and southbound left-turn phases were implemented at Hurontario Street & John Street/Cooksville GO and Hurontario Street & Hillcrest Avenue/Kirwin Avenue. Both intersections were also optimized.

The future lane configurations and auxiliary turn lane storage lengths along the Hurontario Street corridor were reviewed to understand the future design outlined in the Hazel McCallion LRT Rollout Map (June 2017), received from City staff. **Figure 10** illustrates the Hazel McCallion LRT design within the study area.

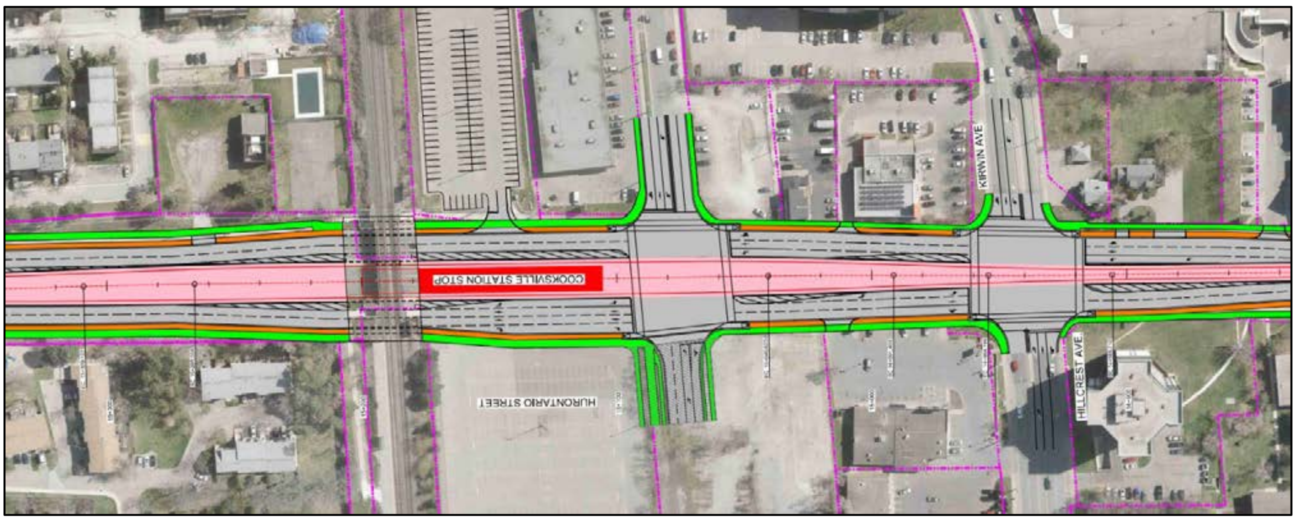


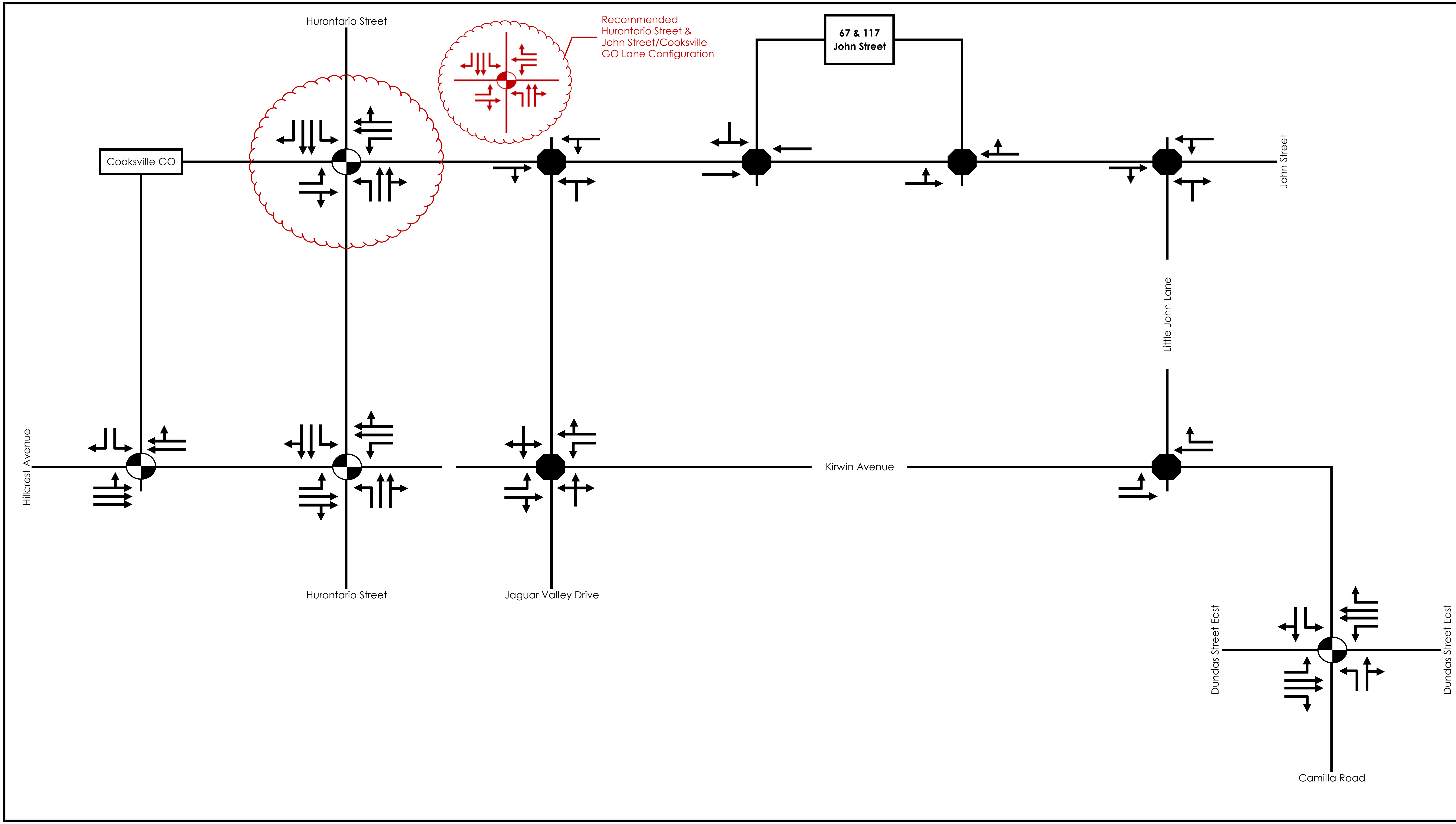
Figure 10: Hazel McCallion LRT Design (Metrolinx, February 2017)

The intersection of Hurontario Street & John Street/Cooksville GO was initially modelled per the lane configurations in **Figure 10**. However, initial modelling assuming the westbound lane configuration (exclusive left-turn, exclusive through and shared through-right), per **Figure 10** indicated delay and capacity issues were projected at this intersection. Consequently, an alternative configuration with exclusive left-turn, through, and right-turn lanes for the east approach was also reviewed herein. This configuration results in improved operations due to the high number of westbound right-turn movements compared to relatively low through traffic volumes. However, it is recognized that the Hazel McCallion LRT Design configuration may also function adequately in future conditions, particularly if the projected automobile traffic growth does not materialize as expected given the use of historic data for Hurontario volumes.

Therefore, both the planned shared westbound through-right-turn configuration as well as an exclusive westbound right-turn lane configuration were assessed for future background and future total conditions analysis herein for the purposes of traffic modelling.

PHFs of 0.92 and lost time adjustments of -1.0 were kept consistent with existing operations.

Appendix G contains the relevant future improvement excerpts. **Figure 11** outlines the planned future study road network.



Legend

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

69 & 117 John Street

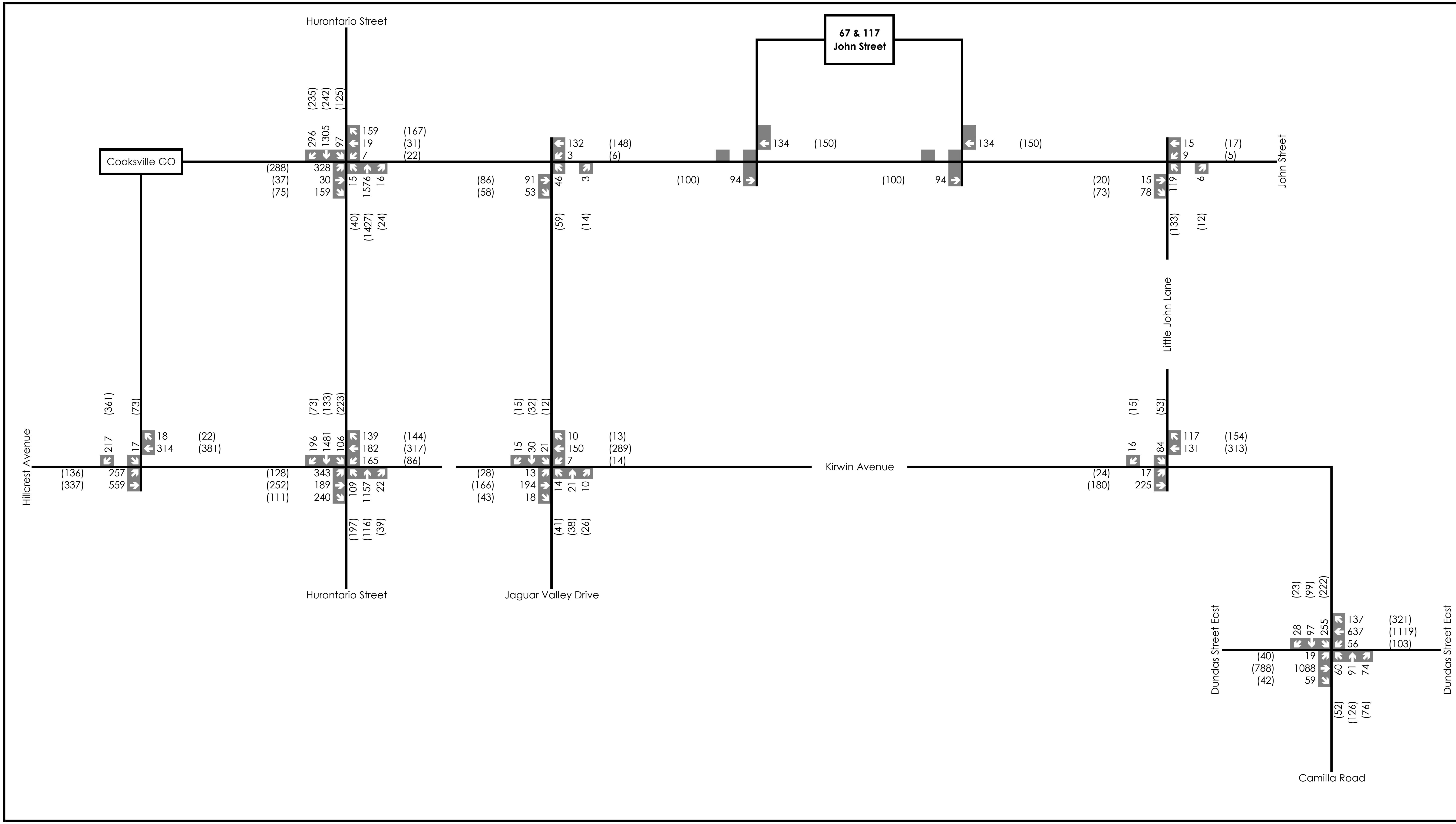
Planned Future Study Road Network

CROZIER
CONSULTING ENGINEERS

Figure 11
Project No. 2378-6557
Date. 2024.09.17
Analyst. MY

3.7 Intersection Operations

Figure 12 illustrates the 2029 future background traffic volumes. **Table 16** and **Table 17** outlines the 2029 future background traffic operations for signalized and unsignalized study intersections, respectively. **Appendix F** contains the detailed capacity analysis worksheets.



Legend

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

69 & 117 John Street

2029 Future Background Traffic Volumes

CROZIER CONSULTING ENGINEERS

Figure 12

Project No. 2378-6557
Date. 2024.09.17
Analyst. MY

Table 16: 2029 Future Background Traffic Operations – Signalized Intersections

Intersection		Movement	LOS[1] A.M.	LOS[1] P.M.	Delay (s) A.M.	Delay (s) P.M.	v/c ratio[2] A.M.	v/c ratio[2] P.M.
Hurontario Street & John Street/Cooksville GO	Shared WBTR Lane	**Overall**	**F**	**E**	**82**	**61**	**1.08**	**0.98**
		EBL	F	F	101	108	1.01	1.01
		EBTR	D	D	37	41	0.29	0.17
		WBL	C	D	34	40	0.02	0.08
		WBTR	D	D	35	40	0.14	0.11
		NBL	F	E	87	78	0.57	0.49
		NBTR	F	E	126	68	1.17	1.02
		SBL	F	F	133	85	0.92	0.76
		SBT	D	B	46	19	0.92	0.16
		SBR	C	B	25	20	0.41	0.21
	Exclusive WBR Lane	**Overall**	**E**	**D**	**57**	**47**	**1.03**	**0.93**
		EBL	F	F	126	111	1.07	1.00
		EBTR	D	D	46	47	0.35	0.20
		WBL	D	D	41	45	0.03	0.09
		WBT	D	D	41	45	0.04	0.08
		WBR	D	D	44	46	0.23	0.13
		NBL	F	E	87	74	0.57	0.49
		NBTR	E	D	72	35	1.05	0.93
		SBL	F	F	98	69	0.79	0.74
		SBT	C	B	30	15	0.82	0.15
		SBR	B	B	18	15	0.36	0.21
Hurontario Street & Hillcrest Avenue/Kirwin Avenue		**Overall**	**F**	**E**	**123**	**58**	**1.12**	**0.46**
		EBL	F	E	201	63	1.28	0.75
		EBTR	D	D	41	48	0.40	0.43
		WBL	F	E	97	64	0.91	0.61
		WBTR	D	E	47	68	0.34	0.78
		NBL	F	E	100	79	0.82	0.80
		NBTR	D	C	48	27	0.89	0.12
		SBL	E	F	78	86	0.82	0.81
		SBTR	F	C	203	21	1.30	0.14

Intersection		Movement	LOS[1]		Delay (s)		v/c ratio[2]	
			A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Dundas Street East & Kirwin Avenue/Camilla Road	Existing Signal	**Overall**	**D**	**C**	**36**	**34**	**0.64**	**0.65**
		EBL	A	B	9	17	0.06	0.21
		EBT	B	B	14	18	0.55	0.45
		EBR	A	B	9	13	0.05	0.04
		WBL	B	B	13	11	0.28	0.29
		WBT	B	B	11	14	0.33	0.56
		WBR	A	B	9	11	0.11	0.28
		NBL	E	E	65	60	0.43	0.31
		NBTR	E	E	77	76	0.72	0.77
		SBL	F	F	175	191	1.18	1.21
		SBTR	D	D	50	50	0.32	0.31
	Signal Optimized #1	**Overall**	**C**	**C**	**29**	**30**	**0.67**	**0.68**
		EBL	B	C	14	26	0.07	0.27
		EBT	C	C	23	26	0.63	0.52
		EBR	B	B	14	19	0.06	0.04
		WBL	C	B	23	16	0.36	0.34
		WBT	B	C	17	22	0.38	0.63
		WBR	B	B	14	17	0.11	0.31
		NBL	E	E	65	60	0.43	0.31
		NBTR	E	E	77	76	0.73	0.77
		SBL	D	D	54	52	0.77	0.74
		SBTR	D	D	39	39	0.24	0.23
Hillcrest Avenue & Cooksville GO		**Overall**	**A**	**B**	**8**	**12**	**0.34**	**0.26**
		EBLT	A	A	5	4	0.35	0.21
		WBTR	A	A	4	4	0.16	0.19
		SBL	C	C	25	27	0.09	0.37
		SBR	C	C	26	26	0.16	0.26

Note 1: The LOS of a signalized intersection is based on the average control delay per vehicle (HCM 2000).
Note 2: All intersection v/c ratios above 0.85 as well as movements above 1.0 are bolded with red text.

At the study intersections along Hurontario Street significant operational performance loss is projected by the traffic model, with a drop in LOS from “C” to “E” or “F” being projected with at or slightly beyond capacity conditions.

The implementation of the Hazel McCallion LRT will result in higher delays due to the vehicle travel lane reductions along the Hurontario Street corridor as well as the implementation of northbound and southbound protected left-turn movements. These operations are not uncommon for transit corridors with required protected left-turn phases, such as the Highway 7 BRT and St. Clair Avenue. Some congestion is expected along transit corridors such as along the Hazel McCallion LRT, as the priority is to provide higher-order transit service that transport people in a more efficient manner than the traditional automobile. As outlined in MTO’s Transit Supportive Guidelines, congestion can motivate commuters to shift from automobile to sustainable modes and the negative impact to vehicle operations due to the implementation of higher-order transit, such as the Hazel McCallion LRT, is an acceptable trade-off.

Furthermore, the volumes used herein can be considered conservative as historic counts were used and may not fully account for the modal split impacts of the Hazel McCallion LRT as well as new routes being available on the boundary road network being available through redevelopment (e.g., Hurontario Street & John Street/Cooksville GO). Due to the Hazel McCallion LRT construction, historic counts at some study intersections (e.g., Hurontario Street & Hillcrest Avenue/Kirwin Avenue) were grown to estimate "existing volumes". While a one-time negative growth factor was applied along Hurontario Street, there may be additional impacts of the Hazel McCallion LRT to the future mode split within the entire study area, especially if there are delays and congestion. As such, the volumes used herein may be considered conservative.

Hurontario Street & John Street/Cooksville GO

Traffic operational issues were projected along Hurontario Street in future background conditions. Several movements are projected to experience operational issues such as LOS "F" with volume-to-capacity ratios above 1.0 at Hurontario Street & John Street/Cooksville GO. However, it is noted that the volume-to-capacity ratios expected are only moderately above 1.0, indicating that vehicles may require more than one cycle length to advance through the intersection during the peak hours.

These conditions are somewhat typical in high volume urban areas during the peak periods within the GTHA, including the Hurontario Street corridors. Given these findings, it is recommended that the City monitor traffic operations along the Hurontario Street corridor within the study area, in the future and revise the associated signal timing plans, as required, to maintain safe and efficient traffic operations. The recommended monitoring will also confirm the rate at which projected traffic growth actually materializes, to assist the City in planning for signal timing optimization along the corridor.

Furthermore, it is recommended that the City consider revising the lane configuration of the east approach at Hurontario Street & John Street/Cooksville GO. Instead of the shared through right-turn movement in the righthand curb lane, as outlined in the most recent design plates, an exclusive right-turn movement should be considered. This change would accommodate the high number of westbound-right traffic projected at the intersection, and result in improved overall conditions during the peak hours. However, it is anticipated that intersection performance of the default lane configuration in practical conditions may be similar to the recommended configuration since with the high westbound left-turn volumes, the westbound through/right curb lane may operate as a defacto westbound right-turn lane.

Hurontario Street & Hillcrest Avenue/Kirwin Avenue

The signalized intersection of Hurontario Street & Hillcrest Avenue/Kirwin Avenue is expected to operate at a LOS "F" and "E" during the weekday a.m. and p.m. peak hours, respectively, with an intersection control delay of 123 seconds or better and an intersection volume-to-capacity ratio of 1.12 or better. During the weekday a.m. peak hour, the eastbound left-turn and southbound through-right lanes are forecasted to operate above capacity with volume-to-capacity ratios above 1.0. However, all other movements during the weekday a.m. and p.m. peak hours are expected to operate below capacity.

As outlined above, vehicles may require more than one cycle length to clear the intersection during the peak hours. However, these conditions are typical in congested areas during the peak periods within the GTHA, including the Hurontario Street corridor. Given these findings, it is recommended that the City monitor traffic operations along the Hurontario Street corridor, within the study area, in the future and revise the associated signal timing plans, as required, to maintain safe and efficient traffic operations.

Dundas Street East & Kirwin Avenue/Camilla Road

Under the existing signal timing plan, the intersection of Dundas Street East & Kirwin Avenue/Camilla Road continues to operate at a LOS “D” or better during the weekday a.m. and p.m. peak hour. The intersection is expected to operate with a volume-to-capacity ratio of 0.65 or better and a control delay of 36 seconds or better. It is noted that the southbound left-turn movement has a volume-to-capacity ratio above 1.0 during both the weekday a.m. and p.m. peak hours. As such, the signal timing plan was optimized.

Upon optimizing the signal timing plan (Signal Optimized #1), the Dundas Street East & Kirwin Avenue/Camilla Road intersection is expected to operate at a LOS “C” with a control delay of 30 seconds or better and a volume-to-capacity ratio of 0.68 or better during the weekday a.m. and p.m. peak hours. Furthermore, the no movements are expected to have a volume-to-capacity ratio over 1.0.

Hillcrest Avenue & Cooksville GO

Finally, the intersection of Hillcrest Avenue & Cooksville GO is forecasted to operate similarly to existing conditions at a LOS “B” or better and with no notable operational issues during both the a.m. and p.m. weekday peak hour periods.

Table 17: 2029 Future Background Traffic Operations – Unsignalized Intersections

Intersection (Control)	Movement	LOS		Delay (s)		v/c ratio[2]	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
John Street & Jaguar Valley Drive	**Overall[1]**	**B**	**B**	**11**	**11**	**0.09**	**0.12**
	EBTR	-	-	0	0	0.09	0.09
	WBLT	A	A	0	0	0.00	0.01
	NBLTR	B	B	11	11	0.08	0.12
Kirwin Avenue & Jaguar Valley Drive	**Overall[1]**	**A**	**B**	**9**	**11**	**0.32**	**0.48**
	EBL	A	A	9	10	0.02	0.05
	EBTR	A	B	10	11	0.32	0.33
	WBL	A	A	8	9	0.01	0.02
	WBTR	A	B	10	13	0.25	0.48
	NBLTR	A	A	8	10	0.07	0.17
	SBLTR	A	A	9	9	0.10	0.10
John Street & Little John Lane	**Overall[1]**	**A**	**B**	**10**	**10**	**0.16**	**0.18**
	EBTR	-	-	0	0	0.06	0.06
	WBLT	A	A	3	2	0.01	0.00
	NBLTR	A	B	10	10	0.16	0.18
Kirwin Avenue & Little John Lane	**Overall[1]**	**A**	**B**	**9**	**10**	**0.35**	**0.46**
	EBL	A	A	8	9	0.03	0.04
	EBT	B	A	11	10	0.35	0.28
	WBT	A	B	9	12	0.21	0.46
	WBR	A	A	8	8	0.15	0.20
	SBLR	A	A	9	9	0.16	0.11

Note 1: The overall LOS of a two-way stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000). The overall LOS of an AWSC intersection is based on the overall delay for the intersection (HCM 2010).

Under 2029 future background conditions, the unsignalized intersections within the study road network are generally operating efficiently with moderate delays and reserve capacity to accommodate future traffic growth. These operations are consistent with the operations under the 2024 existing conditions.

3.7.1 Queueing Analysis

Finally, as outlined in **Section 2.5**, Synchro was used to conduct a queuing assessment and estimate 95th percentile queues within the study road network. The a.m. and p.m. peak hour 95th percentile queues were compared against the auxiliary turn storage lane lengths at the study intersections to understand if there is at least the potential for occasional queuing exceedances.

Table 18 outlines the 2029 future background queuing assessment.

Table 18: 2029 Future Background Queuing Assessment

<table>
<tr><th colspan="2" rowspan="3">Intersection</th><th colspan="4">Performance Metrics</th></tr>
<tr><th rowspan="2">Movement</th><th colspan="2">95th Percentile Queue Length (m)</th><th rowspan="2">Auxiliary Lane Storage Length (m)</th></tr>
<tr><th>A.M.</th><th>P.M.</th></tr>
<tr><td rowspan="10">Hurontario Street & John Street/ Cooksville GO</td><td rowspan="5">Shared WBTR Lane</td><td>EBL</td><td>182</td><td>165</td><td>200[1]</td></tr>
<tr><td>WBL</td><td>6</td><td>13</td><td>25</td></tr>
<tr><td>NBL</td><td>6</td><td>27</td><td>37.5</td></tr>
<tr><td>SBL</td><td>72</td><td>66</td><td>48.5</td></tr>
<tr><td>SBR</td><td>62</td><td>14</td><td>48.5</td></tr>
<tr><td rowspan="5">Exclusive WBR Lane</td><td>EBL</td><td>189</td><td>165</td><td>200</td></tr>
<tr><td>WBL</td><td>6</td><td>14</td><td>25[2]</td></tr>
<tr><td>NBL</td><td>6</td><td>27</td><td>37.5</td></tr>
<tr><td>SBL</td><td>52</td><td>65</td><td>48.5</td></tr>
<tr><td>SBR</td><td>47</td><td>12</td><td>48.5</td></tr>
<tr><td colspan="2" rowspan="4">Hurontario Street & Hillcrest Avenue/Kirwin Avenue</td><td>EBL</td><td>187</td><td>49</td><td>185[3]</td></tr>
<tr><td>WBL</td><td>95</td><td>45</td><td>50</td></tr>
<tr><td>NBL</td><td>91</td><td>90</td><td>53</td></tr>
<tr><td>SBL</td><td>50</td><td>107</td><td>36</td></tr>
<tr><td rowspan="12">Dundas Street East & Kirwin Avenue/ Camilla Road</td><td rowspan="6">Existing Signal</td><td>EBL</td><td>6</td><td>17</td><td>15</td></tr>
<tr><td>EBR</td><td>8</td><td>3</td><td>30</td></tr>
<tr><td>WBL</td><td>19</td><td>21</td><td>30</td></tr>
<tr><td>WBR</td><td>9</td><td>21</td><td>65</td></tr>
<tr><td>NBL</td><td>33</td><td>29</td><td>36</td></tr>
<tr><td>SBL</td><td>139</td><td>123</td><td>40</td></tr>
<tr><td rowspan="6">Signal Optimized #1</td><td>EBL</td><td>8</td><td>20</td><td>15</td></tr>
<tr><td>EBR</td><td>10</td><td>4</td><td>30</td></tr>
<tr><td>WBL</td><td>27</td><td>27</td><td>30</td></tr>
<tr><td>WBR</td><td>11</td><td>39</td><td>65</td></tr>
<tr><td>NBL</td><td>34</td><td>29</td><td>36</td></tr>
<tr><td>SBL</td><td>87</td><td>75</td><td>40</td></tr>
<tr><td colspan="2">Hillcrest Avenue & Cooksville GO</td><td>No Auxiliary Turn Lanes</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="2">John Street & Jaguar Valley Drive</td><td>No Auxiliary Turn Lanes</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="2" rowspan="2">Kirwin Avenue & Jaguar Valley Drive[4]</td><td>EBL</td><td>0</td><td>0</td><td>20</td></tr>
<tr><td>WBL</td><td>0</td><td>0</td><td>15</td></tr>
<tr><td colspan="2">John Street & Little John Lane</td><td>No Auxiliary Turn Lanes</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="2" rowspan="2">Kirwin Avenue & Little John Lane[4]</td><td>EBL</td><td>0</td><td>0</td><td>10</td></tr>
<tr><td>WBR</td><td>1</td><td>1</td><td>50</td></tr>
</table>

Note 1: Based on distance to upstream intersection.
Note 2: Based on existing storage length as future storage length is not provided in the most recent design drawings.
Note 3: Two-way left-turn lane storage.
Note 4: Queuing results for the AWSC intersections based on HCM 2010 methodology.

Hurontario Street & John Street/Cooksville GO

Similar to existing conditions, the minor queuing exceedances at the Hurontario Street & John Street/Cooksville GO intersection is forecasted. However, these queue exceedances can be accommodated within the provided taper and are not expected to appreciably impact traffic operations.

For the southbound left-turn movement, the most recent Hazel McCallion LRT design drawings appear to include a painted median via pavement markings, at the north end of the delineated southbound left-turn lane, such that the total available storage is approximately 120 metres. Should sufficient space exist, it is recommended that the pavement markings be revised to extend the provided storage to 65 metres for the southbound left-turn movement and mitigate potential queuing impacts.

Hurontario Street & Hillcrest Avenue/Kirwin Avenue

Under 2029 future background conditions, queuing constraints are most notable at the intersection of Hurontario Street & Hillcrest Avenue/Kirwin Avenue. In the most critical cases, each of the four left-turn movement 95th percentile queues are projected to extend beyond their respective turn-lane storage. For the eastbound and northbound left-turn movements, the associated advanced and protected left-turn phases are expected to clear queues to avoid spillback and/or starvation impacts on the adjacent vehicle travel lanes.

Similarly to the Hurontario Steet & John Street/Cooksville GO intersection, for the southbound left-turn movement at Hurontario Street & Hillcrest Avenue/Kirwin Avenue, the most recent Hazel McCallion LRT design drawings appear to include a painted median via pavement markings, at the north end of the delineated southbound left-turn lane, such that the total available storage is approximately 90 metres. Should sufficient space exist, it is recommended that the pavement markings be revised to maximize the provided storage for the southbound left-turn movement and mitigate potential queuing impacts.

For the westbound left-turn movement, while there is no protected left-turn phase, the wide median is expected allow vehicles to queue beyond the storage bay without impacting vehicle movements in either of the bi-directional travel lanes. Furthermore, most of the expected queues can be accommodated within the provided storage and taper. Therefore, the noted queueing issues at this study intersection are expected to be mitigated.

Dundas Street East & Kirwin Avenue/Camilla Road

Consistent with existing conditions, queuing concerns are expected for the southbound left-turn movement at Dundas Street East & Kirwin Avenue/Camilla Avenue for the optimized signal timing plan (Signal Optimized #1). It is noted that the expected queue of 87 metres, during the weekday a.m. peak hour, cannot be accommodated within the provided storage and taper. However, similar to existing conditions, impacts to the adjacent vehicle travel lane are expected to be mitigated due to the protected left-turn phase.

The City should monitor the traffic volumes and queues post- Hazel McCallion LRT to determine if improvements for the southbound left-turn movement is required. Should improvements be required, the City can consider adjusting the pavement markings, including on-street parking on the east, to extend the southbound left-turn lane storage. It is noted that the adjustments to on-street parking is only expected to affect a few driveways, thus not significantly impacting residents in the area.

It is also noted that the eastbound left-turn queue is expected to extend beyond the provided storage. However, the queue can be accommodated within the storage and taper length.

3.8 Future Background Recommendations Summary

Table 19 summarizes the future background recommended improvements.

Table 19: Recommended Future Background Improvements

Intersection	Improvement	Responsibility
Hurontario Street & John Street/Cooksville GO	Consider implementing an exclusive westbound right-turn movement, instead of a shared westbound through-right-turn movement. Optimize the signal timing plan, providing the following green time (Exclusive WBR Movement): • EBT: 53.0 s (a.m.), 48.0 s (p.m.) • WBT: 53.0 s (a.m.), 48.0 s (p.m.) • NBL: 9.5 s (a.m.), 14.8 s (p.m.) • NBT: 89.2 s (a.m.), 86.6 s (p.m.) • SBL: 17.8 s (a.m.), 25.4 s (p.m.) • SBT: 97.5 s (a.m.), 97.6 s (p.m.) Consider updating the Hazel McCallion LRT design drawings and revise the planned pavement markings to extend the southbound left-turn lane storage length to at least 65 metres.	City
Hurontario Street & Hillcrest Avenue/Kirwin Avenue	Consider optimizing the signal timing plan, providing the following green time: • EBL: 11.0 s (a.m.), 13.0 s (p.m.) • EBT: 67.0 s (a.m.), 69.0 s (p.m.) • WBT: 56.0 s (a.m.), 56.0 s (p.m.) • NBL: 13.0 s (a.m.), 37.0 s (p.m.) • NBT: 76.4 s (a.m.), 53.0 s (p.m.) • SBL: 16.6 s (a.m.), 38.0 s (p.m.) • SBT: 80.0 s (a.m.), 54.0 s (p.m.) Consider updating the Hazel McCallion LRT design drawings and revise the planned pavement markings to maximize the southbound left-turn lane storage length.	City

Intersection	Improvement	Responsibility
Dundas Street East & Kirwin Avenue/Camilla Road	Consider optimizing the signal timing plan, providing the following green time (Signal Optimized #1): • EBT: 84.0 s (a.m.), 78.0 s (p.m.) • WBL: 0.0 s (a.m.), 11.0 s (p.m.) • WBT: 84.0 s (a.m.), 89.0 s (p.m.) • NBT: 43.0 s (a.m.), 43.0 s (p.m.) • SBL: 33.0 s (a.m.), 28.0 s (p.m.) • SBT: 76.0 s (a.m.), 71.0 s (p.m.) Monitor traffic volumes post- Hazel McCallion LRT and post-Dundas BRT to determine if improvements are required, including: • Adjust pavement markings, including the start of on-street parking on the east side, to extend the southbound left-turn lane storage.	City

4.0 Site Generated Traffic

The Proposed Development will result in additional turning movements at the study intersections. Therefore, this section describes the trip forecasting methodology and results of this forecast for the development proposal.

The site generated traffic forecasting methodology for this study consists of two steps. The first step, Trip Generation, projects the number of trips that originate or are destined for the Proposed Development, while the second step, Trip Distribution and Assignment, assigns trips to the study road network based on the expected distribution of trips to catchment areas and expected shortest paths for trips destined for particular locations.

4.1 Trip Generation (UPDATED)

As noted, the development is proposed to consist of 1,342 residential units and 600 m^2 of commercial space.

Trip generation for the proposed mixed-use development was determined using the methodology outlined below:

- Residential person trips were generated based on Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition for Land Use Categories (LUC) 222 “Multifamily (High-Rise)”. The Dense Multi-use Urban category was also selected to represent the future development and transportation context of the surrounding area. In addition, the Close to Rail Transit setting was used for the residential trip generation due to the development’s proximity to the Cooksvillle GO Station (approximately 650 m).

- As commercial person trips are not available in the ITE Trip Generation Manual, 11th Edition for LUC 822 “Strip Retail Plaza (<40k)”, the commercial person trips were based on the vehicle trip generation outlined in ITE Trip Generation Manual, 11th Edition and converted to person trips using the factors outlined in ITE Trip Generation Manual, 10th

Edition. It is noted that this approach is conservative as the commercial space is small and intended to mainly service residents of the Proposed Development as well as the pedestrian and cycling traffic within the nearby community.

- Due to the mixed-use nature of the development, internal trip capture between the residential and retail uses within the development was then applied based on the ITE Trip Generation Handbook, 3rd Edition. Internal trips were reduced from the baseline person trips.

- Mode split reductions were then applied to the baseline external person trips based on the expected future mode split as outlined in **Section 3.3**. The following mode split was used:

    - 53% Auto Trips
    - 42% Transit Trips
    - 4% Walking Trips
    - 1% Cycling Trips

- The remaining external auto-driver trips generated were used for the future total analysis.

Appendix I includes the relevant excerpts from the ITE Trip Generation Manual, 11th Edition; ITE Trip Generation Manual, 10th Edition; and ITE Trip Generation Handbook, 3rd Edition. **Table 20** summarizes the forecasted trip generation of the proposed mixed-use development.

Table 20: Trip Generation

Trip Type	Land Use	A.M.			P.M.		
		Equation	Trips[1]		Equation	Trips[1]	
			In	Out		In	Out
Person	Residential (LUC 222)	0.65/unit	209	663	0.57/unit	451	314
	Commercial (LUC 822)[2]	3.09/1000 ft^2	12	8	9.42/1000 ft^2	31	31
Internal	Residential (LUC 222)	ITE	1	2	ITE	8	3
	Commercial (LUC 822)		2	1		3	8
External	Residential (LUC 222)	99%	208	661	93%	443	311
	Commercial (LUC 822)		10	7		28	23
Total External Person Trips		**N/A**	**218**	**668**	**N/A**	**471**	**334**
Transit	Residential (LUC 222)	42%	88	278	42%	187	131
	Commercial (LUC 822)		4	3		12	10
Pedestrian	Residential (LUC 222)	4%	8	24	4%	16	11
	Commercial (LUC 822)		0	0		1	1
Cycling	Residential (LUC 222)	1%	2	8	1%	5	4
	Commercial (LUC 822)		0	0		0	0
Auto	Residential (LUC 222)	53%	110	351	53%	235	165
	Commercial (LUC 822)		5	4		15	12
Total External Auto Trips		**N/A**	**115**	**355**	**N/A**	**250**	**177**

Note 1: Rounding may cause appearance of minor discrepancies.
Note 2: Based on the equation for vehicle trips per ITE Trip Generation Manual, 11th Edition as well as the vehicle to person trip conversion per ITE Trip Generation Manual, 10th Edition.

The Proposed Development is expected to generate 886 and 804 two-way external person trips during the weekday a.m. and p.m. peak hours, respectively. Of which, 470 and 427 two-way trips are expected to be vehicle trips based on mode split targets of the study area.

For simplicity, pass-by trips associated with the commercial land use were not accounted for as it would result in only a minor decrease in primary trip generation. However, it is noted that pass-by trips will be expected upon buildout.

Table 21 outlines the automobile trip generation comparison per the April 2024 and September 2024 site plans.

Table 21: Trip Generation Comparison

Site Plan	Trip Type	Land Use	Trips[1]					
			A.M.			P.M.		
			In	Out		In	Out	
April 2024	Auto	Residential (LUC 222)	107	340	448	228	159	387
		Commercial (LUC 822)	6	4	11	17	14	31
	Total External Auto Trips		**113**	**344**	**459**	**245**	**173**	**418**
September 2024	Auto	Residential (LUC 222)	110 (+3)	351 (+11)	461 (+13)	235 (+7)	165 (+6)	400 (+13)
		Commercial (LUC 822)	5 (-1)	4 (+0)	9 (-2)	15 (-2)	12 (-2)	27 (-4)
	Total External Auto Trips		**115 (+2)**	**354 (+11)**	**470 (+11)**	**250 (+5)**	**177 (+4)**	**427 (+9)**

Note 1: Rounding may cause appearance of minor discrepancies.

In comparison to trip generation for the Proposed Development outlined in the previous submission (Crozier, April 2024), the most recent proposal generates an additional 11 and 9 two-way vehicle trips during the weekday a.m. and p.m. peak hours, respectively. As the increase in vehicle trip generation is not significant from a traffic operations perspective, the modelling and analysis was not updated herein.

4.2 Trip Distribution and Assignment

The trips generated by the Proposed Development were distributed to the study road network using 2016 TTS data. **Appendix J** includes the data from the TTS queries.

4.2.1 Residential Trips

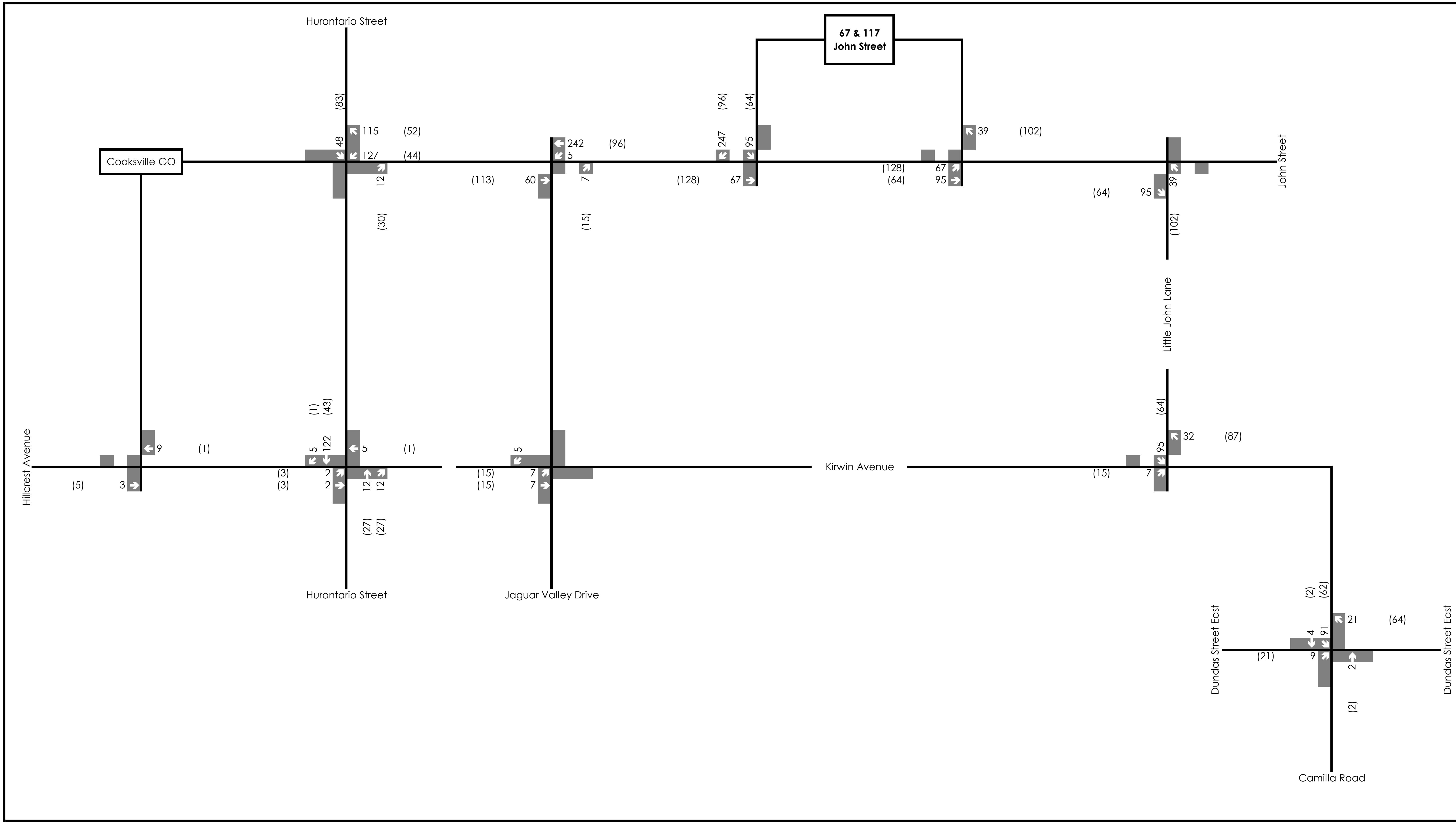
The subject property is located in 2006 GTA Zone 3862. To increase the sample size of the survey, surrounding proxy zones (2006 GTA Zone 3667, 2006 GTA Zone 3668, and 2006 GTA Zone 3724) were also used to determine the residential trip distribution. The vehicle trips generated by the development are distributed to the boundary road network based on TTS 2016 data filtered by residential trips around the study area. TTS results were filtered to trips entering, and exiting the zones separately, for residential purposes during weekday a.m. and p.m. peak hours. Trips were assumed to travel to and from their destination based on the most convenient route possible.

Table 22 outlines the residential trip distribution for the Proposed Development.

Table 22: Residential Trip Distribution

Gateway	A.M.		P.M.	
	In	Out	In	Out
North at Hurontario Street	45%	34%	36%	33%
East at Dundas Street	20%	27%	28%	39%
South at Hurontario Street	14%	14%	15%	14%
South at Camila Road	2%	1%	1%	1%
West at Hillcrest Avenue	3%	3%	2%	0%
West at Dundas Street	16%	22%	18%	13%

Figure 13 outlines the residential trip assignment for the development.



Legend

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

69 & 117 John Street

Residential Trip Assignment

CROZIER CONSULTING ENGINEERS

Figure 13

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Date. 2024.09.17
Analyst. MY

4.2.2 Commercial Trips

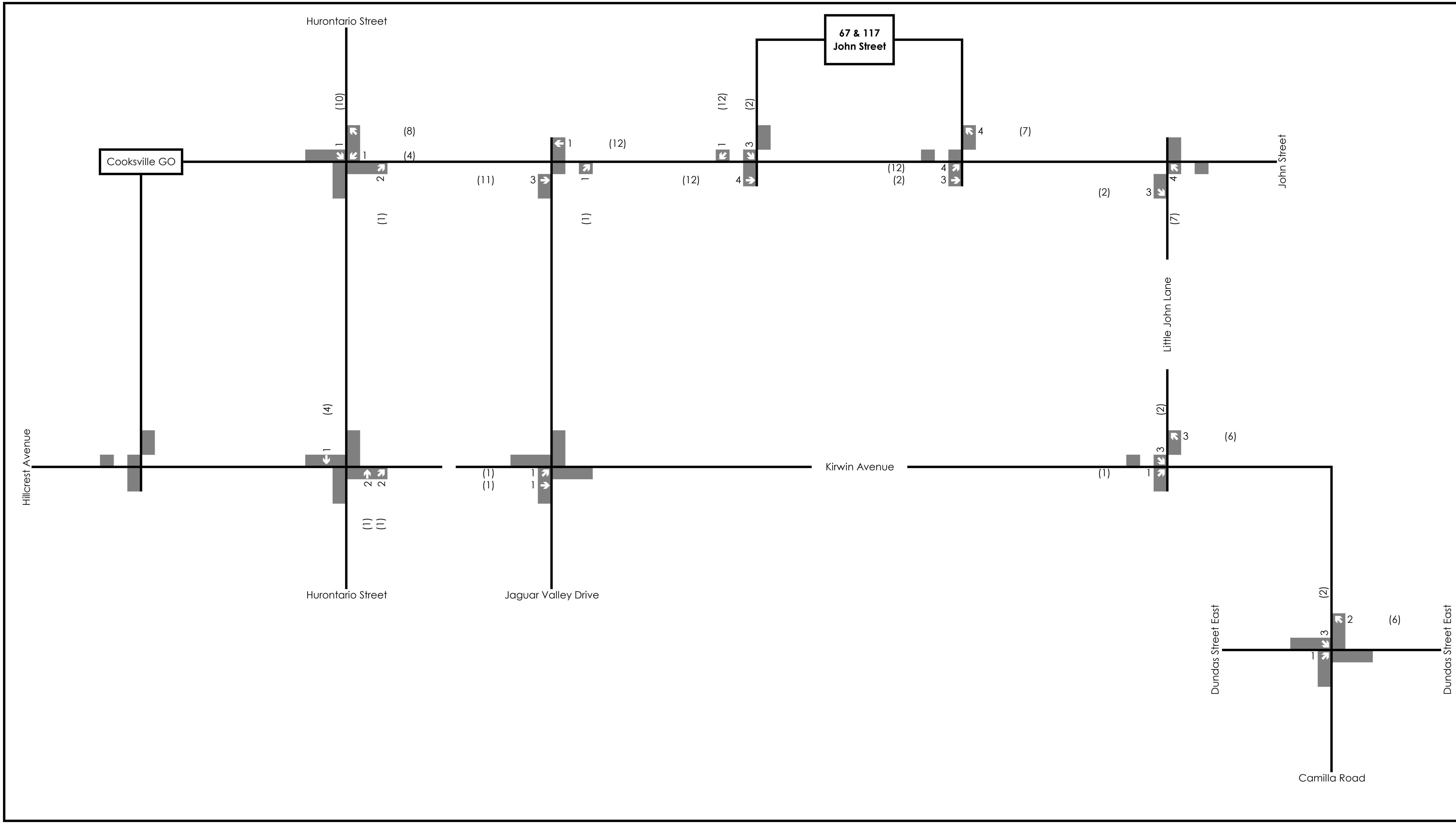
The subject property is located in 2006 GTA Zone 3862. To increase the sample size of the survey, surrounding proxy zones (2006 GTA Zone 3867, 2006 GTA Zone 3871, and 2006 GTA Zone 3872) were also used to determine the commercial trip distribution. The vehicle trips generated by the development are distributed to the boundary road network based on TTS 2016 data filtered by commercial trips around the study area. TTS results were filtered to trips entering, and exiting the zones separately, for commercial purposes during weekday a.m. and p.m. peak hours. Trips were assumed to travel to and from their destination based on the most convenient route possible.

Table 23 outlines the commercial trip distribution for the Proposed Development.

Table 23: Commercial Trip Distribution

Gateway	A.M.		P.M.	
	In	Out	In	Out
North at Hurontario Street	21%	0%	56%	56%
East at Dundas Street	34%	78%	38%	15%
South at Hurontario Street	30%	17%	4%	9%
South at Camila Road	3%	5%	0%	0%
West at Dundas Street	11%	0%	3%	20%

Figure 14 outlines the commercial trip assignment for the development.



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

69 & 117 John Street

Commercial Trip Assignment

CROZIER CONSULTING ENGINEERS

Figure 14
Project No. 2378-6557
Date. 2024.09.17
Analyst. MY

4.2.3 Transit Trips (UPDATED)

As requested by City staff, the transit trip distribution and assignment were reviewed herein. The site generated transit trips are expected use the following transit services:

- GO Train
- Hazel McCallion LRT
- MiWay Bus
- Toronto Transit Commission (TTC) Subway

Existing Transit Distribution

TTS transit data were used to determine the existing transit trip distribution by transit service. The TTS data was filtered for trips originating in the Subject Site's zone, 2006 GTA Zone 3862, as well as proxy zones (2006 GTA Zone 2666, 2006 GTA Zone 3667, 2006 GTA Zone 3723, 2006 GTA Zone 3724, 2006 GTA Zone 3687), during the a.m. peak period (trips starting between 6:00 a.m. to 9:30 a.m.). The first and second transit routes were reviewed as this encompasses riders who only take one transit route as well as those who transfer routes.

Table 24 outlines the existing transit trip distribution.

Table 24: Existing Transit Trip Distribution

Transit Service	Existing Transit Trip Distribution
Milton GO Train	26%
Lakeshore West GO Train	1%
MiWay Bus	60%
TTC Subway	2%
MiWay Bus & Lakeshore West GO Train	5%
MiWay Bus & GO Bus	3%
MiWay Bus & TTC Subway	3%
Total	**100%**

Appendix J includes the relevant TTS data.

Future Transit Trip Distribution

While the TTS data provides valuable insight into transit trip choices at the time of undertaking the survey in 2016, the results do not consider impacts of future transit lines and service improvements. Accordingly, future transit forecasts were refined with consideration for all-day two-way service on the Milton GO Line, the Hazel McCallion LRT, and redundant bus service modifications along Hurontario Street once the Hazel McCallion LRT is operational.

Hazel McCallion LRT Adjustments

Upon completion of the Hazel McCallion LRT, new transit trips along this route are expected as a result of direct trip generation and conversion of existing transit trips from MiWay bus routes operating along the Hurontario-Main corridor. Such bus trips would become redundant when a more convenient LRT is operational.

Currently, the MiWay 103 (Hurontario Express) and MiWay 2 (Hurontario) operate along the Hurontario-Main corridor near the Subject Site. The previous MiWay 19 (Hurontario), was replaced by two split routes - MiWay 2 (Hurontario) and MiWay 17 (Hurontario). As such, the MiWay 19 (Hurontario) route is listed in the available TTS data as well as the Hazel McCallion LRT data; however, trips associated with this route have been assumed to be replaced by the MiWay 2 (Hurontario) route herein.

TTS data identifies that over 60% of transit trips from the study area are attributable to MiWay Bus routes operating along the Hurontario-Main Corridor as well as other connecting routes along key transit spines (e.g. Dundas Corridor). The Milton GO Line also accounts for approximately 26% of transit trips. Approximately 5% of transit users use the Lakeshore West GO Line at Port Credit GO, but typically access the statin via connecting MiWay bus routes. However, once the LRT is operational, commuters intending to travel to Port Credit GO station can do so more conveniently via the LRT and would be converted from using the current bus route. **Figure 15** illustrates the existing trip distribution as well as the breakdown of MiWay Bus transit trips.

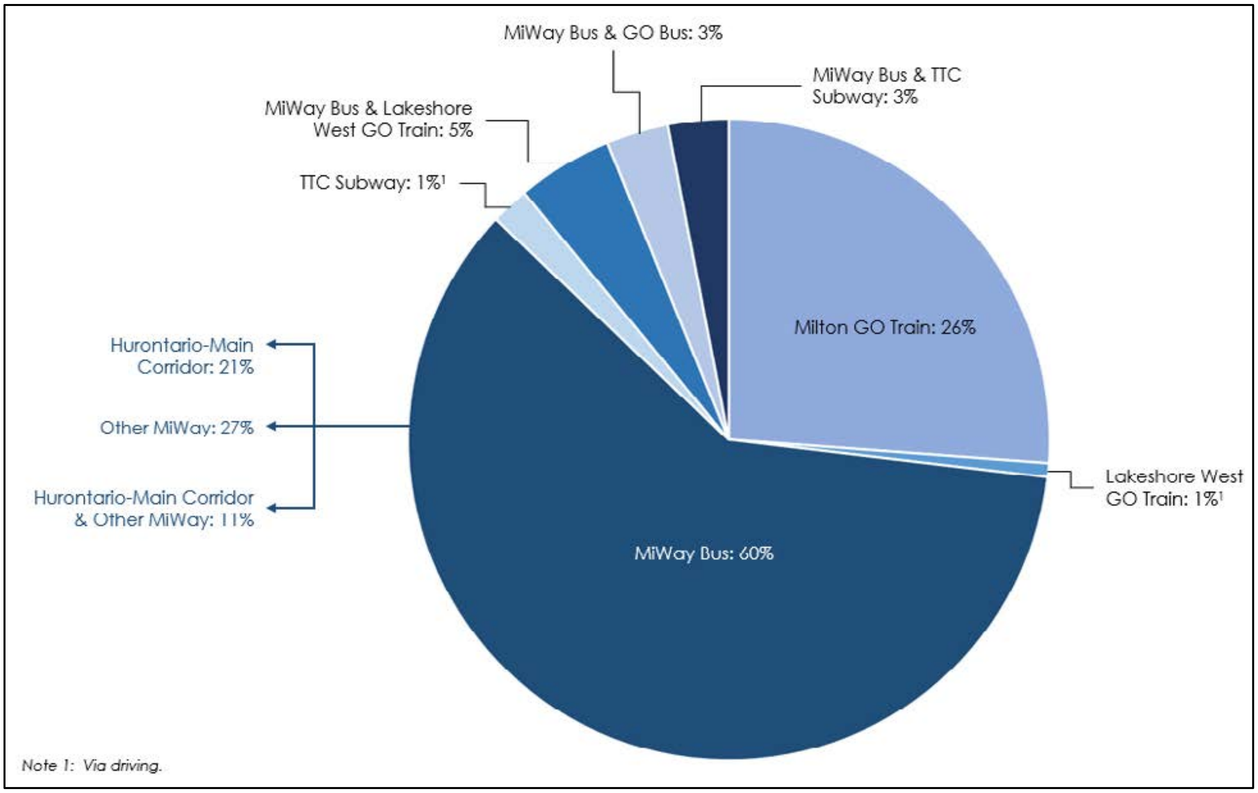


Figure 15: Existing Transit Trip Distribution Breakdown

It is noted that some transit trips were observed to take a MiWay bus from another route, to access a Hurontario-Main Corridor MiWay bus. This is due to the inclusion of proxy zones which are located further away from the Hurontario-Main corridor, as requested by staff. As the Subject Site is in close proximity of the Hurontario-Main corridor and the associated MiWay bus service, these trips were included in the Hurontario-Main Corridor MiWay Bus distribution.

As not all current transit trips along the Hurontario-Main corridor are expect convert to the Hazel McCallion LRT, the expected boarding projections along the corridor during the 2031 a.m. peak period were used to determine the future splits. The expected boardings, as outlined in the Hurontario Benefits Case Analysis, are forecasted to be:

- Hazel McCallion LRT: 22,550 boardings
- Hurontario-Main Corridor MiWay Bus: 6,150 boardings

To account for this split between LRT and bus service in future forecasts, existing Hurontario Corridor MiWay trips were split between the Hazel McCallion LRT (79%) and Hurontario-Main Corridor MiWay Bus (21%) as consistent with the Benefits Case Analysis. This proportion was applied to all Hurontario-Main Corridor MiWay Bus trips.

Appendix G includes the relevant future transit excerpts.

Other Adjustments

In reviewing the future transit network in conjunction with the existing transit trends, the following assumptions beyond those pertaining to the Hazel McCallion LRT were made:

- In addition to the existing Milton GO Train riders, it is expected that all riders who currently drive or take a MiWay bus to access the TTC Subway at Kipling Station, will instead take the Milton GO Train, from Cooksville GO to Kipling GO, due to the planned improvements, including two-way all-day service and 15-minute headways.

  - Due to the Subject Site's proximity to the Cooksville GO station (approx. 7-min walk), it is expected that nearly all Milton GO Train riders will walk or cycle to the GO station. While some riders may be dropped off due to accessibility requirements, these trips are expected to be negligible.

- Lakeshore West GO Train riders are currently accessing the nearest GO station, Port Credit GO, by driving or MiWay bus. With the buildout of the Hazel McCallion LRT, all Lakeshore West GO Train riders are expected to take the LRT to the Port Credit GO station due to the improved and reliable travel times as well as expected fare savings associated with Ontario's One Fare Program.

  - Riders are expected to walk or cycle from the Subject Development to the future Hazel McCallion LRT stop at Hurontario Street & John Street/Cooksville GO, due to the close proximity of the Subject Site.

- The existing distribution for MiWay Bus & GO Bus is expected to remain unchanged as these routes do not operate along the Hurontario-Main Corridor and there are no major improvements planned.

Future Transit Route Distribution

Table 25 outlines the forecasted transit trip distribution.

Table 25: Forecasted Transit Trip Distribution

Transit Service/Route	**Trip Distribution**
Milton GO Train	26%
Lakeshore West GO Train	-
Hazel McCallion LRT	17%
MiWay Bus	34%
Milton GO & TTC Subway	5%
Hazel McCallion LRT & Lakeshore West GO Train	6%
MiWay Bus & GO Bus	3%
Hazel McCallion LRT & MiWay Bus	9%
MiWay Bus & TTC Subway	-
Total	**100%**

Future Transit Trip Assignment

The transit trip assignment was determined based on the forecasted transit trip distribution as well as the updated transit trip generation outlined in **Section 4.1**. **Table 26** outlines the forecasted transit trip assignment.

Table 26: Forecasted Transit Trip Assignment

Transit Service	% of Trips	A.M. Trips[1]		P.M. Trips[1]	
		In	Out	In	Out
Milton GO Train	26%	24	74	52	37
Lakeshore West GO Train	-	-	-	-	-
Hazel McCallion LRT	17%	15	47	33	24
MiWay Bus	34%	32	97	68	48
Milton GO & TTC Subway	5%	5	14	10	7
Hazel McCallion LRT & Lakeshore West GO Train	6%	5	16	11	8
MiWay Bus & GO Bus	3%	3	9	6	4
Hazel McCallion LRT & MiWay Bus	9%	8	25	18	13
MiWay Bus & TTC Subway	-	-	-	-	-
Total	**100%**	**92**	**281**	**198**	**141**

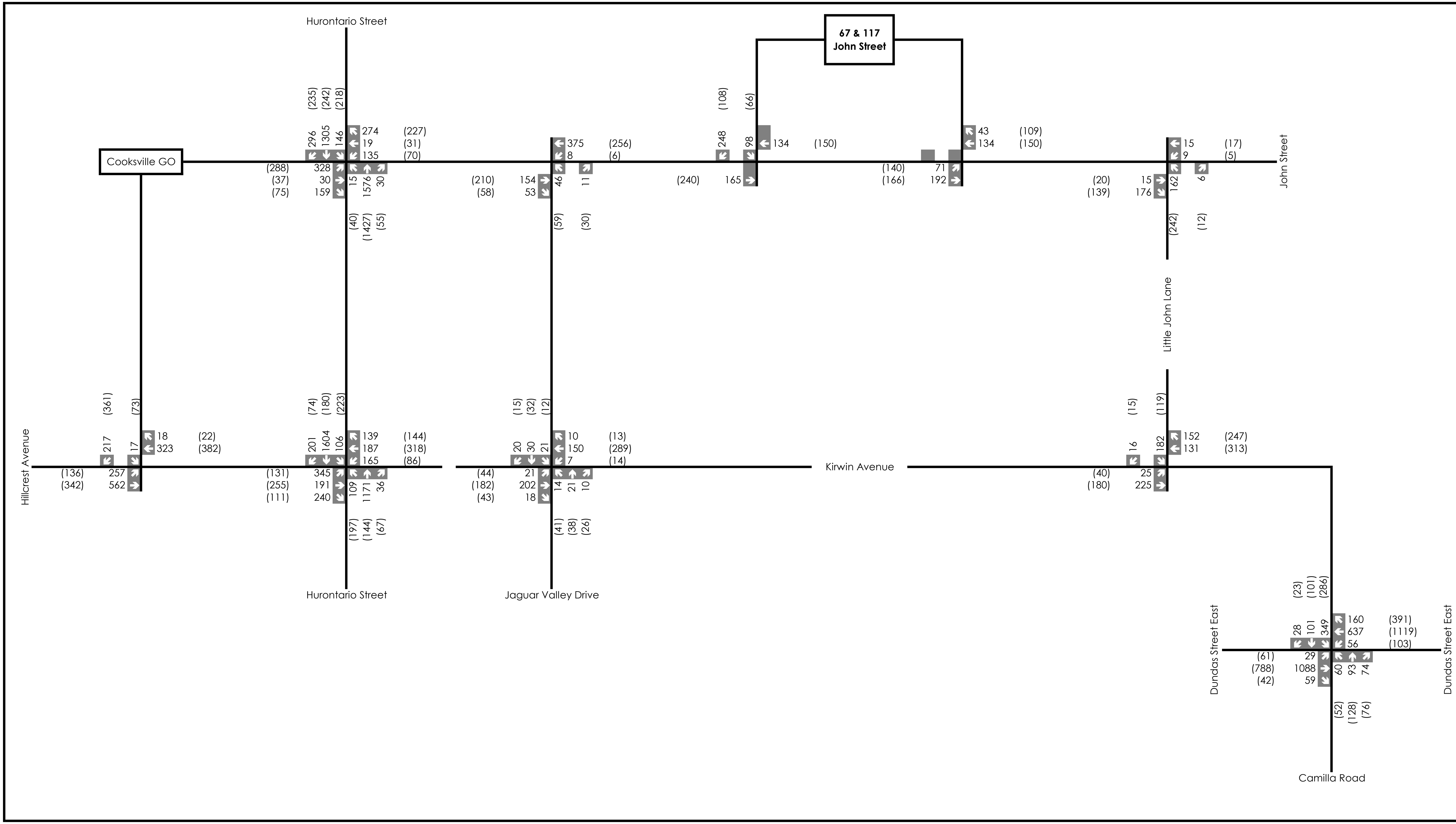
Note 1: Rounding may cause appearance of minor discrepancies.

5.0 Future Total Conditions

This section will summarize the future total conditions of the study road network. The future total traffic volumes for the horizon years consist of the following components:

- Future Background Traffic Volumes
- Proposed Development's Site Generated Traffic Volumes

Figure 16 outlines the resulting total volumes for the 2029 horizon year.



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

69 & 117 John Street

2029 Future Total Traffic Volumes

CROZIER CONSULTING ENGINEERS

Figure 16
Project No. 2378-6557
Date. 2024.09.17
Analyst. MY

5.1 Traffic Modelling and Assumptions (UPDATED)

The intersection of John Street & Little John Lane was modelled as AWSC. As outlined in **Section 5.4** and **Section 8.0**, AWSC is recommended as it is warranted and will facilitate safe north-south pedestrian crossings.

Signal timing plans are kept consistent with future background conditions, for comparative purposes. Once again, for future total conditions, PHFs of 0.92 and lost time adjustments of -1.0 were kept unchanged from existing and future background operations.

As outlined in **Section 4.1**, a fulsome update of future total operational analysis was not prepared. However, with the updated East Site Access configuration the updated operations for John Street & Little John Lane and John Street & East Site Access were updated and included herein.

5.2 Intersection Operations (UPDATED)

Table 27 and **Table 28** outlines the 2029 future total traffic operations for signalized and unsignalized study intersections, respectively. **Appendix F** contains the detailed capacity analysis worksheets.

Table 27: 2029 Future Total Traffic Operations – Signalized Intersections

Intersection		Movement	Performance Metrics					
			LOS[1]		Delay (s)		v/c ratio[2]	
			A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Hurontario Street & John Street/Cooksville GO	Shared WBTR Lane	**Overall**	**F**	**F**	**93**	**85**	**1.21**	**1.11**
		EBL	F	F	170	149	1.20	1.13
		EBTR	D	D	37	41	0.29	0.17
		WBL	D	D	40	42	0.45	0.24
		WBTR	D	D	37	41	0.28	0.16
		NBL	F	E	86	79	0.57	0.49
		NBTR	F	F	131	94	1.18	1.09
		SBL	F	F	300	137	1.40	1.12
		SBT	D	B	46	19	0.92	0.16
		SBR	C	B	25	20	0.41	0.21
	Exclusive WBR Lane	**Overall**	**E**	**E**	**64**	**61**	**1.07**	**1.01**
		EBL	F	F	126	111	1.07	1.00
		EBTR	D	D	46	47	0.35	0.20
		WBL	D	D	53	48	0.59	0.29
		WBT	D	D	41	45	0.04	0.08
		WBR	D	D	50	48	0.56	0.26
		NBL	F	E	86	79	0.57	0.49
		NBTR	F	E	81	58	1.07	1.00
		SBL	F	F	189	145	1.13	1.06
		SBT	C	B	30	15	0.82	0.15
		SBR	B	B	18	16	0.36	0.21

Intersection		Movement	LOS[1] A.M.	LOS[1] P.M.	Delay (s) A.M.	Delay (s) P.M.	v/c ratio[2] A.M.	v/c ratio[2] P.M.
Hurontario Street & Hillcrest Avenue/Kirwin Avenue		**Overall**	**F**	**E**	**142**	**56**	**1.17**	**0.48**
		EBL	F	E	207	65	1.29	0.77
		EBTR	D	D	41	48	0.41	0.44
		WBL	F	E	97	64	0.91	0.59
		WBTR	D	E	47	68	0.35	0.78
		NBL	F	E	101	79	0.83	0.80
		NBTR	D	C	50	28	0.92	0.16
		SBL	F	F	83	81	0.82	0.81
		SBTR	F	C	243	23	1.40	0.19
Dundas Street East & Kirwin Avenue/Camilla Road	Signal Optimized #1	**Overall**	**D**	**C**	**35**	**33**	**0.73**	**0.72**
		EBL	B	C	16	33	0.11	0.43
		EBT	C	C	25	28	0.65	0.53
		EBR	B	B	15	20	0.06	0.04
		WBL	C	B	26	17	0.39	0.35
		WBT	B	C	19	24	0.39	0.64
		WBR	B	B	16	19	0.13	0.38
		NBL	E	E	65	60	0.42	0.31
		NBTR	E	E	77	77	0.73	0.77
		SBL	F	E	86	70	0.98	0.90
		SBTR	D	D	37	38	0.24	0.23
	Signal Optimized #2	**Overall**	**C**	n/a	**34**	n/a	**0.73**	n/a
		EBL	B		17		0.11	
		EBT	C		26		0.66	
		EBR	B		16		0.06	
		WBL	C		27		0.40	
		WBT	B		20		0.39	
		WBR	B		17		0.13	
		NBL	E		65		0.42	
		NBTR	E		77		0.73	
		SBL	E		75		0.94	
		SBTR	D		36		0.23	
Hillcrest Avenue & Cooksville GO		**Overall**	**A**	**B**	**8**	**12**	**0.34**	**0.26**
		EBLT	A	A	4	4	0.35	0.21
		WBTR	A	A	4	4	0.16	0.19
		SBL	C	C	25	27	0.09	0.37
		SBR	C	C	25	26	0.16	0.26

Note 1: The LOS of a signalized intersection is based on the average control delay per vehicle (HCM 2000).
Note 2: All intersection v/c ratios above 0.85 as well as movements above 1.0 are bolded with red text.

Overall, traffic operations at the signalized study intersections are similar under 2029 future total conditions when compared to 2029 future background conditions. The LOS are expected to remain unchanged at the signalized study intersections between future background and future total conditions.

Hurontario Street & John Street/Cooksville GO

Consistent with future background conditions, an exclusive westbound right-turn lane at Hurontario Street & John Street/Cooksville GO is expected to result in better traffic operations than a shared westbound through right-turn lane. As outlined in **Section 3.7**, the City should consider updating the planned east approach lane configuration to include an exclusive right-turn lane at Hurontario Street & John Street/Cooksville GO.

With an exclusive westbound right-turn lane under 2029 future total conditions, Hurontario Street & John Street/Cooksville GO is expected to operate at an unchanged LOS "E" or better during the weekday a.m. and p.m. peak hours compared to 2029 future background conditions. The intersection is expected to operate with a maximum increase of 14 seconds in intersection control delay and 0.08 in intersection volume-to-capacity ratio.

Consistent with future background conditions, some movements are expected to have operational concerns with LOS "F" and/or volume-to capacity ratios of 1.0. As discussed in future background conditions, these operations are typical within congested areas during peak periods within the GTHA as well as along transit corridors, such as Hurontario Street.

Hurontario Street & Hillcrest Avenue/Kirwin Avenue

Under 2029 future total conditions, the Hurontario Street & Hillcrest Avenue/Kirwin Avenue intersection is expected to operate at an unchanged LOS "F" and "E" during the weekday a.m. and p.m. peak hours, respectively, when compared to future background conditions. Furthermore, the intersection control delay and intersection volume-to-capacity ratio is expected to increase by a maximum of 19 seconds and 0.05, respectively.

It is noted that operational concerns are expected at some movements, including LOS "F" and/or volume-to-capacity ratios above 1.0. However, these conditions are consistent with future background conditions.

Dundas Street East & Kirwin Avenue/Camilla Road

The optimized signalized intersection of Dundas Street East & Kirwin Avenue/Camilla Road (Signal Optimized #1) is expected to operate at an unchanged LOS "C" during the weekday a.m. and p.m. peak hours under 2029 future total conditions compared to future background conditions. The intersection is also expected to operate with an increase of 6 seconds and 0.06 in intersection control delay and intersection volume-to-capacity ratio, respectively.

It is noted that the southbound left-turn movement is expected to operate with a LOS "F" during the weekday a.m. peak hour. As such, the City should monitor traffic volumes and queues post-Hazel McCallion LRT and post-Dundas BRT to determine if improvements for the southbound left-turn movement are required. Should improvements be required, the City can consider implementing an alternate optimized timing plan (Signal Optimized #2) for the weekday a.m. peak hour as well as the previously recommended storage length increase. While slight increases in delay may result due to the new timing plan, the most operationally constrained movements on the minor street approaches will see delay reduction, with no material impact to operations along the Dundas Street corridor.

Hillcrest Avenue & Cooksville GO

Consistent with future background conditions, Hillcrest Avenue & Cooksville GO is expected to operate at a LOS “B” with low control delays and volume-to-capacity ratios during the weekday a.m. and p.m. peak hours.

Summary

The Subject Development does not materially impact the traffic operations at the signalized study intersections. Moreover, the operational issues observed under future total conditions is consistent with future background conditions. As such, the Subject Development is supportable from a transportation operations perspective and not further improvements are required.

Table 28: 2029 Future Total Traffic Operations – Unsignalized Intersections

Intersection (Control)	Movement	LOS A.M.	LOS P.M.	Delay (s) A.M.	Delay (s) P.M.	Maximum v/c ratio[2] A.M.	Maximum v/c ratio[2] P.M.
John Street & Jaguar Valley Drive	**Overall[1]**	**B**	**B**	**14**	**14**	**0.14**	**0.20**
	EBTR	-	-	0	0	0.13	0.17
	WBLT	A	A	0	0	0.01	0.01
	NBLTR	B	B	14	14	0.14	0.20
Kirwin Avenue & Jaguar Valley Drive	**Overall[1]**	**A**	**B**	**10**	**11**	**0.33**	**0.48**
	EBL	A	A	9	10	0.04	0.09
	EBTR	B	B	10	11	0.33	0.36
	WBL	A	A	8	9	0.01	0.02
	WBTR	A	B	10	13	0.25	0.48
	NBLTR	A	A	8	10	0.07	0.18
	SBLTR	A	A	9	9	0.11	0.10
John Street & Little John Lane	**Overall[1]**	**B**	**B**	**11**	**11**	**0.22**	**0.33**
	EBTR	-	-	0	0	0.12	0.10
	WBLT	A	A	3	2	0.01	0.00
	NBLR	B	B	11	11	0.22	0.33
Kirwin Avenue & Little John Lane	**Overall[1]**	**B**	**B**	**10**	**11**	**0.38**	**0.49**
	EBL	A	A	9	9	0.05	0.07
	EBT	B	B	11	11	0.38	0.30
	WBT	A	B	10	13	0.22	0.49
	WBR	A	A	9	10	0.22	0.34
	SBLR	B	B	11	11	0.33	0.24
John Street & West Site Access	**Overall[1]**	**B**	**B**	**13**	**12**	**0.46**	**0.26**
	EBLT	-	-	0	0	0.00	0.00
	WBTR	-	-	0	0	0.09	0.10
	SBLR	B	B	13	12	0.46	0.26
John Street & East Site Access	**Overall[1]**	**A**	**A**	**3**	**4**	**0.11**	**0.17**
	EBLT	A	A	3	4	0.06	0.12
	WBTR	-	-	0	0	0.11	0.17

Note 1: The overall LOS of a two-way stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000). The overall LOS of an AWSC intersection is based on the overall delay for the intersection (HCM 2010).

All of the unsignalized study intersections, including John Street & West Site Access and John Street & East Site Access, are expected to continue operating efficiently with an acceptable LOS under 2029 future total traffic conditions. This is consistent with the operations observed under future background conditions. As such, the Proposed Development is expected to have a minimal impact on the unsignalized study intersections and is supportable from a transportation operations perspective.

5.2.1 Queuing Analysis (UPDATED)

As outlined in **Section 2.5**, Synchro was used to conduct a queuing assessment and estimate 95th percentile queues within the study road network. The a.m. and p.m. peak hour 95th percentile queues were compared against the auxiliary turn storage lane lengths at the study intersections to understand if there is at least the potential for occasional queuing exceedances.

Table 29 outlines the results of the 2029 future total queuing assessments.

Table 29: 2029 Future Total Queuing Assessment

<table>
<tr><th colspan="2" rowspan="3">Intersection</th><th colspan="4">Performance Metrics</th></tr>
<tr><th rowspan="2">Movement</th><th colspan="2">95th Percentile Queue Length (m)</th><th rowspan="2">Auxiliary Lane Storage Length (m)</th></tr>
<tr><th>A.M.</th><th>P.M.</th></tr>
<tr><td rowspan="10">Hurontario Street & John Street/ Cooksville GO</td><td rowspan="5">Shared WBTR Lane</td><td>EBL</td><td>200</td><td>176</td><td>200[1]</td></tr>
<tr><td>WBL</td><td>58</td><td>33</td><td>25</td></tr>
<tr><td>NBL</td><td>6</td><td>27</td><td>37.5</td></tr>
<tr><td>SBL</td><td>116</td><td>141</td><td>48.5</td></tr>
<tr><td>SBR</td><td>62</td><td>14</td><td>48.5</td></tr>
<tr><td rowspan="5">Exclusive WBR Lane</td><td>EBL</td><td>189</td><td>165</td><td>200[1]</td></tr>
<tr><td>WBL</td><td>66</td><td>36</td><td>25[2]</td></tr>
<tr><td>NBL</td><td>6</td><td>27</td><td>37.5</td></tr>
<tr><td>SBL</td><td>105</td><td>137</td><td>48.5</td></tr>
<tr><td>SBR</td><td>47</td><td>12</td><td>48.5</td></tr>
<tr><td colspan="2" rowspan="4">Hurontario Street & Hillcrest Avenue/Kirwin Avenue</td><td>EBL</td><td>189</td><td>50</td><td>185[3]</td></tr>
<tr><td>WBL</td><td>95</td><td>45</td><td>50</td></tr>
<tr><td>NBL</td><td>91</td><td>90</td><td>53</td></tr>
<tr><td>SBL</td><td>52</td><td>106</td><td>36</td></tr>
<tr><td rowspan="12">Dundas Street East & Kirwin Avenue/ Camilla Road</td><td rowspan="6">Signal Optimized #1</td><td>EBL</td><td>12</td><td>33</td><td>15</td></tr>
<tr><td>EBR</td><td>10</td><td>4</td><td>30</td></tr>
<tr><td>WBL</td><td>27</td><td>27</td><td>30</td></tr>
<tr><td>WBR</td><td>12</td><td>49</td><td>65</td></tr>
<tr><td>NBL</td><td>33</td><td>29</td><td>36</td></tr>
<tr><td>SBL</td><td>127</td><td>105</td><td>40</td></tr>
<tr><td rowspan="6">Signal Optimized #2</td><td>EBL</td><td>12</td><td rowspan="6">n/a</td><td>15</td></tr>
<tr><td>EBR</td><td>10</td><td>30</td></tr>
<tr><td>WBL</td><td>29</td><td>30</td></tr>
<tr><td>WBR</td><td>12</td><td>65</td></tr>
<tr><td>NBL</td><td>33</td><td>36</td></tr>
<tr><td>SBL</td><td>121</td><td>40</td></tr>
<tr><td colspan="2">Hillcrest Avenue & Cooksville GO</td><td>No Auxiliary Turn Lanes</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="2">John Street & Jaguar Valley Drive</td><td>No Auxiliary Turn Lanes</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="2" rowspan="2">Kirwin Avenue & Jaguar Valley Drive[4]</td><td>EBL</td><td>0</td><td>0</td><td>20</td></tr>
<tr><td>WBL</td><td>0</td><td>0</td><td>15</td></tr>
</table>

Intersection	Performance Metrics			
	Movement	95th Percentile Queue Length (m)		Auxiliary Lane Storage Length (m)
		A.M.	P.M.	
John Street & Little John Lane	No Auxiliary Turn Lanes	-	-	-
Kirwin Avenue & Little John Lane[4]	EBL	0	0	10
	WBR	1	2	50
John Street & West Site Access	No Auxiliary Turn Lanes	-	-	-
John Street & East Site Access	No Auxiliary Turn Lanes	-	-	-

Note 1: Based on distance to upstream intersection.
Note 2: Based on existing storage length as future storage length is not provided in the most recent design drawings.
Note 3: Two-way left-turn lane storage.
Note 4: Queuing results for the AWSC intersections based on HCM 2010 methodology.

Similar to future background conditions, the future total conditions queuing assessment results in several of instances where 95th percentile queues exceed the auxiliary turn lane storage length.

Hurontario Street & John Street/Cooksville GO

At the intersection of Hurontario Street & John Street/Cooksville GO, the westbound left-turn and southbound left-turn queues have materially worsened as a result of development traffic when compared to future background conditions, while the remaining 95th percentile queuing projections are effectively the same as future background conditions.

As outlined for future background conditions in **Section 3.7.1**, for the southbound left-turn movement, the most recent Hazel McCallion LRT design drawings appear to show a paved median behind the southbound left-turn lane. Should sufficient space exist, it is recommended that pavement marking revisions be pursued to maximize the provided storage to mitigate potential queuing impacts. Given the southbound left-turn movement is planned to have an advanced protected left-turn phase, queuing issues are also expected to be minimized.

The planned westbound left-turn lane storage length at Hurontario Street & John Street/Cooksville GO is not provided in the most recent design drawings. As such, the City should consider providing minimum of 70 metre storage length is provided for the westbound auxiliary left-turn lane to accommodate the projected 95th percentile queues under 2029 future total conditions.

Hurontario Street & Hillcrest Avenue/Kirwin Avenue

At the intersection of Hurontario Street & Hillcrest Avenue/Kirwin Avenue, queuing issues are consistent with future background conditions. The eastbound and northbound left-turn movements are continued to be expected to be mitigated by the advanced and protected left-turn phases.

As outlined in **Section 3.7.1**, it is recommended that pavement marking revisions be implemented to maximize the provided storage for the southbound left-turn movement and mitigate potential queueing impacts. Regardless, the queueing concerns are expected to be mitigated by the protected left-turn phase.

Consistent with future background conditions, the westbound left-turn queues are expected to be mitigated by the wide median and provided taper which will also for additional vehicles to queue beyond the storage length.

Dundas Street East & Kirwin Avenue/Camilla Road

The queueing concerns for the southbound left-turn movement at Dundas Street East & Kirwin Avenue/Camilla Road (Signal Optimized #1) are similar to future background conditions. The available storage length of 40 metres, in comparison to the maximum 95th percentile queue of up to 130 metres, is expected to be operationally adequate due to the following rationales:

- Similar to future background conditions, the advanced protected left-turn phase allows the queues to clear and avoid impacting adjacent through traffic upon commencement of the circular green phase.

- Significant distance (approximately 270 metres) to the nearest intersection along Kirwin Avenue before intersecting with Dundas Street East provides more than adequate capacity for queuing after the storage lanes splits.

- Given that Kirwin Avenue and Camilla Road are collector roads, traffic flow is not as critical when compared to arterials. Occasional queuing blockages during the peak hours would not compromise the purpose of the roadway.

The City should continue to monitor traffic volumes and queues post- Hazel McCallion LRT and post-Dundas BRT to determine if improvements for the southbound left-turn movement are required. Should improvements be required, the City can consider the following:

- Adjust the pavement markings, including on-street parking on the east, to extend the southbound left-turn lane storage. It is noted that the adjustments to on-street parking are only expected to affect a few driveways, thus not significantly impacting residents in the area.

- Adjust the signal timing plan (Signal Optimized #2) for the weekday a.m. peak period to increase the allotted green time for the protected southbound left-turn and/or minor approach movements.

5.3 Signal Warrant Assessment (UPDATED)

The signal warrant assessment was conducted at each of the unsignalized study intersections, including at the proposed site accesses off John Street.

The analysis was conducted based on Chapter 4 of the Ontario Traffic Manual (OTM) Book 12: Traffic Signals (Ontario Ministry of Transportation, March 2012). As only peak hour volumes were available, Justification 7: Projected Volumes was selected as the most appropriate warrants to assess the unsignalized study intersections.

The average hour volume was determined using the following formula from OTM Book 12:

$$AHV = (amPHV + pmPHV) / 4$$

Where:

AHV = average hour volume
amPHV = a.m. peak hour volume

pmPHV = p.m. peak hour volume

As the study road network has an operating speed of less than 70 km/h, restricted flow was used for the signal warrant analysis. **Table 30** summarizes the signal warrant analysis.

Table 30: Signal Warrant Analysis

Location	Scenario	Flow Conditions	Number of Lanes on Major Road	Signal Warranted?
John Street & Jaguar Valley Drive	2029 Future Total	Restricted Flow (Urban)	One	No
Kirwin Avenue & Jaguar Valley Drive	2029 Future Total	Restricted Flow (Urban)	One	No
John Street & Little John Lane	2029 Future Total	Restricted Flow (Urban)	One	No
Kirwin Avenue & Little John Lane	2029 Future Total	Restricted Flow (Urban)	One	No
John Street & West Site Access	2029 Future Total	Restricted Flow (Urban)	One	No
John Street & East Site Access	2029 Future Total	Restricted Flow (Urban)	One	No

As outlined in **Table 30**, traffic signals are not warranted any of the unsignalized study intersections, including at the proposed site accesses.

Appendix K contains the signal warrant analysis.

5.4 All-Way Stop Control Warrant Assessment (UPDATED)

An AWSC warrant assessment was conducted for John Street & Little John Lane. The warrant was reviewed for John Street & Little John Lane as AWSC would provide improved pedestrian crossings for pedestrians accessing the Subject Development.

The analysis was conducted based on Chapter 2 of OTM Book 5: Regulatory Signs. The following justifications were selected as the most appropriate warrants to assess the John Street & Little John Lane:

- Justification 1: Total Vehicle Volume on all Intersection Approaches
- Justification 2A: Combined Vehicle and Pedestrian Volumes on Minor Street
- Justification 2B: Combined Vehicle and Pedestrian Volumes on Minor Street and Minor Street Delay
- Justification 3: Volume Split (Vehicles Only)

Based on the 2029 Future Total vehicle and pedestrian volumes, AWSC is warranted at the intersection of John Street & Little John Lane. It is noted that the pedestrian volumes used in the analysis does not include the expected pedestrian volumes due to the Subject Development. As such, the future pedestrian volumes expected at the intersection is greater than used in the warrant analysis.

Appendix L contains the AWSC warrant analysis.

5.5 Future Total Recommendations Summary

Table 31 outlines the recommended future total improvements. These improvements should be implemented in addition to the future background warranted improvements outlined in **Table 19**.

Table 31: Recommended Future Total Improvements

Intersection	Improvement	Responsibility
Hurontario Street & John Street/Cooksville GO	Consider updating the Hazel McCallion LRT design drawings and revise the planned pavement markings to maximize the southbound left-turn lane storage length. Consider providing westbound left-turn lane storage length of at least 70 metres.	City/Developer
Dundas Street East & Kirwin Avenue/Camilla Road	Continue to monitor traffic volumes post-Hazel McCallion LRT and post-Dundas BRT to determine improvements are required, including: • Adjust pavement markings, including the start of on-street parking on the east side, to extend the southbound left-turn lane storage. • Adjust the signal timing plans (Signal Optimized #2) for the weekday a.m. peak period to increase the green time for the southbound left-turn and/or minor approach movements,	City
John Street & Little John Lane	Implement AWSC.	Developer

6.0 Site Circulation Review

The proposed Site Plan was reviewed from a circulation perspective. The section herein reviews both the vehicle maneuverability and pedestrian circulation.

6.1 Vehicle Maneuverability

This section considers the internal vehicle maneuverability of the Subject Site to confirm vehicles can safely operate without conflicts or constraints. Vehicle Turning Diagrams were prepared using AutoTURN software.

The following design vehicles are expected to operate on site and are reviewed herein:

- Region of Peel Typical Waste Collection Vehicle
- Region of Peel Typical Fire Truck
- Medium Single Unit (MSU) Truck (Delivery Trucks)
- TAC p-car

Appendix M includes the Vehicle Turning Diagrams.

6.1.1 Waste Collection Vehicles

Vehicle Turning Diagrams illustrate that the Region of Peel's typical waste collection vehicle can safely maneuver in an out of the proposed loading space and site accesses without conflicts. It is noted that while the West Site Access will be one-way outbound for passenger vehicles, larger trucks will use the West Site Access for inbound and outbound access to the Subject Site.

A vehicle warning system is proposed at the loading facilities and West Site Access to improve the awareness and safety of motorists. Further details are included in **Section 8.0**.

6.1.2 Emergency Vehicles

A maneuvering assessment was conducted for emergency vehicles using the typical Region of Peel Fire Truck. The typical Region of Peel Fire Truck can safely enter and exit the proposed Site Accesses as well as circulate throughout the Subject Development.

6.1.3 Loading Vehicles

As outlined in the Vehicle Turning Diagrams, a MSU truck can safely enter and exit the proposed Site Accesses and loading space without conflicts. In addition, two (2) MSU trucks can safely access the pick-up/drop-off (PUDO)/loading area at one time.

6.1.4 Passenger Vehicles

Based on the Vehicle Turning Diagrams, passenger vehicles can safely enter and exit the Proposed Development using the proposed Site Access as well as maneuver straight through the drive aisles, parking ramps and corner drive aisles simultaneously. Furthermore, passenger vehicles can safely park in the proposed at-grade layby parking spaces.

6.1.5 Summary

Based on the review of the vehicle circulation for the key design vehicles noted above, the Site Plan is supportable from a vehicle circulation perspective.

6.2 Pedestrian Circulation

The Site Plan proposed pedestrian facilities to support safe pedestrian circulation throughout the Subject Site. Pedestrian facilities are provided along all the buildings' frontages. These pedestrian facilities provide safe and convenient access to all the proposed building entrances. The internal pedestrian facilities are proposed to connect to the existing sidewalks fronting the Subject Site along John Street. Furthermore, north-south, and east-west crosswalks are proposed throughout the Subject Development, where applicable, to facilitate safe pedestrian crossings.

Appendix N includes the Pedestrian Circulation Plan.

7.0 Site Access Review

The development proposal includes two (2) site accesses off John Street that will provide transportation servicing to and from the site. This section evaluates the suitability of the site accesses from a transportation safety perspective and recommends mitigation measures, if warranted. The safety review of the accesses includes an assessment of whether vehicle maneuvers can be made safely at the site accesses without issues related to sight lines as well as access spacing and corner clearance.

7.1 Intersection Sight Distance

The available sightlines at the proposed site accesses were measured and compared to the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) (June 2017). Sight distance was measured from the proposed site access using the following assumptions:

- A standard drive eye height of 1.08 metres for a passenger car.
- An object height of 0.6 metres.
- A 4.4 metre setback from the approximate extension of the outer curb (or edge of pavement) to represent a vehicle waiting to exit the site.

Intersection sight distances is calculated using equation 9.9.1 from the GDGCR as outlined below:

$$ISD = 0.278 * V_{major} * t_g$$

Where:

ISD = Intersection Sight Distance
V_{major} = design speed of roadway (km/h)
t_g = assumed time gap for vehicles to turn from stop onto roadway (s)

The design speed of a roadway is typically 10 km/h greater than the posted speed for posted speeds of 50 km/h or less. As the posted speed limit on John Street is 40 km/h, a design speed of 50 km/h was assumed for sight distance analysis.

It is noted that the East Site Access is a one-way inbound access and thus vehicles are not expected to exit using this access. As such, the sight distance requirements were not reviewed at the East Site Access herein.

Table 32 outlines the sight distance requirements for the proposed site accesses and compares them to the available sight distance.

Table 32: Intersection Sight Distance Assessment

Access	West Site Access	
Maneuver	**Left-Turn**	**Right-Turn**
Access Type	Full Moves	
Intersection Control	Case B: Stop Control on Minor Road	
Posted Speed Limit of Roadway	40 km/h (Posted)	
Assumed Design Speed	50 km/h	
Grade of Roadway	Assumed less than 3%	
Horizontal Alignment of Roadway	Straight	
Base Time Gap	7.5 s	6.5 s
Additional Time Gap	None	None
Sight Distance Required	105 m	91 m
Measured Sight Distance[1]	110+ m	95+ m

Note 1: Measured using aerial imagery.

John Street is straight, with minimal grade changes, and no visual obstructions are noted. Based on the most recent Site Plan, adequate sight distance is expected to be achieved at the West Site Access.

Given the cul-de-sac located at the eastern terminus of John Street, approximately 160 metres east of the Western Site Access, oncoming cars from the east are expected to be traversing the roadway either from a stopped position or at a significantly lower speed than the posted speed limit. Therefore, the sight distance required can be considered conservative as it assumes oncoming vehicles are travelling at faster speeds than are expected to occur due to the physical constraints.

Overall, there are no sight distance concerns at the proposed West Site Access; thus, the West Site Access is supportable from an intersection sight distance perspective.

Appendix O contains relevant TAC GDGCR excerpts.

7.2 Access Spacing and Corner Clearance (UPDATED)

Access spacing was checked against TAC GDGCR requirements for local roadways and commercial accesses. Additionally, TAC GDGCR was used to review corner clearance spacing for the proposed site accesses.

Table 33 presents the site access spacing requirements and proposed spacing. The assessment was based upon the TAC GDGCR Figure 8.9.2 and Figure 8.8.2 for access spacing and corner clearance, respectively.

Table 33: Access Spacing Review

Site Access	Direction of Street	Access Spacing		Corner Clearance		Satisfied?
		Required	Provided	Required	Provided	
West	West	3 m	~45 m	15 m	>100 m	Yes
	East		~35 m	15 m	~55 m	Yes
East	West	3 m		15 m	>130 m	Yes
	East		~90 m	15 m	n/a[1]	Yes

Note 1: East terminus of John Street is located east of Little John Lane.

As outlined in **Section 1.2**, the most recent Site Plan proposes the East Site Access to be shifted east, offset from the John Street & Little John Lane intersection. This shift was implemented to address comments received from City Fire staff, which required the fire trucks to avoid travelling under any portion of the proposed buildings. Regardless, the minimum access spacing, and corner clearance requirements are met. Furthermore, TAC notes for accesses on opposite sides of the road, such as the East Site Access and Little John Lane, the relationship does not impact traffic volumes on low volume roadways such as local roads, including John Street.

Overall, there are no access spacing or corner clearance concerns associated with the two (2) proposed site accesses Thus, the proposed site accesses are supportable.

Appendix O contains relevant TAC GDGCR excerpts.

8.0 Safety Review

The development proposal was reviewed for potential conflicts and the recommendations identified are summarized in **Table 34.**

Table 34: Proposed Safety Recommendations

Safety Measure	Detail
All Way Stop Control at John Street & Little John Lane	All way stop control is warranted and recommended at John Street & Little John Lane to facilitate safe and controlled north-south pedestrian crossings given the pedestrian trip generation forecasted and increased connectivity throughout the Subject Development.
Convex Mirrors	Convex mirrors are recommended in the underground parking and loading areas to maximize visibility where drive aisles intersect and where pedestrians and/or cyclists may also benefit from increased visibility.
Vehicle Warning Sign with Lights	A vehicle warning sign system with lights is recommended at the loading entrances to visually alert pedestrians, cyclists and other motorists of egressing trucks. The system may also provide walk/don't walk instructions via pedestrian-scale signal heads to pedestrians crossing the access/loading area, the details of which would be refined in a subsequent submission.

9.0 Parking Requirements (UPDATED)

The following section reviews the adequacy of the parking supply of the Proposed Development. The Subject Development proposes a total vehicle parking supply of 940 spaces and is located in Precinct 1.
The parking review includes an assessment of the proposed parking supply of the development against the requirements outlined in the City of Mississauga Zoning By-Law 0225-2007.

Appendix P contains the relevant City of Mississauga Zoning By-Law No. 0225-2007 excerpts.

9.1 Vehicle Parking

Table 35 outlines the parking requirements per the prevailing City of Mississauga Zoning By-Law 0117-2022.

Table 35: City of Mississauga Zoning By-Law 0225-2007 Vehicle Parking Requirements

Land Use	Type	Statistic	Parking Rate	Required Parking	Proposed Parking
Condominium Apartment	Resident	1,342 units	0.8 space per unit	1,074 spaces	669 spaces (-405 spaces)
	Visitor		0.2 space per unit	268 spaces	153 spaces (-115 spaces)
Retail[1]		600 m²	3 spaces per 100 m²	18 spaces	
Total				**1,342 spaces**	**822 spaces (-520 spaces)**

Note 1: Per Section 3.1.2.1.3 of the City of Mississauga Zoning By-Law 0225-2007, a shared parking arrangement may be used to calculate the residential visitor/non-residential parking requirements. The minimum parking requirement is the greater of the residential visitor and non-residential parking requirements.

Per the Zoning By-Law, the Proposed Development is required to provide 1,342 vehicle parking spaces. As the development proposes 822 parking spaces, a vehicle parking deficit is proposed in comparison to the City's Zoning By-Law requirements.

9.2 Barrier-Free Parking

For a development with a required number of visitor parking spaces between 201 and 1000, 2 spaces plus 2% of the total required visitor parking spaces must comply with all regulations of an accessible parking space, per the City of Mississauga Zoning By-Law 0225-2007.

As 281 visitor parking spaces are required, a minimum of eight (8) accessible parking spaces are required. The Site Plan provides 18 accessible parking spaces, which exceeds the Zoning By-Law requirements.

9.3 Bicycle Parking

The City of Mississauga Zoning By-Law 0225-2007 has been reviewed to determine the minimum bicycle parking required. **Table 36** outlines the minimum bicycle parking requirements.

Table 36: City of Mississauga Zoning By-Law 0225-2007 Bicycle Parking Requirements

Land Use	Type	Statistic	Parking Rate	Required Parking	Proposed Parking
Condominium Apartment	Class A	1,342 units	0.60 space per unit	806 spaces	806 spaces (+0 spaces)
	Class B		0.05 space per unit[1]	68 spaces	68 spaces (+0 spaces)
Retail	Class A	600 m²	0.15 space per 100 m²	1 space	1 space (+0 spaces)
	Class B		0.2 space per 100 m²	2 spaces	2 spaces (+0 spaces)
Total Bicycle				**877 spaces**	**877 spaces (+0 spaces)**

Note 1: The required bicycle parking rate is the greater of 0.05 spaces per unit or six (6) spaces.

As outlined in **Table 36**, to support the Proposed Development, a total of 807 Class A and 70 Class B bicycle parking spaces are required. The Site Plan proposes 877 bicycle parking spaces, comprised of 807 Class A and 70 Class B spaces, thus, the Zoning By-Law requirements are met.

10.0 Parking Review

As noted previously within **Section 9.1**, the vehicle parking supply proposed for the development is lower than the City's Zoning By-Law requirements. However, this does not mean that the proposed supply is not consistent with similar TODs within the City of Mississauga, or that the supply is adequate given the proximity to high-order transit.

To review the adequacy of the proposed parking supply, proposed and approved parking rates for sites with similar land use characteristics and transportation context within the City of Mississauga were examined along with the surrounding policy context in the following section.

10.1 Transportation Context

As outlined in **Section 3.1** and **Section 3.2.1**, the Subject Site is located within the Cooksville GO PMTSA, 250 metres from the Cooksville GO Hazel McCallion LRT stop and within 500 metres from the Cooksville GO Station. The Hazel McCallion LRT provides service along the Hurontario Street corridor from Brampton Gateway Terminal in the City of Brampton to Port Credit GO Station in the southern end of the City of Mississauga, which connects to the Lakeshore West GO Line. The Cooksville GO currently provides access to the Milton GO Line, which spans between Milton and Union Station in Toronto, and is planned for expansion of services to include frequent all-day service.

This places the Subject Site within walking distance from two higher-order transit lines that provide connectivity to the GTHA. The Hazel McCallion LRT will provide improved transit reliability along the Hurontario Street corridor, travelling through two urban growth centres. The future LRT will connect to major transit systems including GO Transit, Mississauga Transitway, Brampton Transit, Züm and MiWay.

Sites located within PMTSAs are expected to have reduced auto parking demands given the ease of access to transit, complimentary land uses, and compact walkable mixed-use development. This is further supported through the province's growth plan for the GTHA, which emphasizes policy adaptations, such as reducing parking requirements, to promote transit use in intensification areas and PMTSAs.

As a large portion of residents and visitors of the Subject Site will be able to rely on transit as opposed to driving for everyday needs, the reduced parking supply would prevent an oversupply of parking and support a compact built form within the Cooksville GO PMTSA.

The high degree to transit accessibility of the Subject Site is reflected in the Zoning By-Law requirements, as the Subject Property is located within Parking Precinct 1, which represents the lowest parking rates in the City. However, it is noted that as the Subject Development is near the future Hazel McCallion LRT and Dundas BRT corridors. As part of both higher order transit improvements, a vehicle travel lane reduction is planned. Due to the expected reduction in vehicle infrastructure along these corridors, a corresponding reduction in on-site vehicle infrastructure, such as parking, should also be implemented in comparison to existing requirements. Reductions in on-site vehicle infrastructure will work in tandem with the transit infrastructure improvements and is reflective of the City's sustainable goals. Further details regarding a reduced parking requirement are outlined in **Section 10.2**.

Furthermore, the Subject Site currently has a walk score of 89, which is reflective of a very walkable community. Many errands can be done on foot with a large variety of uses within a short walk of the development, including supermarkets, schools, and restaurants.

The suite of TDM measures proposed for the development as described in **Section 12.3** is also aimed at reducing both parking demand and peak hour travel demand. Moreover, a reduced parking supply and corresponding unbundling of parking are considered effective TDM measures, particularly for resident parking as future occupants of TODs already tend to have lower vehicle ownership characteristics and higher transit usage as a lifestyle preference.

10.2 Reduced Residential Parking Requirements

As outlined above, a reduction in parking should be implemented to compliment with the vehicle travel lane reductions planned as part of the Hazel McCallion LRT, as well as the Dundas

BRT. City staff have undertaken a review of the parking requirements along the Hazel McCallion LRT and recommend the reduction of residential parking rates along the LRT corridor. While the residential parking rate reduction is not currently in effect, these rates were presented to the Planning Committee on April 8, 2024, and the committee unanimously accepted the motion to implement the reduced parking rate.

Table 37 compares the existing and proposed parking requirements as well as the proposed parking supply.

Table 37: Parking Requirements and Supply Comparison

Land Use	Type	Existing Requirements	Proposed Requirements	Proposed Supply
Residential	Residents	0.80 space per unit	0.50 space per unit	0.50 space per unit
	Visitors	0.20 space per unit	0.15 space per unit	0.11 space per unit
Total		**1.00 space per unit**	**0.65 space per unit**	**0.61 space per unit**

As outlined in **Table 37**, the proposed parking rate of 0.61 space per unit, comprised of 0.50 resident space per unit and 0.11 visitor space per unit. As such, in comparison to the recommended parking requirement of 0.65 space per unit, only a minor deficiency is proposed.

10.3 Bill 185 Parking Requirements in PMTSA (NEW)

In addition to the reduced residential parking requirements along the Hurontario LRT corridor, the Province of Ontario's Bill 185 recently received Royal Assent on June 6, 2024. Among the changes made to the development and approval process, the Province also removed the minimum parking requirements for all new developments, except for Universities, located within a PMTSA.

The Subject Development is located 550 metres from Cooksville GO and is located within the Cooksville GO PMTSA. As such, per Bill 185, the City's parking requirements and recommendations, as outlined in **Section 9.1** and **Section 10.2**, are no longer applicable and there are no minimum parking requirements for the Proposed Development. **Table 38** outlines the parking requirements per Bill 185.

Table 38: Bill 185 Vehicle Parking Requirements

Land Use	Type	Statistic	Parking Rate	Required Parking	Proposed Parking
Condominium Apartment	Resident	1,342 units	0 space per unit	0 spaces	669 spaces (+669 spaces)
	Visitor		0 space per unit	0 spaces	153 spaces (+153 spaces)
Retail[1]		$600\ m^2$	0 space per $100\ m^2$	0 spaces	
Total				**0 spaces**	**822 spaces (+822 spaces)**

As outlined in **Table 38**, the Subject Development exceeds the parking requirements per Bill 185. Thus, the proposed parking supply is supportable.

10.4 Approval Trends in the City of Mississauga

A review of recently proposed and approved development applications within the surrounding area as well as those with similar transportation contexts to the Subject Site was conducted to evaluate the adequacy of the proposed parking supply. This review contains developments within Mississauga's Ward 7 and Ward 1 that provide similar access to local surface transit and regional transit services.

10.4.1 Resident Parking

Table 39 summarizes the currently proposed and observed resident parking rates in these areas, respectively, as well as a comparison to the proposed parking supply.

Table 39: Resident Parking Proposal and Approval Trends in the Area

Site Location	Resident Parking Rate	Status
3757 Kaneff Crescent	0.46 space per unit	Under Review
1485 Williamsport Drive	0.56 space per unit	Surrogate Site Surveys (from 189 Dundas TIS and referenced in 60 Dundas TIS)
6719 Glen Eric Drive	0.61 space per unit	Surrogate Site Surveys (from 189 Dundas TIS and referenced in 60 Dundas TIS)
49 South Service Road	0.29 space per unit	Under Review
0 Park Street East	0.32 space per unit	Under Review
1580-1650 Dundas Street East	0.60 space per unit	Under Review
Summary		
Average	0.47 space per unit	n/a
69 & 117 John Street	0.50 space per unit	Subject Development

The proposed resident parking rate is within the range of proposals and approvals for developments within the area and/or the same transportation context. As such, the proposed residential parking rate can be considered supportable from this perspective, especially given the investment in higher order transit within the study area as well as the TDM strategies proposed in **Section 12.3**.

10.4.2 Visitor Parking

Table 40 summarizes the currently proposed and observed visitor parking rates in these areas, respectively, as well as a comparison to the proposed parking supply.

Table 40: Visitor Parking Proposal and Approval Trends in the Area

Site Location	Visitor Parking Rate	Status
3016-3032 Kirwin Avenue	0.14 space per unit	Under Review
89-95 Dundas Street West	0.15 space per unit	Under Review
86-90 Dundas Street East	0.15 space per unit	Under Review
2444 Hurontario Street	0.15 space per unit	Under Review
1 Fairview Road East	0.10 space per unit	Under Review
1575-1578 Lakeshore Road West	0.06 space per unit	Surrogate Site Survey (from 25 Hillcrest & 3154 Hurontario TIS)
5023-5025 Four Springs Avenue	0.13 space per unit	Surrogate Site Survey (from 25 Hillcrest & 3154 Hurontario TIS)
55-75 Eglinton Avenue West	0.12 space per unit	Surrogate Site Survey (from 25 Hillcrest & 3154 Hurontario TIS)
0 Park Street East	0.10 space per unit	Under Review
17 & 19 Ann Street, 84 High Street & 90 High Street	0.10 space per unit	Under Review
49 South Service Road	0.10 space per unit	Under Review
128 Lakeshore Road East	0.00 space per unit	Under Review
1000 &1024 Dundas Street East	0.10 space per unit	Under Review
28 Park Street East	0.10 space per unit	Surrogate Site Survey (from 70 Park TIS)
28 Elizabeth Street North	0.02 space per unit	Surrogate Site Survey (from 70 Park TIS)
49 Queen Street East	0.13 space per unit	Surrogate Site Survey (from 70 Park TIS)
1 Hurontario Street	0.14 space per unit	Surrogate Site Survey (from 70 Park TIS)
6-8 Ann Street	0.15 space per unit	Surrogate Site Survey (from 70 Park TIS)
66 High Street East	0.15 space per unit	Surrogate Site Survey (from 70 Park TIS)
15 Elizabeth Street North	0.11 space per unit	Surrogate Site Survey (from 70 Park TIS)

Site Location	Visitor Parking Rate	Status
78 Park Street East & 22-28 Ann Street	0.1 space per unit	Approved Development (Site Specific Zoning By-Law 0054-2020)
70 Mississauga Road South	0.15 space per unit	LPAT Case No. PL18019
8 Ann Street	0.15 space per unit	Approved Development (Site Specific Zoning By-Law 0102-2017)
Summary		
Average	0.11 space per unit	n/a
69 & 117 John Street	0.11 space per unit	Subject Development

As outlined in **Table 40**, the approved, proposed and observed developments within similar transportation contexts in the City has an average rate 0.12 visitor space per unit. Thus, the proposed parking rate of 0.15 space per unit for visitors is supportable when considering the parking rates approved, proposed, and observed at similar sites**.** It can also be concluded that the City's existing parking rates would likely be an overestimation of expected parking demand at the proposed site, especially considering the site is situated in a PMTSA that provides direct access to transit.

10.5 Summary

In summary, the reduced parking supply proposed, 0.68 space per unit, is supportable due to the following:

- The Subject Site located in PMTSA, and upon the build out of the Hazel McCallion LRT, will be 500 metres from two (2) higher-order transit lines.

- The City is has reviewed the parking requirements along the Hazel McCallion LRT corridor, with a proposed parking requirement of 0.65 space per unit, per BL.01-PAR. The proposed parking supply rate of 0.61 space per unit is only a minor deficiency compared to the City's recommended requirement.

- Despite the revised parking requirements for developments located along the LRT corridor, the Province removed all minimum parking requirements for new developments, except for Universities, within PMTSAs as part of Bill 185. As the Subject Development is located in the Cooksville GO PMTSA, the minimum parking requirements is zero (0) spaces; therefore the proposed parking supply is supportable.

- The proposed parking supply is consistent with other development proposals and approvals as well as observed at surrogate sites within the surrounding area as well as other areas of the City in similar transportation contexts.

- A myriad of TDM measures, as outlined in **Section 12.3**, are also proposed to support the reduced parking supply and limit the vehicle demand for the Subject Development.

11.0 Loading Review

11.1 Loading Requirements (UPDATED)

The City of Mississauga Zoning By-Law 0225-2007 was reviewed to determine the loading requirements of the Proposed Development.

Table 41: City of Mississauga Zoning By-Law Loading Requirements

Land Use	Statistic	Minimum Loading Requirement	Minimum Loading Required
Apartment	3 buildings	1 loading space per apartment building with a minimum of 30 dwelling units	3 spaces
Retail	600 m^2	1 loading space for greater than 250 m^2 but less than or equal to 2,350 m^2	1 space
Total Required Loading Spaces			4 spaces
Total Proposed Loading Spaces			**1 space (-3 spaces)**

Per the City of Mississauga Zoning By-Law 0225-2007, one loading space must be provided for a n apartment building containing a minimum of 30 units. Further, one loading space must be provided for retail with a gross floor area greater than 250 m² but less than or equal to 2,350 m². As one (1) loading space is provided per the Site Plan, the proposed loading supply is deficient by three (3) spaces.

11.2 Loading Operations

One (1) loading space is provided while the Zoning By-law requires four (4) loading spaces; thus, the Subject Development is technically deficient to the loading requirements by three (3) loading spaces. However, the proposed loading operations are such that additional areas within the Subject Site are proposed to support loading, delivery and move-in/move-out operations in a safe manner.

In addition to the loading space, a pick-up/drop-off (PUDO)/loading zone is also proposed on the north end of the drive aisle, immediately south of Building B. This PUDO/loading zone is centrally located, near the holding rooms in each of the residential buildings and can be utilized for move-ins or deliveries, if needed. Under typical operation, this zone would facilitate pick-ups and drop-offs, and short term deliveries (e.g., UberEats, etc.). When booked, this area can facilitate loading for up to 2 delivery trucks. While this occurs, PUDO can still continue to operate within the remaining lay-by parking spaces south and west of the drive aisle.

Similar to moving or cargo elevators, a booking system will be utilized to manage the loading space and PUDO/loading zone utility. Residential and commercial tenants will be able to book timeslots for the loading space and PUDO/loading zone to ensure that space is available when required for move-ins and/or deliveries on a first-come, first-serve basis. Thus, waste collection vehicles can utilize the loading space, as typical, on waste collection days. This strategy will ensure that conflicts between waste collection, move-ins and deliveries will not occur.

While the PUDO/loading zone does not meet the City's loading space dimension requirements , it can sufficiently accommodate two (2) MSUs or four (4) passenger cars. Furthermore, despite the PUDO/loading zone's dimensions technically being deficient compared to the Zoning By-Law loading space requirements, functionally the PUDO/loading zone is sufficient to address the Subject Development's needs. **Appendix M** includes the MSU Vehicle Turning Diagrams for the PUDO/loading zone.

Lastly, smaller delivery vehicles, such as package, food, or grocery delivery, typically do not use a loading space and are expected to utilize the ten (10) lay-by parking spaces provided on-site.

Overall, given that the loading space demand will be managed via a booking system and a PUDO/loading zone is provided in addition to lay-parking parking spaces, the proposed loading supply and operations is sufficient and supportable.

12.0 Transportation Demand Management

Transportation demand management is the practice of influencing or maximizing the travel choices for users through infrastructure improvements, strategic services and programs, or public outreach, with the purpose of shifting travel demands away from the auto travel mode to make more efficient use of the transportation system.

In April 2018, the City of Mississauga approved its first TDM plan, the TDM Strategy and Implementation Plan. The TDM Strategy and Implementation Plan aims to reduce single-occupant vehicle (SOV) trips, and outlines recommendations and actions for the City to implement.

In addition to the City's existing and future TDM opportunities, the Proposed Development can be supported by the following site-specific TDM strategies:

- TDM Information Package for New Tenants
- TDM Coordinator
- Smart Commute Membership
- Wayfinding Signage
- Flex Workspace Amenity Spaces
- Pick-up/Drop-off Area(s)
- Subsidized Transit Passes
- Real-Time Transit Information Screens
- Secure & Excess Bicycle Parking Spaces
- Bicycle Repair Station
- Reduced Parking Supply
- Unbundled Parking
- Carshare Spaces

12.1 Existing Transit and Active Transportation Opportunities

There are existing TDM opportunities in the study area to encourage the use of non-auto modes of transportation and reduce SOV trips.
As the surrounding area consists of urban commercial land uses, there are many walkable destinations from the subject property such as parks, commercial and retail businesses, fast-food and sit-down restaurants, many of which are located along Hurontario Street and Dundas Street.

As outlined in **Section 2.2**, there are existing transit services in the study area to provide connectivity to the wider GTHA. Several transit routes are available along Hurontario Street and

Dundas Street. Specifically, for the Subject Property, a bus stop is located at Hurontario Street and John Street and/or at Dundas Street and Hurontario Street.
Furthermore, Cooksville GO is a short walk away from the Subject Property (approximately 8 minutes). Thus, daily work commute and weekend trips within and outside of the City can be easily conducted by high capacity, frequent rail services.

The transit availability and options within a short distance from the Subject Property will encourage transit use, and potentially lead to a reduction in SOV trips and parking demands.

12.2 Future Transit and Active Transportation Opportunities

As outlined above, there are significant improvements to the transportation network planned within the study road network. Specifically, the following improvements have been proposed within the study area which are geared towards reducing automobile dependency and maximizing sustainable mode share:

- Hazel McCallion LRT
- Dundas BRT
- Hurontario Street and Dundas Street Cycle Tracks

It is noted that the Dundas BRT and Dundas Street Cycle Tracks is assumed to be built out beyond the 2029 horizon year. Regardless, these improvements are expected to further improve the sustainable mode share in the long term.

12.3 Site Specific TDM Recommendations

There are several opportunities for the development to promote TDM measures at the Site Plan level in support of reduced automobile use. **Table 42** outlines the recommendations which are expected to contribute to reduced automobile use and increased sustainable mode share.

Table 42: Site Specific TDM Recommendations

Recommended/Provided TDM Measure	Implementation Summary
TDM Information Package for New Tenants	Upon and prior to occupancy, a TDM information package should be provided to new and prospective residents and owners. Promotional material should also be readily available (and continuously updated) in the building's lobby to increase awareness of available alternate travel modes and reduce the barriers to adopting more sustainable travel behaviour. Such marketing allows prospective tenants to be aware of sustainable travel options, as well as updates in the transit and cycling infrastructures improvements of the area. TDM Information Package can comprise of: • Active Transportation Network Maps • Transit Maps and Schedules • SmartTripsON • Car Rental and Carshare Locations Neighbourhood commercial, retail, and institutional facilities should also be included in the marketing package to promote local businesses and to promote a walkable mixed-use community. Information on the future transit projects could be provided to prospective buyers to make them aware of pending mass transit opportunities (such as the Hazel McCallion LRT, which can encourage measures such as reduced vehicle ownership and SOV use.
TDM Coordinator	The developer is recommended to assign a staff member to coordinate various TDM initiatives to further ensure the effective implementation of all TDM strategies. This can be coordinated with building management as part of their communications with residents.

Recommended/Provided TDM Measure	Implementation Summary
Smart Commute Membership	The developer and/or future retail tenant is encouraged to join Smart Commute Mississauga. Smart Commute is a program within the Greater Toronto and Hamilton Area (GTHA) committed to helping individuals and organizations travel efficiently and sustainably. Smart Commute works with organizations and employers to provide resources and tools that encourage commuters to utilize transportation alternatives. Smart Commute can assist in facilitating TDM strategies, including but not limited to: • Carpool Ride-Matching Programs • Emergency Ride Home Programs • Discounted Transit Incentive Programs • Walking and Cycling Programs • Campaigns, Events and Promotions Smart Commute presents a collaborative opportunity to reduce the proposed development's SOV trips and automobile dependency through various initiatives, infrastructure, and programs.
Wayfinding Signage	Multi-modal wayfinding signage is recommended throughout the Subject Site. Individuals on-site will be provided directions to transportation services, infrastructure, and key destinations, such as transit stops, bicycle parking and pick-up/drop-off areas, and adjacent commercial facilities.
Flex Workspace Amenity Spaces	A flex workspace (coworking space) is recommended as part of the proposed amenities to encourage remote work. In providing a flex workspace, tenants have access to additional workspace and office-related amenities provided, encouraging residents to work remotely, and eliminating the need to commute during peak hours.

Recommended/Provided TDM Measure	Implementation Summary
Pick-up/Drop-off Area(s)	A PUDO/loading zone as well as two lay-by parking areas are proposed within the Subject Development. It is recommended that these lay-by parking areas be designated as short-term parking or a pick-up/drop-off area to support deliveries, and ride share and taxi services that typically would only require stopping or parking for a short time. The PUDO/loading zone can be booked by residential and retail tenants, when needed for loading, and will operate similarly to the lay-by parking areas at all other times.
Subsidized Transit Pass	Subsidized transit passes should be provided to new tenants at occupancy to encourage transit use as resident's primary mode of transportation. The subsidized transit passes will be provided for two (2) years and the details will be determined at a later date through subsequent discussions.
Real-Time Transit Information Screens	Real-time transit information screens are recommended in the lobby or via wall mounted screens. This provides residents information about transit schedules and real time service delays, increasing reliability for residents to use transit as their primary mode of travel. Residents will also be encouraged to download the Transit app. The Transit app provides users with trip planning and real-time transit information including real time passenger volume counts on buses. The app also allows buses to be tracked along its route and allows for live arrival countdowns that help minimize wait times and notify users if an approaching bus is delayed, and if it is not busy to very busy. Overall, this measure is expected to decrease vehicle dependency and increase transit reliability and perception for tenants to use transit as a primary mode of travel.

Recommended/Provided TDM Measure	Implementation Summary
Secure & Excess Bicycle Parking Spaces	Safe and secure bicycle parking is proposed for the development. Access to safe and secure bicycle parking will increase confidence and reliability for prospective cyclists to cycle as their primary mode of transportation. In addition, nine (9) excess bicycle parking spaces are provided for residents, further encouraging residents to cycle. The provision of cycling maps, short term bicycle parking spaces, and secure long-term spaces encourages bicycle use and provides residents and visitors convenient and safe storage for frequent bicycle use.
Bicycle Repair Station	A small, compact bicycle repair station with a toolkit and pump are also recommended. These stations can be provided near the resident or visitor bicycle parking spaces in order to promote cycling use. These stations also increase confidence and reliability for prospective cyclists to cycle as their primary mode of transportation as cyclists will be able to perform preventative and emergency maintenance on their bike
Reduced Parking Supply	As the proposed resident parking rate is 0.53 space per unit, inherently a parking space is not available for every unit. The proposal therefore allows for a maximum vehicle ownership rate of 0.53 vehicles per unit associated with the residential use. This measure reduces the number of residents with parking spaces on-site and consequently is expected to reduce the number of automobile trips to/from the Subject Development.

Recommended/Provided TDM Measure	Implementation Summary
Unbundled Parking	Parking will be purchased by residents on a first-come first-serve basis in addition to unit costs, as opposed to automatically including a parking space with the unit costs. Prospective tenants should be advised in advance of the parking availability and cost of leasing a parking space, if available. Potential tenants will also be warned of the limited on-street parking in the area. As such, the residential parking demand can be controlled. By advising the parking availability to potential tenants prior to the rental/purchase agreements, the ambiguity of the parking demand and parking availability can be managed. This strategy allows for prospective tenants to choose whether they wish to incur the added cost of purchasing a parking space, particularly if parking is not desired due to vehicle ownership choices and access to sustainable modes such as the nearby Cooksville GO station and future Hazel McCallion LRT stop.
Carshare Spaces	The development is recommended to propose a carshare priority parking zone. The developer should explore the opportunity of providing two (2) carshare spaces with a provider. As the area develops and additional residential demand occurs, carshare spaces should be protected to incentivize use and reduced SOV trips. The ultimate location of the carshare spaces will be confirmed as applications advance.

The Subject Development has a 5 Star rating, the highest rating, per the City's Transportation Demand Management and Pedestrian Circulation Checklist. As such, the recommended TDM measures support the Proposed Development's transit oriented context. **Appendix Q** includes the Transportation Demand Management and Pedestrian Circulation Checklist.

13.0 Community Impacts

The report herein has evaluated and addressed the traffic related community impacts as a result of the Subject Development. **Section 5.1** summarizes the transportation operational impact of the Proposed Development as well as recommended improvements.

As no formal public consultation session has been held regarding the Proposed Development, community concerns have not been provided at this time. Should a public consultation session be conducted in the future, the specific community concerns can be addressed in a subsequent submission.

In lieu of a public consultation, we have reviewed the common concerns and themes outlined by the community for the neighbouring development at 3085 Hurontario Street, as outlined in the Urban Transportation Considerations (BA Group, September 2023). It is noted that the 3085 Hurontario Street development has a similar residential development yield, however, it has a larger commercial yield of 1,160 m^2. **Appendix H** includes the relevant background development excerpts.

The public meeting was held on January 10, 2022, and the transportation related comments from councillors and residents were outlined in BA Group's report. The public comments, as outlined in BA's report, is as follows:

- Support Intensification for Transit Oriented Areas
- Cycling and Pedestrian Access, Circulation and Safety Concerns
- Reduced Visitor Parking Rate Concerns

Crozier's responses to these public comments are outlined in the sections below.

13.1 Support Intensification for Transit Oriented Areas

The Subject Site is located within the Cooksville GO PMTSA and is in proximity to a GO station as well as a future LRT station. As such, the Development Proposal aligns with the desired intensification for the study area.

13.2 Cycling and Pedestrian Access, Circulation and Safety Concerns

As outlined in **Section 6.2**, pedestrian facilities are provided throughout the Subject Site that allows pedestrian to safely circulate the Proposed Development. These pedestrian facilities also connect to the existing pedestrian network to allow for safe pedestrian access. Furthermore, sidewalks are provided along all study roadways, which allows for all transit users to safely walk to the nearby transit stops. AWSC is recommended at the intersection of John Street & Little John Lane to allow for safe north-south pedestrian crossings, which is a marked improvement on the existing conditions.

The Subject Development also provides Class A and Class B bicycle parking spaces in excess of the City's Zoning By-Law requirements as well as a bicycle repair station to support cycling as a viable mode of transportation for the Subject Development's residents and visitors. Furthermore, based on the guidelines outlined in OTM Book 18: Cycling Facilities, a bike lane or bike sharrows may be warranted along John Street and should be considered by the City. The addition of bicycle facilities along John Street will further improve the bicycle connectivity within the study area, connecting to existing and planned facilities along Hurontario Street, Kirwin Avenue and Hillcrest Avenue.

13.3 Reduced Visitor Parking Rate Concerns

It is noted that a reduced visitor parking rate of 0.15 space per unit is proposed, in comparison to the Zoning By-Law requirements of 0.20 space per unit. However, as outlined in **Section 10.0**, the reduced visitor parking supply is supportable based on proposed and approved visitor parking rates as well as surrogate site surveys within the surrounding area. In addition, the proposed visitor parking rate is consistent with the visitor parking requirement recommended by City staff along the Hazel McCallion LRT corridor. Furthermore, the Subject Site's proximity to transit will provide an alternative to driving for visitors.

It is also noted that an auxiliary turn-lane is not proposed at either of the proposed Site Accesses. As the removal of the on-street parking along John Street would be required to support an auxiliary turn-lane, the Subject Development is not expected to impact the on-street parking supply. Overall, the on-street parking supply and conditions for existing residents are expected to remain unchanged following the build out of the Proposed Development.

14.0 Conclusions and Recommendations (UPDATED)

This study has assessed the transportation impacts of the Proposed Development at 69 & 117 John Street in the City of Mississauga. The existing conditions, the future conditions, and the potential net impacts of the development proposal on the study road network have been evaluated. In addition, the study has assessed the development proposal for its ability to facilitate access, maneuverability, and parking of the expected vehicle servicing within the site.

A number of conclusions have been identified as a result of the study process. Furthermore, given these conclusions, several transportation planning recommendations have been produced for the consideration of the relevant reviewing agencies. These include recommendations related to the overall scope considered within this study, in addition to the recommendations specific to supporting the development proposal from a transportation operations and safety perspective.

Appendix R includes the Certification Form.

14.1 Conclusions

The analysis contained within this study has resulted in the following key findings:

- Under 2024 existing conditions, the study road network is operating at a LOS "C" or better. The study intersections are currently operating efficiently with reserve capacity to accommodate future traffic growth.

- Under 2029 future background conditions, traffic operations at the study intersections along Hurontario Street worsened in comparison to current traffic operations, while the remaining study intersections are forecast to operate similarly compared to existing conditions.

  - The Hazel McCallion LRT will result in increased delays due to the travel lane reduction, and northbound and southbound protect left-turn phases. The operations observed at Hurontario Street & John Street/Cooksville GO and Hurontario Street & Hillcrest Avenue & Kirwin Avenue are typical for transit corridors with protected left-turn phases. Moreover, the Ontario Ministry of Transportation's Transit Supportive Guidelines (2012) online that congestion can motivate commuters to shift from automobile to sustainable modes and is acceptable for transit corridors.

  - Furthermore, the volumes used herein can be considered conservative as historic counts were used and may not fully account for the modal split impacts of the Hazel McCallion LRT.

  - A LOS "F" and "E" during the weekday a.m. and p.m. peak hours, respectively. Intersection volume-to-capacity ratios above the City's critical threshold of 0.85 are also projected at the optimized signalized intersection of Hurontario Street & John Street/Cooksville GO during the weekday a.m. and p.m. peak hours. The eastbound left-turn and southbound left-turn movements are also forecast to experience high delays, volume-to-capacity ratios, and/or 95th percentile queues.

    - It is noted that the City can consider updating the east approach lane configuration to include exclusive left, through and right lanes instead of the planned exclusive left and through lane and shared through-right lane to accommodate the high number of westbound right-turn volumes projected. This lane configuration is expected to result in improved overall conditions during the weekday a.m. and p.m. peak hours, with a LOS "E" or better during the weekday a.m. peak hours. However, it is anticipated that intersection performance in practical conditions will be similar for both potential configurations.

  - At the optimized signalized intersection of Hurontario Street & Hillcrest Avenue/Kirwin Avenue, the intersection is expected to operate with a LOS "F" and "E" during the weekday a.m. and p.m. peak hours, respectively, with intersection volume-to-capacity ratios above 0.85. The eastbound left-turn and southbound left-turn movements are also expected to operate with high delays, volume-to-capacity ratios and/or 95th percentile queues. However, these conditions are typical of high volume urban areas during the GTHA, including the Hurontario Street corridor.

  - At the optimized signalized intersection of Dundas Street East & Kirwin Avenue/Camilla Road, a LOS "C" or better is forecast for the weekday peak hour periods. It is noted that the southbound left-turn movement 95th percentile queue exceeds the designated storage lane.

    - The City should monitor traffic volumes and queues post- Hazel McCallion LRT and post-Dundas BRT to determine if improvements for the southbound left-turn movement at Dundas Street East & Kirwin Avenue/Camilla Road are required. Should improvements be required, the City can consider adjusting the pavement markings, including on-street parking on the east, to extend the southbound left-turn lane storage.

  - The remaining study intersections are forecast to operate at a LOS "B" or better, with no delay, volume-to-capacity or queuing issues expected during the a.m. and p.m. peak hours.

- The proposed mixed-use development is expected to generate 886 and 804 total two-way external person trips during the weekday a.m. and p.m. peak hours, respectively. Of these person trips, 470 and 427 two-way external auto trips are generated during the weekday a.m. and p.m. peak hours, respectively.

  - In comparison to the previous submission (Crozier, April 2024), the most recent Development Proposal generated a maximum of 11 additional two-way vehicle trips during the weekday a.m. and p.m. peak hours. As this increase is not significant from a traffic operations perspective, the previous operations and analysis were maintained.

- Under 2029 future total conditions, the overall study road network traffic operations are projected to be similar to those forecast for 2029 future background conditions.

  - As outlined for future background conditions, the City can consider updating the east approach lane configuration to include exclusive left, through and right lanes instead of the planned exclusive left and through lane and shared through-right lane to accommodate the high number of westbound right-turn volumes projected.

- With an exclusive westbound right-turn lane, the intersection of Hurontario Street & John Street/Cooksville GO is expected to operate at an unchanged LOS "E" or better during the weekday a.m. and p.m. peak hours in comparison to future background conditions. Furthermore, the intersection control delay and volume-to-capacity ratio is expected to increase by a maximum of 14 seconds and 0.08, respectively. Consistent with future background conditions, operational concerns with some movements, including the eastbound left-turn southbound left-turn movements, are expected, with LOS "F", volume-to-capacity ratios above 1.0 and/or queue exceedances.

- Hurontario Street & Hillcrest Avenue/Kirwin Avenue is expected to operate at an unchanged LOS "F" and "E" during the weekday a.m. and p.m. peak hours, respectively, in comparison to future background conditions. A maximum increase of 19 seconds in intersection control delay and 0.05 in intersection volume-to-capacity ratio is also expected. Some movements are also expected to operate with a LOS "F", volume-to-capacity ratios above 1.0 and/or extended queues, however, this is consistent with future background conditions.

- The optimized signalized intersection of Dundas Street East & Kirwin Avenue/Camilla Road is expected to operate with an unchanged LOS "C" during the weekday a.m. and p.m. peak hours when compared to future background conditions. The intersection is expected to operate with an increase in control delay of 6 seconds and an increase in volume-to-capacity ratio of 0.06. Consistent with future background conditions, some movements are expected to have some operational concerns, including the southbound left-turn movement where the 95th percentile queue exceeds the provided storage.

  - The City should continue to monitor traffic volumes and queues post-Hazel McCallion LRT and post-Dundas BRT to determine if improvements for the Dundas Street East & Kirwin Avenue/Camilla Road southbound left-turn movement are required. Should improvements be required, the City can consider implementing an alternate optimized signal timing plan for the a.m. peak hour, which allocates additional green time to the minor approaches, as well as the previously recommended storage length extension.

- The remaining study intersections are expected to efficiently operate at an unchanged LOS "B" or better when compared to future background conditions, with no delay, capacity, or queueing concerns.

  - The most recent Site Plan included two (2) site accesses off John Street, west of the John Street & Little John Lane intersections. Both proposed site accesses are expected to operate efficiently without any operational or queueing concerns.

- Overall, the Subject Development does not materially impact the traffic operations at any of the study intersections. Moreover, the operational issues observed under future total conditions is consistent with future background conditions. As such, the Subject Development is supportable from a transportation operations perspective and no further improvements, beyond those outlined below, are required.

   - The signal warrants for the unsignalized intersections, including the two (2) proposed Site Accesses off John Street, were found to be not warranted, indicating that a stop controlled intersection is appropriate for these intersections.

   - The AWSC warrant at John Street & Little John Lane was found to be warranted, indicating that that AWSC is appropriate for this intersection based on the expected vehicle and pedestrian traffic volumes.

- Analysis of site access safety components associated with the Proposed Development indicates the following:

   - The available sight distance at the proposed outbound access (West Site Access) exceeds the minimum requirements set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) (June 2017).

   - The proposed access spacing, and corner clearance exceeds the recommended minimum intersection spacing and corner clearance guidelines outlined in TAC GDGCR.

- There are no expected vehicle maneuverability constraints within the Subject Site for waste collection vehicles, fire trucks, delivery trucks and passenger vehicles.

- The Site Plan proposes pedestrian facilities that support safe pedestrian circulation throughout the Subject Site and connect to the existing external pedestrian network.

- Per the City of Mississauga Zoning By-Law 0225-2007, the Subject Development is required to provide 1,342 vehicle parking spaces. As the 822 parking spaces are proposed, a parking deficit is proposed.

   - The City's existing parking rates would likely be an overestimation of expected parking demand for the Proposed Development, especially considering the Subject Site is situated in the Cooksville GO Protected Major Transit Station Area, with direct access to higher order transit.

   - In addition, City staff has recommended that a reduced parking requirement of 0.50 space per unit and 0.15 space per unit for residents and visitors, respectively, be implemented for residential uses along the Hurontario LRT corridor. The proposed parking rate of 0.61 space per unit only results in a minor deficiency.

   - As part of Bill 185, the Province recently removed the minimum parking rates for all new developments, except Universities, within PMTSAs. As the Subject Site is located within the Cooksville GO PMTSA, the minimum parking requirement for the Subject Development is zero (0) spaces. As the development proposes 822 parking spaces, the proposed parking supply satisfies this minimum requirement. Accordingly, the proposed parking rate is acceptable.

   - Furthermore, the proposed parking rate of 0.50 space per unit and 0.11 space per unit for residents and visitors, respectively, is expected to be sufficient when considering the proposed and approved parking rates as well as surrogate site surveys for developments in similar transportation contexts.

- Based on the visitor parking requirements, a minimum of eight (8) accessible parking spaces are required. As the Site Plan proposes 18 accessible parking spaces, the Zoning By-Law accessible parking requirements are exceeded.

- To support the Proposed Development, a total of 804 Class A and 69 Class B bicycle parking spaces are required. The Site Plan proposes 860 bicycle parking spaces, comprised of 790 Class A and 70 Class B spaces, thus, the Zoning By-Law bicycle parking requirements are exceeded.

- Per the City of Mississauga Zoning By-Law 0225-2007, four (4) loading spaces are required to support the Subject Development. As one (1) official loading space is provided, a deficit is proposed.

    - A PUDO/loading zone is also proposed on the north end of the drive aisle, immediately south of Building B. This area can also be used for move-ins and deliveries, as needed.

    - The demand of the loading space and PUDO/loading zone will be managed via a booking system. This will ensure that the loading space and PUDO/loading zone is available when required for waste collection, and residential and commercial tenants can arrange move-ins and/or deliveries at alternate times on a first-come, first-serve basis.

    - While the PUDO/loading zone does not meet the City's loading space dimension requirements, it can sufficiently accommodate two (2) MSU trucks or four (4) passenger cars are one time. Despite the dimensions of this zone being technically deficient, functionally the PUDO/loading zone is sufficient to address the Subject Development's needs.

    - Smaller delivery vehicles that typically do not utilize a loading space are expected to use the additional lay-by parking spaces on-site.

- The recommended TDM measures, outlined in **Table C1**, results in a 5 Star rating per the City's Transportation Demand Management and Pedestrian Circulation Checklist. These recommendations align with the Subject Development being a TOD.

14.2 Recommendations

Table C1 outlines the recommendations resulting from the conclusions and findings of this study.

Table C1: Recommended Improvements Summary

Intersection	Improvement	Responsibility
2029 Future Background		
Hurontario Street & John Street/Cooksville GO	Consider implementing an exclusive westbound right-turn movement, instead of a shared westbound through-right-turn movement. Optimize signal timing plan. Consider updating the Hazel McCallion LRT design drawings and revise the planned pavement markings to extend the southbound left-turn lane storage length to at least 65 metres.	City
Hurontario Street & Hillcrest Avenue/Kirwin Avenue	Optimize signal timing plan. Consider updating the Hazel McCallion LRT design drawings and revise the planned pavement markings to maximize the southbound left-turn lane storage length.	City
Dundas Street East & Kirwin Avenue/Camilla Road	Optimize signal timing plan. Monitor traffic volumes post- Hazel McCallion LRT and post-Dundas BRT to determine if improvements are required, including: • Adjust pavement markings, including the start of on-street parking on the east side, to extend the southbound left-turn lane storage.	City
2029 Future Total		
Hurontario Street & John Street/Cooksville GO	Consider revising the planned pavement markings to maximize the southbound left-turn lane storage length. Consider providing westbound left-turn lane storage length of at least 65 metres.	City/Developer

Intersection	Improvement	Responsibility
Dundas Street East & Kirwin Avenue/Camilla Road	Continue to monitor traffic volumes post-Hazel McCallion LRT and post-Dundas BRT to determine improvements are required, including: • Adjust pavement markings, including the start of on-street parking on the east side, to extend the southbound left-turn lane storage. • Adjust the signal timing plans (Signal Optimized #2) for the weekday a.m. peak period to increase the green time for the southbound left-turn and/or minor approach movements,	City
John Street & Little John Lane	Implement AWSC.	Developer
Proposed Development	Implement the following site safety measures: • Convex mirrors within parking and loading areas. • Vehicle warning system with lights at the loading entrances and parking exits. Implement the following TDM strategies: • TDM Information Package for New Tenants • TDM Coordinator • Smart Commute Membership • Wayfinding Signage • Flex Workspace Amenity Spaces • Pick-up/Drop-off Area(s) • Subsidized Transit Passes • Real-Time Transit Information Screens • Secure & Excess Bicycle Parking Spaces • Bicycle Repair Station • Reduced Parking Supply • Unbundled Parking • Carshare Spaces	Developer

The analysis contained within this report was prepared using the Site Plan prepared by Tregebov Cogan Architecture. Any minor revisions to the Site Plan are not expected to affect the conclusions contained with this report.

In conclusion, the Proposed Development can be supported from a transportation operation, parking, loading, site circulation and safety perspective.

Respectfully submitted by,

C.F. CROZIER & ASSOCIATES INC.

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Senior Project Manager, Transportation

C.F. CROZIER & ASSOCIATES INC.

My-Linh Yee, EIT
Engineering Intern, Transportation

/MY/ah/mi/kh

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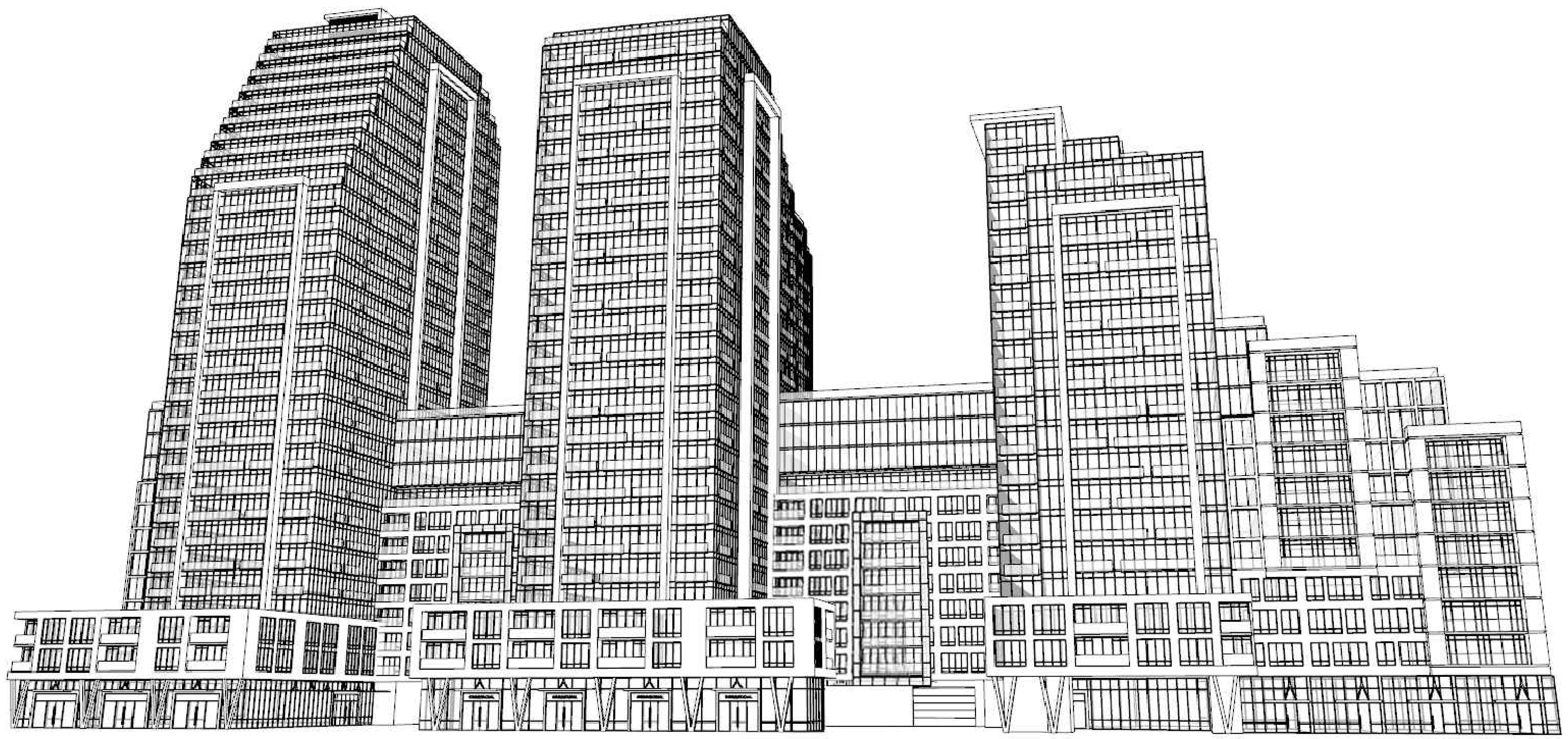
APPENDIX A:

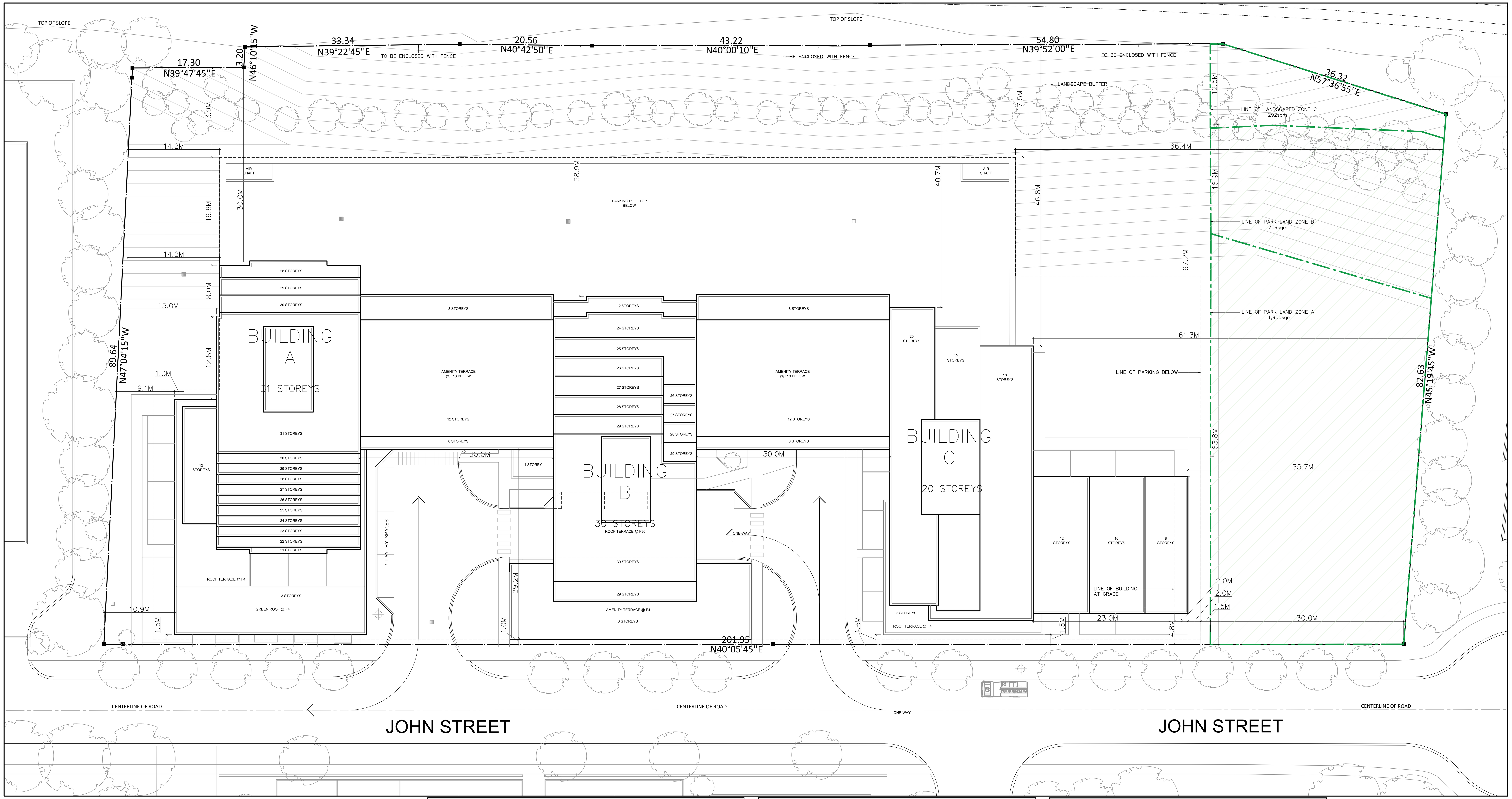
Site Plan



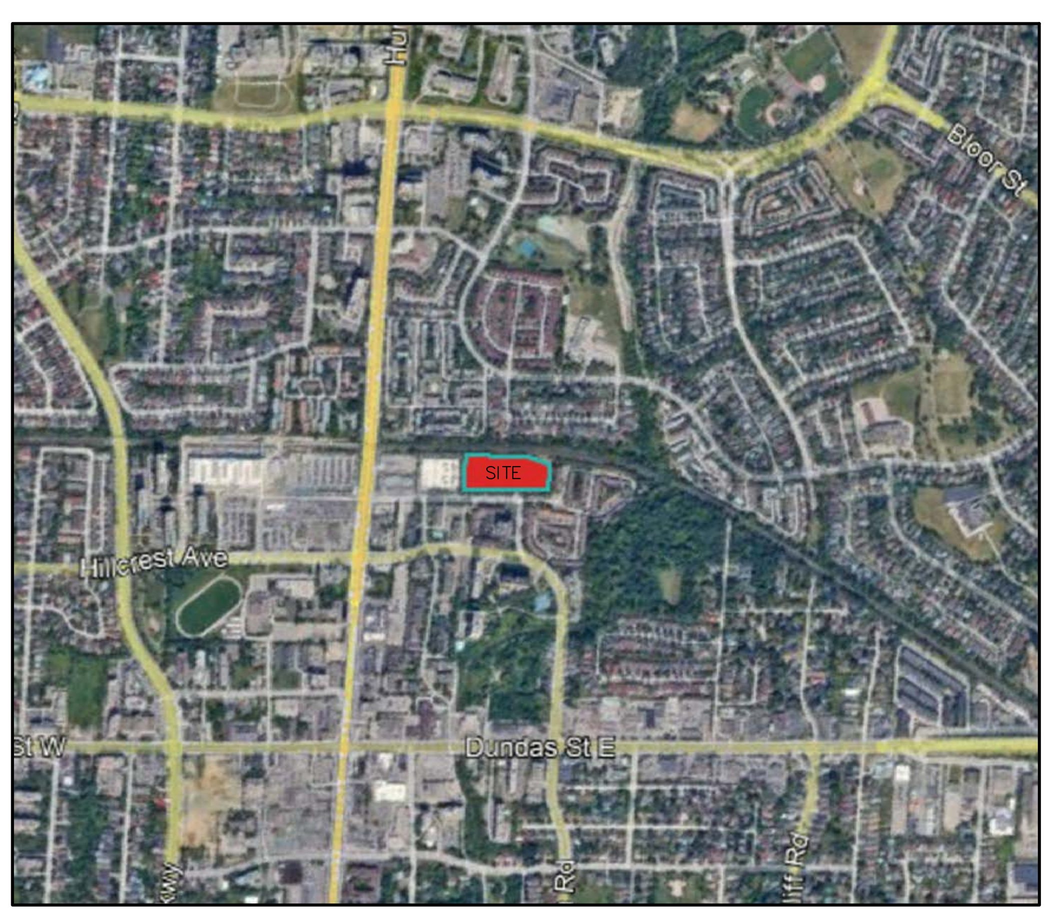
69 & 117 JOHN STREET, MISSISSAUGA, ON

PROPOSED DEVELOPMENT PLANS

PRINT DATE : SEPTEMBER 11, 2024



3 SITE PLAN
Scale: 1:300



2 CONTEXT PLAN
Scale: 1:5000

LEGAL DESCRIPTION

PART OF LOT 15 CONCESSION 1. NORTH OF DUNDAS STREET
(GEOGRAPHIC TOWNSHIP OF TORONTO)

CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL

SITE DATA

LOT AREA 18,685 sq.m (1.87 hectare)
BUILDING AREA (GROUND FLOOR) 7,036 sq.m (38% of LOT AREA)
GROSS FLOOR AREA 100,379 sq.m
FLOOR SPACE INDEX (F.S.I) 5.37

FLOOR AREAS AND SUITES

TYPE	ARES (m^2)				
COMMERCIAL	600				
	ARES (m^2)	1 BEDROOM	2 BEDROOM	3 BEDROOM	TOTAL UNITS
PODIUM (F1-F12)	60,811	529	90	60	679
TOWER A	16,858	191	56	0	247
TOWER B	16,333	191	35	0	226
TOWER C	6,938	180	10	0	190
TOTAL	100,379	1,091	191	60	1,342

NOTES:
3.5% OF TOTAL UNITS DEDICATED TO RENTAL TENANCY AND *7%* OF TOTAL UNITS DEDICATED TO AFFORDABLE HOUSING
FLOOR AREAS REFLECT 1,000 sq.m FLOOR PLATES FOR TOWERS
FLOOR AREAS DO NOT EXCLUDE CIRCULATION SPACE

MIN. SUITE AREA 50 sq.m
AVERAGE AREA/SUITE (net) 63 sq.m
UNITS PER HECTARE (U.P.H) 717

LAND USE AT GRADE

PAVED AREA	2,130 sq.m	11%
LANDSCAPED AREA	6,860 sq.m	37%
PARK LAND	2,659 sq.m	14%
AREA OF BLDG. AT GRADE	7,036 sq.m	38%
	18,685 sq.m	**100%**

SETBACKS

PROVIDED

SOUTH SIDE (JOHN STREET) VARIES 1.0 m – 30.2 m
WEST SIDE VARIES 9.1 m – 15.0 m
NORTH SIDE (C.P.R RAILWAY) VARIES 30.0 m – 67.2 m
EAST SIDE VARIES 35.7 m – 66.4 m

BUILDING HEIGHTS

TOWER A HEIGHT TO TOP OF FLAT ROOF 100 m
(TAKEN FROM ESTABLISHED GRADE LINE)

TOWER B HEIGHT TO TOP OF FLAT ROOF 97 m
(TAKEN FROM ESTABLISHED GRADE LINE)

TOWER C HEIGHT TO TOP OF FLAT ROOF 65 m
(TAKEN FROM ESTABLISHED GRADE LINE)

PARKING

REQUIRED

TYPE OF UNIT	NO. OF UNITS	PARKING RATIO	PARKING REQUIRED
1 BEDROOM	1,091	0.50	546
2 BEDROOM	191	0.50	95
3 BEDROOM	60	0.50	30
TOTAL RESIDENTIAL PARKING			**671**
VISITOR PARKING	1,342	0.11	148
TOTAL PARKING REQUIRED			**819**

PROVIDED

PARKING LEVEL	NEW RATIO PARKING SPACES
SURFACE	7
P+1 LEVEL	116
P+2 LEVEL	114
P1 LEVEL	282
P2 LEVEL	303
TOTAL	**822**

PARKING SPACE TYPICAL DIMENSIONS: 2.6 m X 5.7 m
BARRIER-FREE: 4.5 m X 5.7 m
DRIVEWAY: 7.00 m MIN. WIDTH

NOTES:
INCLUDES 18 BARRIER-FREE PARKING SPACES, 651 RESIDENTIAL SPACES AND 153 VISITOR SPACES
SURFACE LEVEL PARKING ARE SHORT-TERM VISITOR PARKING SPACES
PARKING RATIOS ARE BASED ON NEW REQUIREMENTS OF MISSISSAUGA CITY COUNCIL
INCLUDES 174 (20% OF REQ.) RESIDENTIAL EV SPACES AND 20 (10% OF REQ.) VISITOR EV SPACES

BICYCLE PARKING PROVIDED

SURFACE LEVEL 70 SPACES
BASEMENT LEVELS 807 SPACES
TOTAL ON SITE 877 SPACES

NOTES:
SURFACE LEVEL SPOTS ARE SHORT-TERM VISITOR SPACES

AMENITY SPACE

OUTDOOR REAR YARD (ON GRADE) 4,477 sq.m
PROVIDED SHARED OUTDOOR AMENITY (AT FLOORS 4 AND 13) 1,295 sq.m
INDOOR AMENITY (TOTAL OF FLOORS 4 AND 13) 1,531 sq.m
TOTAL 7,303 sq.m

NOTES:
OUTDOOR REAR YARD AMENITY SPACE EXCLUDES PRIVATE PATIOS AND RAILWAY BERM AREAS

LANDSCAPE AREAS

LANDSCAPE AREA (ON GRADE) 6,860 sq.m
OUTDOOR AMENITY (TOTAL OF FLOORS 4 AND 13) 1,531 sq.m
TOTAL 8,391 sq.m

NOTES:
OUTDOOR REAR YARD AMENITY SPACE EXCLUDES PRIVATE PATIOS AND RAILWAY BERM AREAS
DOES NOT INCLUDE ANY PART OF PARKLAND ZONES 'A' AND 'B'

1 STATISTICS

CONSULTANTS:

DATE	No.	ISSUE
2024-09-11	01	FOR COORDINATION

ARCHITECT:
TREGEBOV COGAN *ARCHITECT*
40 Saint Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:

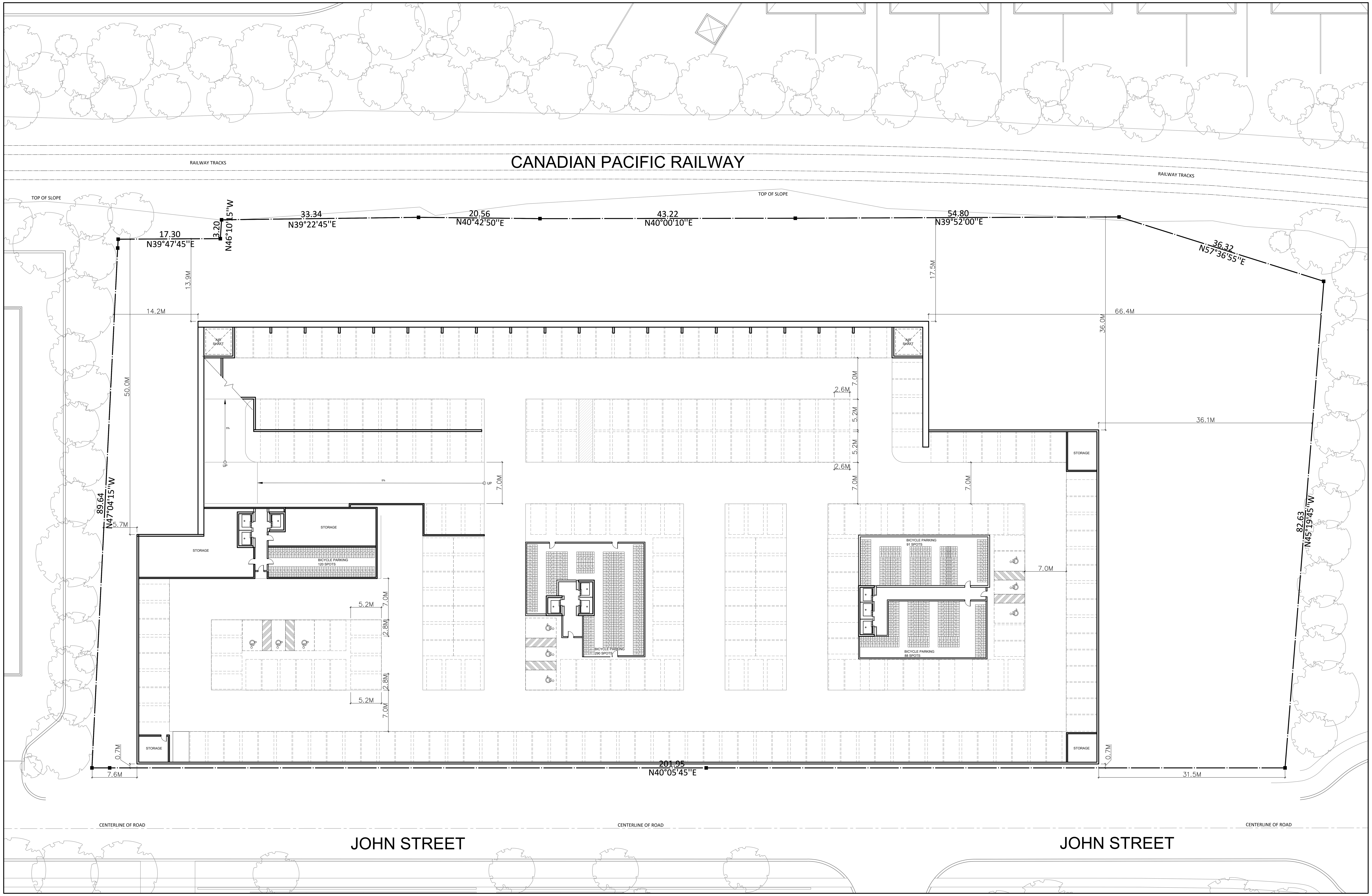
PROJECT NAME:
69 & 117 JOHN ST.
MISSISSAUGA

DRAWING TITLE:
SITE STATISTICS, CONTEXT PLAN AND ROOF PLAN

PRINT DATE: 11-SEPT 2024

NORTH

PROJ. No.: 1101
DEV APPLICATION NO:
SCALE: AS NOTED
DWG NO. **A1.0**
DRAWN BY: KT



1 PARKING PLAN - P2

1:300

CONSULTANTS:

DATE	No.	ISSUE
2024-09-11	01	FOR COORDINATION

ARCHITECT:

TREGEBOV COGAN *ARCHITECT*
40 Saint Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:

PROJECT NAME:

69 & 117 JOHN ST.
MISSISSAUGA

DRAWING TITLE:

P2 PARKING PLAN

PRINT DATE: 11-SEPT 2024

NORTH

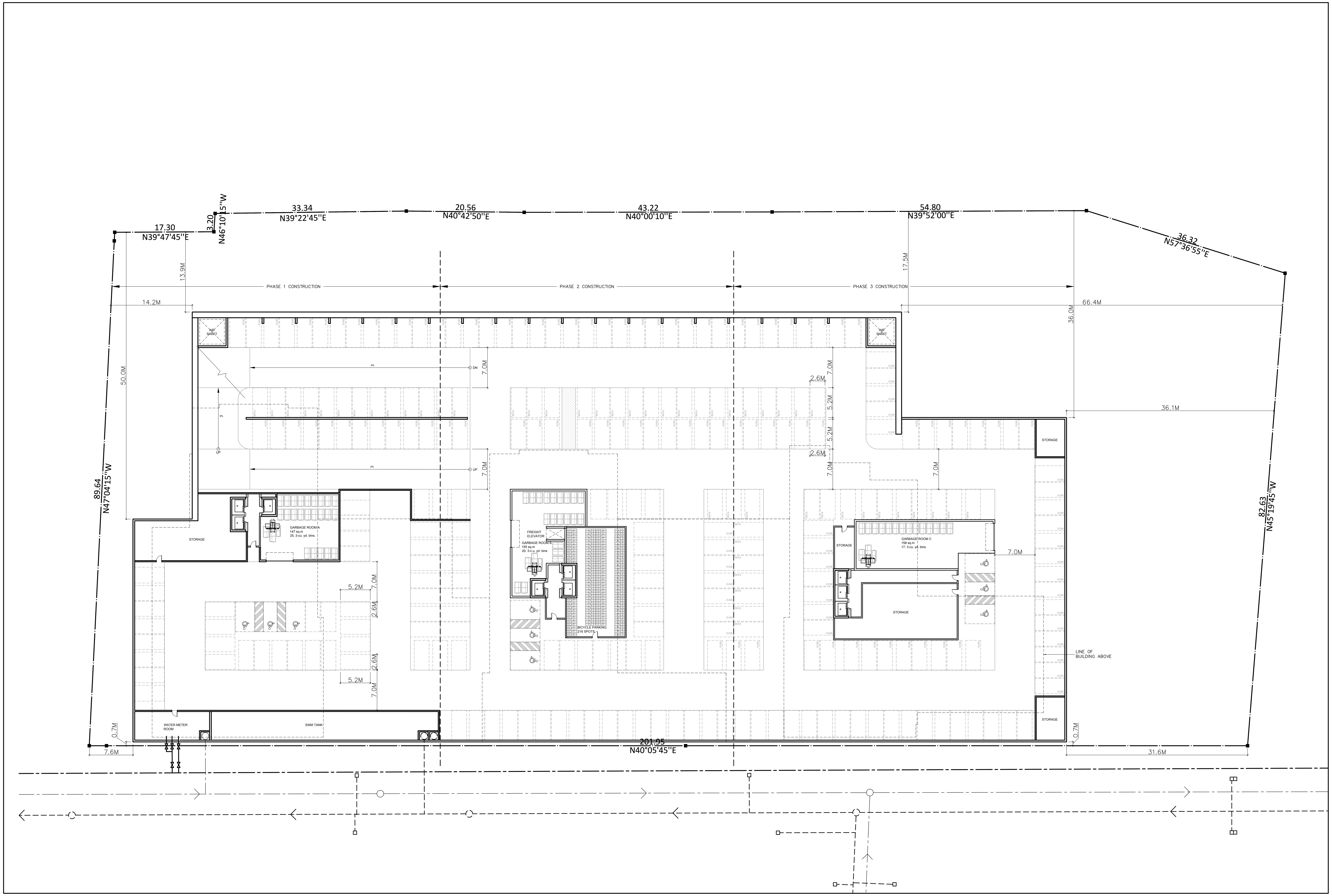
PROJ. No.: 1101

SCALE: AS NOTED

DRAWN BY: KT

DEV APPLICATION NO:

DWG NO. **A2.0**



1 PARKING PLAN - P1

1:300

CONSULTANTS:

DATE	No.	ISSUE
2024-09-11	01	FOR COORDINATION

ARCHITECT:

TREGEBOV COGAN *ARCHITECT*

40 Saint Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:

PROJECT NAME:

69 & 117 JOHN ST.
MISSISSAUGA

DRAWING TITLE:

P1 - PARKING PLAN

PRINT DATE: 11-SEPT 2024

NORTH

PROJ. No.: 1101

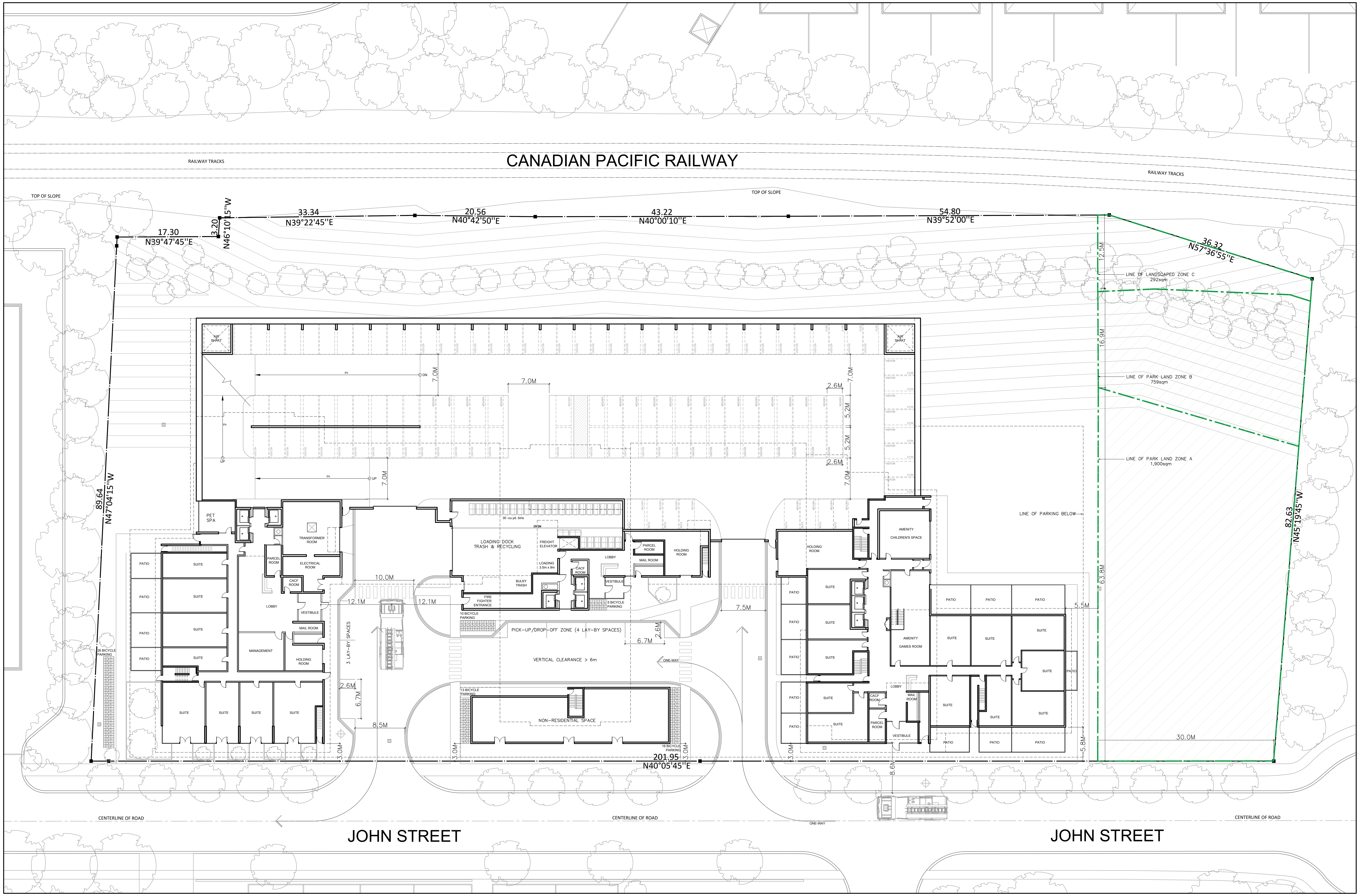
DEV APPLICATION NO:

SCALE: AS NOTED

DWG NO.

A2.1

DRAWN BY: KT



1 F1/SITE PLAN
1:300

CONSULTANTS:

DATE	No.	ISSUE
2024-09-11	01	FOR COORDINATION

ARCHITECT:

TREGEBOV COGAN *ARCHITECT*

40 Saint Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:

PROJECT NAME:

69 & 117 JOHN ST.
MISSISSAUGA

DRAWING TITLE:

F1/SITE PLAN

PRINT DATE: 11-SEPT 2024

NORTH

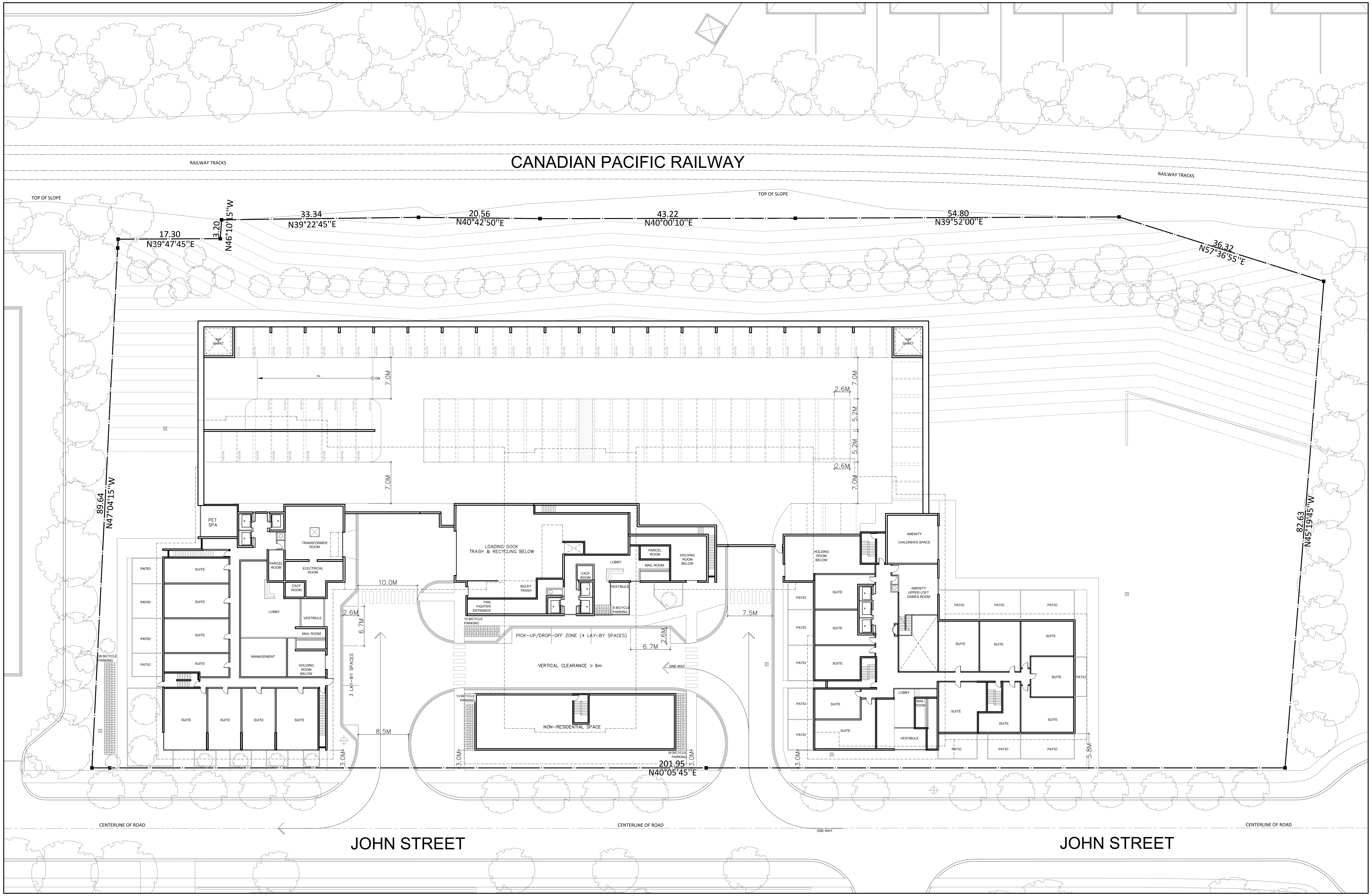
PROJ. No.: 1101

DEV APPLICATION NO:

SCALE: AS NOTED

DWG NO. **A2.2**

DRAWN BY: KT



1 F1a FLOOR PLAN
1:300

CONSULTANTS:

DATE	No.	ISSUE
2024-09-11	01	FOR COORDINATION

ARCHITECT:
TREGEBOV COGAN *ARCHITECT*
40 Saint Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:

PROJECT NAME:
69 & 117 JOHN ST.
MISSISSAUGA

DRAWING TITLE:
F1a FLOOR PLAN

PRINT DATE: 11-SEPT 2024

NORTH

PROJ. No.: 1101
DEV APPLICATION NO:
SCALE: AS NOTED
DWG NO. **A2.3**
DRAWN BY: KT

APPENDIX B:

Correspondence

My-Linh Yee

From:	Michael Turco <Michael.Turco@mississauga.ca>
Sent:	February 13, 2024 10:19 AM
To:	My-Linh Yee
Cc:	Michael Linton; Kierra Harper; Cyrus Hiranandani
Subject:	RE: 69 & 117 John Street - Terms of Reference

Hi My-Linh,

The proposal at 3065 Jaguar Valley Drive is to convert an existing apartment building site into a standard condominium. Thus, only a change in tenure is proposed and there is no need to consider this site as a background development.

Thank you,

Michael Turco, C.E.T., CPT, MITE
Traffic Planning Coordinator
T 905-615-3200 ext. 3597
michael.turco@mississauga.ca

City of Mississauga | Transportation & Works Department
300 City Centre Drive | Mississauga ON | L5B 3C1

From: My-Linh Yee <myee@cfcrozier.ca>
Sent: Tuesday, February 13, 2024 10:15 AM
To: Michael Turco <Michael.Turco@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; Kierra Harper <kharper@cfcrozier.ca>; Cyrus Hiranandani <Cyrus.Hiranandani@mississauga.ca>
Subject: FW: 69 & 117 John Street - Terms of Reference

Hi Michael,

I tried to reach out to Cyrus but got his out of office email. Are you able to provide us the transportation reports for 3065 Jaguar Valley Drive?

Thanks,
My-Linh

My-Linh Yee, EIT
Engineering Intern, Transportation
Office: 905.876.7159
Collingwood | Milton | Toronto | Bradford | Guelph

From: My-Linh Yee <myee@cfcrozier.ca>
Sent: Tuesday, February 13, 2024 10:10 AM
To: Cyrus Hiranandani <Cyrus.Hiranandani@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; Kierra Harper <kharper@cfcrozier.ca>; Trans Projects <Trans.Projects@mississauga.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Hi Cyrus,

I hope you are doing well. Can you provide the Transportation Impact Study for 3065 Jaguar Valley Drive background development, as we have not been able to find it on the City's website.

Thanks,
My-Linh

My-Linh Yee, EIT
Engineering Intern, Transportation
Office: 905.876.7159
Collingwood | Milton | Toronto | Bradford | Guelph

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From: Cyrus Hiranandani <Cyrus.Hiranandani@mississauga.ca>
Sent: Tuesday, January 23, 2024 11:36 AM
To: My-Linh Yee <myee@cfcrozier.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; Kierra Harper <kharper@cfcrozier.ca>; Trans Projects <Trans.Projects@mississauga.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Good Morning My-Linh,

Please find attached stamped and approved ToR for the proposed development, which encompasses City comments. Other items to note:

- Certification Form - The Transportation Consultant must complete, sign, and seal (if appropriate) the attached Certification Form from the City's TIS Guidelines (2022) and submit the document with the application/report to ensure compliance with qualification requirements. The TIS Guidelines can be found at https://www.mississauga.ca/wp-content/uploads/2023/03/CMississauga-TIS-Guidelines-Version-5.1-Dec-2022.pdf . It must be ensured that the report conforms to the City's TIS Guidelines.
- Growth Rates/Traffic Data - Please contact Tyler Xuereb from the City's Transportation Planning Section (tyler.xuereb@mississauga.ca, Ext. 4783) to confirm growth rates and/or obtain traffic data for the study area roadways.
- Signal Timing Plans - Signal timing plans for signalized intersections under the City's jurisdiction can be obtained from Jim Kartsomanis (Jim.Kartsomanis@mississauga.ca, Ext. 3964).

Let me know if you have any questions.

Thank you,

Cyrus Hiranandani, E.I.T.
Traffic Planning Technologist
T 905-615-3200 ext. 4363
cyrus.hiranandani@mississauga.ca

City of Mississauga | Transportation & Works Department
300 City Centre Drive | Mississauga ON | L5B 3C1

From: My-Linh Yee <myee@cfcrozier.ca>
Sent: Monday, January 8, 2024 5:06 PM
To: Kate Vassilyev <Kate.Vassilyev@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; Kierra Harper <kharper@cfcrozier.ca>; Michael Turco <Michael.Turco@mississauga.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Hi Kate,

I hope you are doing well. Crozier is retained to prepare a Transportation Study in support of the Official Plan Amendment and Zoning By-Law Amendment for the proposed mixed-use residential commercial development at 69 & 117 John Street. The most recent concept plan (see attached) proposes 1,309 residential units and 700 m^2 of retail space. It is noted the concept plan is subject to change.

Based on the updated DARC (DARC 23-146 W7) conducted in September 2023 and discussions with the City in December 2023, we are proposing the following updated Terms of Reference for the Transportation Study. Please note, the completed Pre-Study Consultation Checklist is also attached in addition to the below Terms of Reference.

Study Intersections

- Hurontario Street & John Street
- Hurontario Street & Kirwin Avenue
- John Street & Little John Lane
- Kirwin Avenue & Little John Lane
- John Street & Jaguar Valley Drive
- Dundas Street & Kirwin Avenue
- Kirwin Avenue & Jaguar Valley Drive
- Hillcrest Avenue & GO Access Road
- Site Access(es)

Existing Conditions

- Analyze the existing automobile conditions based on peak hour traffic counts using Synchro Version 11.0, LOS (based on control delays), maximum volume-to-capacity ratios and queue length will be evaluated based on HCM 2000 standards.
- Weekday a.m. and p.m. peak periods; 7:00 a.m. to 10:00 a.m. & 4:00 p.m. to 7:00 p.m.; reflective of the typical commuter peak period.
- We have reached out to tyler.xuereb@mississauga.ca regarding Turning Movement Counts (TMCs) and have been informed the following TMCs are available:
  - Hurontario Street at John Street - 2015
  - Hurontario at Kirwin Avenue – 2016
  - Hillcrest Avenue & GO Access Road – 2015
- In addition, TMCs have been previously conducted in 2023 for the following intersections:
  - Dundas Street & Kirwin Avenue
  - John Street & Jaguar Valley Drive
  - Kirwin Avenue & Jaguar Valley Drive
  - Kirwin Avenue at Little John Lane
  - John Street at Little John Lane
- Many of the above TMCs from the City are quite outdated and we would like to propose conducting new counts at the study intersections where possible. However, we do note that there has been construction activity which may impact travel patterns and as such the study may have to rely on the use of this historical data instead of new counts.
- We have reached out to Steve.Gee@mississauga.ca for signal timing data.

Study Horizon

- We propose a 2023 existing base year and a 2028 study horizon, consistent with the City's Traffic Impact Study Guidelines.

Growth Rates

- We will reach out to Tyler Xuereb from Transportation Planning (tyler.xuereb@mississauga.ca) to confirm the appropriate growth rates for the study road network.

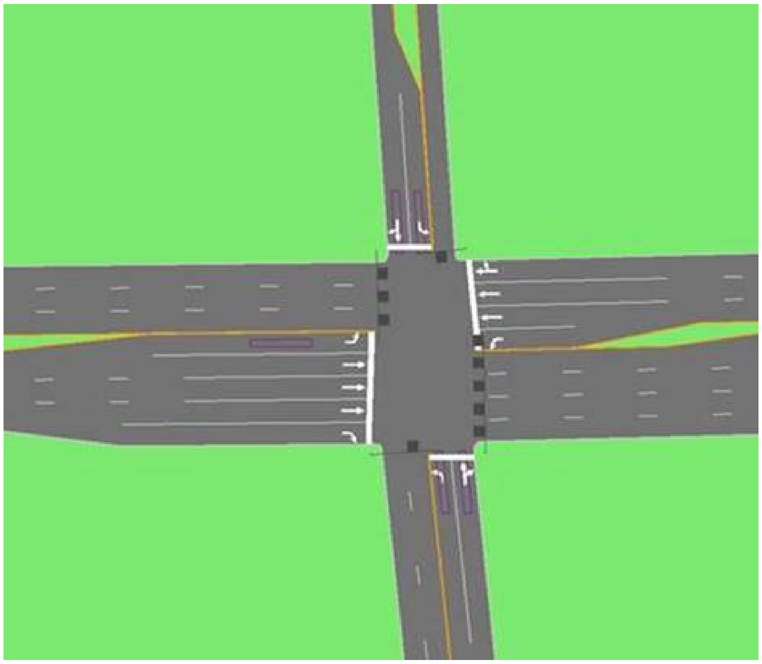
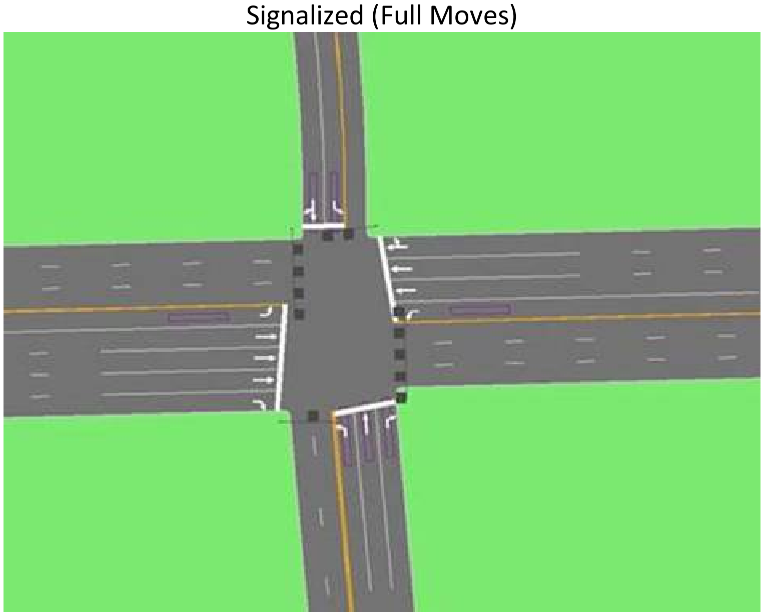
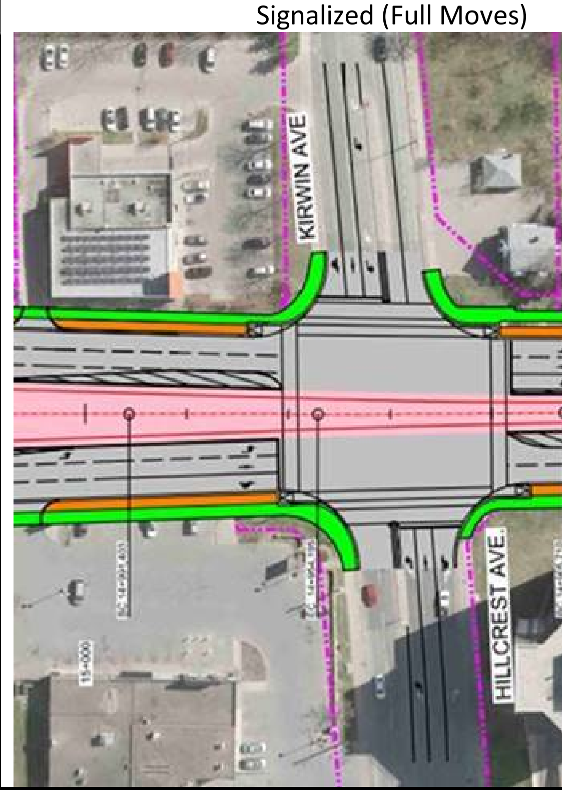
Background Developments

- We will include the following background developments in our analysis:
  - 0 Kings Street E, 0 Camilla Road & 2487 Camilla Road
  - 25 & 33 Hillcrest Avenue, 3146 & 3154 & 3168 Hurontario Street
  - 60 Dundas Street East
  - 65-71 Agnes Street
  - 3016 & 3020 & 3026 & 3032 Kirwin Avenue, 3031 Little John Lane
  - 3085 Hurontario Street
  - 3420 & 3442 Hurontario Street

Hurontario LRT

- The existing (pre-LRT construction) and future intersection lane configurations that we have currently assumed based on a desktop review and the LRT Rollout Map (June 2017), respectively, are summarized below:

Intersection	Intersection Configuration	
	Existing – Pre LRT (Desktop Review)	Future – Post LRT (LRT Rollout Map – Ju
Hurontario Street at John Street	Signalized (Full Moves)	Signalized (Full Moves)

		
Hurontario Street at Kirwin Avenue	Signalized (Full Moves) 	Signalized (Full Moves) 

Background Traffic Volumes

- We will forecast the 2027 future background volumes based on the above growth rate and background developments.
- Future background volumes will be analyzed based on Synchro Version 11.0, LOS (based on control delays), maximum volume-to-capacity ratios and queue length will be evaluated based on HCM 2000 standards.

Future Conditions

- Trip Generation will be based on ITE Trip Generation Manual, 11th edition and First Principles (via existing or forecasted mode split data).
  - We will also review the multi-modal trip generation as well as the anticipated number of GO, LRT, and local bus passengers from the Proposed Development.
- Trip Distribution will be based on Transportation Tomorrow Survey (TTS) data and/or forecasted travel patterns.
- Future background and future total automobile conditions will be compared to identify if capacity and queuing issues are forecasted and if mitigation measures are required.

Traffic Safety
- The available site distance at the proposed site access will be compared to standards set out by the Transportation Associates of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR).
- The site access will also be reviewed to confirm it conforms to TAC standards.
- The supportability of site access locations and restrictions will be reviewed based on traffic operations and expected queue lengths, as well as applicable access spacing guidelines.
- A Pedestrian Circulation Plan will be prepared per the City of Mississauga's Transportation Impact Study Guidelines.
- Conflicts will be reviewed between vehicles, pedestrians, cyclists, and recommendations made to maintain multimodal safety.

TDM Review
- Transportation Demand Management (TDM) opportunities will be assessed, and site-specific measures for the development will be recommended to reduce single-occupancy vehicle (SOV) trips and promote sustainable transportation in line with the City and Region's mode share targets and vision for the Hurontario Street Corridor.

Parking
- As part of the TIA submission, a Parking Justification Study will also be included. The Parking Study Terms of Reference will be confirmed with parkingstudy.review@mississauga.ca

Loading
- Loading requirements will be reviewed per City of Mississauga Zoning By-Law 0174-2017. Any deviations will be supported with appropriate justification, if required.

Other
- Vehicle Turning Diagrams will be provided for the following design vehicles:
  - TAC p-car
  - Medium Single Unit Truck
  - Pumper Fire Truck
  - Region of Peel Typical Waste Collection Vehicle

Thanks,
My-Linh

My-Linh Yee, EIT
Engineering Intern, Transportation
Office: 905.876.7159
Collingwood | Milton | Toronto | Bradford | Guelph

From: Michael Turco <Michael.Turco@mississauga.ca> **On Behalf Of** Trans Projects
Sent: Thursday, December 21, 2023 8:46 AM
To: Kierra Harper <kharper@cfcrozier.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Good morning Kierra,

Thank you for your email. The TIS will be required to conform to the City's new TIS Guidelines, including the new process for Terms of References. Please complete and submit the Pre-Study Consultation Checklist (attached). The City will review and comment on the assumptions once the document is submitted.

Regards,

MISSISSAUGA

Michael Turco, C.E.T., CPT, MITE
Traffic Planning Coordinator
T 905-615-3200 ext. 3597
michael.turco@mississauga.ca

City of Mississauga | Transportation & Works Department
300 City Centre Drive | Mississauga ON | L5B 3C1

Please consider the environment before printing.

From: Kate Vassilyev <Kate.Vassilyev@mississauga.ca>
Sent: Wednesday, December 20, 2023 5:45 PM
To: Trans Projects <Trans.Projects@mississauga.ca>
Subject: FW: 69 & 117 John Street - Terms of Reference

From: Kierra Harper <kharper@cfcrozier.ca>
Sent: Wednesday, December 20, 2023 10:16 AM
To: Kate Vassilyev <Kate.Vassilyev@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>
Subject: 69 & 117 John Street - Terms of Reference

Good morning Kate,

I hope you are doing well. Crozier is retained to prepare a Transportation Impact Study for the proposed development at 69 & 117 John Street. An initial DARC (DARC 22-225 W7) was conducted in 2022, with an updated DARC (DARC 23-146 W7) conducted in September 2023. A Terms of Reference was previously circulated and confirmed with the City in February 2023 (see attached). We wanted to confirm if the City requires us to submit a new Terms of Reference or if the initial Terms of Reference will suffice. Can you also confirm if the study will now be required to conform to the City's updated TIS Guidelines which were released around March 2023? Note that the guidelines were released after the initial TOR coordination and would not have been referenced in the attached correspondence.

Should the initial Terms of Reference suffice, we will also include the following in our report based on the most recent DARC comments:

- Review the anticipated number of GO, LRT, and local bus (using street and/or Cooksville GO) passengers from the Proposed Development

- Include Hillcrest Avenue & GO Access Road as a study intersection.
- Access justification, if the proposed site access is not aligned with Little John Lane.

We will follow up with formal terms pending your response to the above.

Thank you,
Kierra
Reminder: Crozier offices will be closed for the Holidays beginning Friday, December 22
nd at 5:00pm, and re-opening Tuesday, January 2*nd* at 8:30am. All the best during the Holiday season!

Kierra Harper, EIT
Engineering Intern, Transportation
Office: 905.693.4713
Collingwood | Milton | Toronto | Bradford | Guelph

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Appendix B

APPROVED
By Cyrus Hiranandani at 11:30 am, Jan 23, 2024

Pre-Study Consultation Checklist

Description	Information	Section Reference
Development Information		
Development Description (land use, size, and number of phases of development)	• High Rise Apartment: 1,309 units (including 4 live/work units) • Retail: 700 m^2	2.3.6
Transportation Impact Assessment		
Step 1 – Screening		
Type of Application (attach a drawing)	☒ Official Plan Amendment ☒ Zoning Amendment ☐ Site Plan Control Application ☐ Plan of Subdivision ☐ Other___	2.3.5
Screening Criteria	☒ Trip Generation Trigger Satisfied ☒ Location Trigger Satisfied ☐ Operational/Safety Trigger Satisfied	2.2.1
Type of Study	☒ Transportation Impact Study ☒ Access Review ☐ No Additional Study Required	2.2.1
Step 2 – Scoping		
Study Area (intersections to be analyzed) Note: The Transportation Consultant is responsible to identify any further intersections impacted as the study progresses.	• Hurontario Street & John Street • Hurontario Street & Kirwin Avenue • John Street & Little John Lane • Kirwin Avenue & Little John Lane • John Street & Jaguar Valley Drive • Dundas Street & Kirwin Avenue • Kirwin Avenue & Jaguar Valley Drive • Hillcrest Avenue & GO Access Road • Site Access(es)	2.3.8
Horizon Years	☒ 5 years from date of TIS ☐ Interim years___ ☐ Other___	2.3.9

Description	Information	Section Reference
Analysis Periods	☒ AM weekday peak hour of adjacent roadway ☒ PM weekday peak hour of adjacent roadway ☐ Saturday peak hour of adjacent roadway ☐ AM weekday peak hour of development ☐ PM weekday peak hour of development ☐ Saturday peak hour of development ☐ Other ______________________________	2.3.10
Input Parameters and Assumptions (potential deviations)	• Existing Lane Configurations: Pre LRT construction per a desktop review of historical imagery. • Historic Signal Timing Plans: Received from City of Mississauga (Steve.Gee@mississauga.ca) • Future Lane Configurations: Post LRT conditions per the LRT Rollout Map (June 2017) received from the City of Mississauga.	2.3.13
Existing Transportation Conditions	☒ City data sources ☒ New data collection______________________ ☐ Other ______________________________	2.3.14
Planned Network Improvements (with timing)	• Hurontario Light Rail Transit (LRT) and Associated Lane Configurations: 2024	2.3.16
Other Planned Developments (per City's Website)	• 0 Kings Street E, 0 Camilla Road & 2487 Camilla Road • 25 & 33 Hillcrest Avenue, 3146 & 3154 & 3168 Hurontario Road • 60 Dundas Street E • 65-71 Agnes Street • 3016 & 3020 & 3026 & 3032 Kirwin Avenue, 3031 Little John Lane • 3085 Hurontario Street • 3420 & 3442 Hurontario Street • 3115 Hurontario Street • 3065 Jaguar Valley Drive • Any other in-stream or recently approved development within approximately 1km from the subject site. Refer to the City's website for further information	2.3.17
Identification of Mitigation Improvement Measures	☐ Neighbourhood Traffic Management Plan ☐ Other______________________________	2.3.23

Description	Information	Section Reference
Safety Analysis (any special issues)	• Corner Clearance • Sight Distance • Vehicle-pedestrian/cyclist conflicts • Access conflicts • Pedestrian and cyclist movements	2.3.25
Site Access and Circulation (design vehicles)	☒ Passenger Car (P) ☐ Light Single Unit Truck (LSU) ☒ Medium Single Unit Truck (MSU) ☐ Heavy Single Unit Truck (HSU) ☒ Pumper Fire Truck ☐ WB-20 Tractor Semi-Trailer Truck ☒ Other Region of Peel Typical Waste Collection Vehicle	2.3.26
Impacts During Construction (any special issues)	• N/A	2.3.27
Step 3 – Forecasting		
Growth Rate	☒ Obtained from City ☐ Historical traffic counts ☐ Travel demand forecasts ☐ Proposed Growth Rate: ______________________	2.3.15
Site Trip Generation	☒ ITE Trip Generation Manual ~~☒ "First Principles"~~ ☐ Observed rates for similar developments in area ☐ Other ______________________	2.3.19
Trip Reductions	☒ Internal capture reductions for mixed-use developments ☒ Pass-by reductions ☐ Other ______________________	2.3.19
Trip Distribution	Local traffic patterns ☒ TTS ☐ Travel demand model ☐ Population and employment distribution ☐ Market analysis of catchment area ☐ Other ______________________	2.3.20
Trip Assignment	☒ Local traffic patterns Shortest distance ☒ Site layout, access design and logical routing ☐ Existing turning movements ☐ Other ______________________	2.3.21
Transportation Demand Management Plan		

Description	Information	Section Reference
Format	☒ Within a TIA Report ☐ Standalone	3.2.1
Type of Transportation Demand Management Plan	☐ TDM Statement ☒ TDM Scheme	3.2.2
Pedestrian Circulation Plan		
Format	☒ Within a TIA Report ☐ Standalone	4.2.1
Additional Comments		

- **Community Impacts**: Any transportation related impacts on the existing community and comments from the public through the planning approvals process shall be addressed in the report.
- **Access Review**: Ensure that the site access(es) conforms to all TAC standards (e.g. corner clearances, clear throat lengths, veh & ped sight line distances for ingress/egress, proximity/alignment to other driveways/roads, etc.); Provide confirmation and technical justification of whether the site access location(s) and design(s) are safe for all roadway users and why.
- **Traffic Control Warrants**: (e.g. all-way stop, traffic control signals) are to be provided, where applicable, for all three scenarios (existing, future background, future total)
- **Detailed Recommendations**: regarding on-site/off-site roadway improvements, site access, site circulation, and TDM measures shall be made.

My-Linh Yee

From:	Michael Turco <Michael.Turco@mississauga.ca>
Sent:	February 21, 2023 12:40 PM
To:	My-Linh Yee
Cc:	Michael Linton; Kierra Harper
Subject:	RE: 69 & 117 John Street - Terms of Reference
Categories:	Filed to Sharepoint

Hello My-Linh,

We are amenable to your suggestion, subject to the following: (1) append all raw data to the report, (2) append background work showing how the growth rate was calculated, and (3) provide detailed justification for utilizing this rate in the body of the report.

Thank you,

Michael Turco, C.E.T., CPT, MITE
Traffic Planning Technologist
T 905-615-3200 ext. 3597

From: My-Linh Yee <myee@cfcrozier.ca>
Sent: Thursday, February 16, 2023 3:22 PM
To: Michael Turco <Michael.Turco@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; Kierra Harper <kharper@cfcrozier.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Hi Michael,

I hope you are doing well. We received the historic AADT data along Hurontario Street from Tyler and determined that the street has experienced negative growth between 2016 and 2018. Thus, we propose a growth rate of 0% to project the historical TMCs along Hurontario Street to 2023 existing conditions. Can you confirm if this is acceptable?

Thanks,
My-Linh

My-Linh Yee, EIT
Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

CROZIER
CONSULTING ENGINEERS

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Read our latest news and announcements here.

From: Kierra Harper <kharper@cfcrozier.ca>
Sent: January 23, 2023 3:43 PM
To: Michael Turco <Michael.Turco@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Hi Michael,

Thanks for the prompt response!

We will coordinate with Tyler on the growth. We will see if there is AADT available to use to determine an appropriate growth rate to project historic TMCs to approximate 2023 existing volumes. We will ensure our background work is included in the Appendix of the report.

As for the west leg of Hurontario Street at John Street, based on a site visit on January 18th, 2023, the west leg of the intersection is currently completely closed to traffic. In addition, the southbound lanes along Hurontario have been reduced as well. As such, the existing volumes would not be comparable due to the major differences in lane configurations.

We note that the background reports for 22 & 23 Hillcrest Avenue, 3416, 3154 & 3168 Hurontario Street and 3085 Hurontario Street both included the west leg of Hurontario Street at John Street. We will review the methodology used in these reports, as some counts may have been factored up to account for pandemic conditions, and we will ensure to provide all background work used to estimate the volumes at Hurontario Street and John Street in our TIS.

Thank you,
Kierra

Kierra Harper, EIT
Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

CROZIER CONSULTING ENGINEERS

Crozier Connections:

Read our latest news and announcements here.

From: Michael Turco <Michael.Turco@mississauga.ca>
Sent: Monday, January 23, 2023 11:24 AM

To: Kierra Harper <kharper@cfcrozier.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Good morning Kierra,

With respect to the proposed TMC methodology, Tyler's group are typically not able to provide growth rates to apply to old counts to reach existing baseline conditions. Another option could be to obtain historical traffic data counts and utilize regression analysis to determine appropriate growth rates. The report would be required to thoroughly justify all proposed growth rates and the methodology utilized to calculate them. Furthermore, all background work to calculate the growth rates would need to be appended to the report in a format that is easily verifiable to the reviewer. Tyler Xuereb from Transportation Planning Section (tyler.xuereb@mississauga.ca, Ext. 4783) can be reached to obtain historical AADT data and Turning Movement Counts.

In regards to the west leg of the intersection of Hurontario Street & John Street, we can consider a methodology similar to what is proposed. However, even given the ongoing construction it would likely be beneficial to count the existing volumes utilizing this leg.

For the remaining study area intersections not under construction, please note that any new traffic counts are to be compared to pre-pandemic counts to ensure that there are no major discrepancies.

Thank you,

MISSISSAUGA

Michael Turco, C.E.T., CPT, MITE
Traffic Planning Technologist
T 905-615-3200 ext. 3597
michael.turco@mississauga.ca

City of Mississauga | Transportation & Works Department
201 City Centre Drive, Suite 800 | Mississauga ON | L5B 2T4

From: Kierra Harper <kharper@cfcrozier.ca>
Sent: Monday, January 23, 2023 10:39 AM
To: Michael Turco <Michael.Turco@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Good morning Michael,

I hope you are doing well! We are beginning to collect data for this project, and we wanted to confirm our TMC methodology with you due to the ongoing construction of the Hurontario LRT. Please see our proposed plan below:

- We will rely on historical TMCs for the intersections of Hurontario Street at John Street and Hurontario Street at Kirwin Avenue. The following historic counts are available:
    - Hurontario Street at John Street - 2015
    - Hurontario at Kirwin Avenue/Hillcrest Avenue – 2016
- We will project these counts to 2023 conditions. We will confirm an appropriate growth rate with Tyler Xuereb.
- We will make an assumption regarding the existing volumes at the west leg of Hurontario Street at John Street, as this leg did not exist at the time of historic counts. Our assumption will be based on the historic TMCs at

Hurontario Street and Kirwin Avenue/Hillcrest Avenue and on BG development reports. All assumptions will be explained within the TIS.

- For the remaining intersections (not under construction) we will conduct new TMCs.
  - John Street at Little John Lane
  - Kirwin Avenue at Little John Lane
  - John Street at Jaguar Valley Drive
  - Dundas Street at Kirwin Avenue/Camilla Road
  - Kirwin Avenue at Jaguar Valley Drive
- We will obtain pre-construction signal timing data for the signalized intersections along Hurontario Street and current signal timing for the intersection of Dundas Street at Kirwin Avenue/Camilla Road.
- Future signal timing will be assumed and optimized based on the proposed reconstruction of Hurontario Street, including the Hurontario LRT and protected left-turn phases.
- We note that our report will focus more on the future conditions of the study area as existing conditions are currently under construction and not expected to remain. We note that the existing conditions that will be assessed will reflect pre-construction lane configurations.
- We have confirmed growth rates for the future conditions with Tyler Xuereb.

Please let me know if you have any concerns with the above work plan.

Thanks,
Kierra

Kierra Harper, EIT
Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

CROZIER
CONSULTING ENGINEERS

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From: Michael Turco <Michael.Turco@mississauga.ca>
Sent: Thursday, November 3, 2022 12:05 PM
To: Kierra Harper <kharper@cfcrozier.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Hi Kierra,

I would recommend starting with the Planner on file, Adam Lucas (adam.lucas@mississauga.ca).

Regards,

Michael Turco, C.E.T., CPT, MITE
Traffic Planning Technologist
T 905-615-3200 ext. 3597

From: Kierra Harper <kharper@cfcrozier.ca>
Sent: Thursday, November 3, 2022 11:55 AM
To: Michael Turco <Michael.Turco@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>; Trans Projects <Trans.Projects@mississauga.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Hi Michael,

Thank you again for your TOR comments. We were wondering if you know who we can contact from Zoning regarding the loading space requirements?

Regards,
Kierra

Kierra Harper, EIT | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

CROZIER CONSULTING ENGINEERS

Crozier Connections:

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From: Kierra Harper
Sent: Wednesday, November 2, 2022 1:11 PM
To: Michael Turco <Michael.Turco@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>; Trans Projects <Trans.Projects@mississauga.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Hi Michael,

Thank you for your response and comments. We will review and get back to you if we have any questions.

Thanks again,
Kierra

From: Michael Turco <Michael.Turco@mississauga.ca>
Sent: Tuesday, November 1, 2022 4:36 PM
To: Kierra Harper <kharper@cfcrozier.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>; Trans Projects <Trans.Projects@mississauga.ca>
Subject: RE: 69 & 117 John Street - Terms of Reference

Hello Kierra,

Thank you for providing a Transportation Impact Study Terms of Reference for a proposed development at 69 & 117 John Street Please see our comments below in green.

Regards,

Michael Turco, C.E.T., CPT, MITE
Traffic Planning Technologist
T 905-615-3200 ext. 3597
michael.turco@mississauga.ca

City of Mississauga | Transportation & Works Department
201 City Centre Drive, Suite 800 | Mississauga ON | L5B 2T4

From: Kierra Harper <kharper@cfcrozier.ca>
Sent: Tuesday, October 25, 2022 10:54 AM
To: Michael Turco <Michael.Turco@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; My-Linh Yee <myee@cfcrozier.ca>
Subject: 69 & 117 John Street - Terms of Reference

Good Morning Michael,

I hope you are doing well!

We are working with our Client to complete a Transportation Impact Study to support an Official Plan Amendment and Zoning By-Law Amendment for the proposed residential Transit Oriented Development at 69 & 117 John Street. The development concept proposes approximately 1062 residential units. The lands are located within the Cooksville GO Major Transit Station Area (~450m from Cooksville GO Station) and are adjacent to the future Hurontario LRT (~200m from Cooksville GO Station Stop at Hurontario Street and John Street).

Attached you'll find a Preliminary Site Plan for context, but please note that **the plan is currently being refined and the stats and details are subject to change**. On this basis, we proposed the following Terms of Reference for the Transportation Study.

Study Intersections

- Hurontario Street at John Street
- Hurontario at Kirwin Avenue
- John Street at Little John Lane
- Kirwin Avenue at Little John Lane
- John Street at Jaguar Valley Drive
- Site Access(es)

- Dundas Street & Kirwin Avenue
- Kirwin Avenue & Jaguar Valley Drive

Existing Conditions

- Analyze the existing traffic conditions based on peak hour traffic counts using Synchro Version 11.0, LOS (based on control delays), maximum volume-to-capacity ratios and queue length will be evaluated based on HCM 2000 standards.
- Weekday a.m. and p.m. peak periods; 7:00 a.m. to 9:00 a.m. & 4:00 p.m. to 7:00 p.m.; reflective of the typical commuter peak period.
- We have reached out to tyler.xuereb@mississauga.ca regarding Turning Movement Counts (TMCs) and have been informed the following TMCs are available:
  - Hurontario Street at John Street - 2015
  - Hurontario at Kirwin Avenue - 2016
  - John Street at Little John Lane – No Count
  - Kirwin Avenue at Little John Lane – 2020, 2017
  - John Street at Jaguar Valley Drive - 2013
- As many of the above TMCs are quite outdated we would like to propose conducting new counts at the study intersections. New traffic counts are to be compared to pre-pandemic counts to ensure that there are no major discrepancies.
- We have reached out to Jim.Kartsomanis@mississauga.ca for signal timing data.

Study Horizon

- We propose a 2027 study horizon consistent with the City's Traffic Impact Study Guidelines.

Growth Rates

- We understand that as a result of lane reductions along Hurontario to support the LRT designs that background traffic growth is expected to decline upon LRT implementation compared to present day. Could you confirm the appropriate growth rates to use along the Hurontario Street corridor during our horizon year? Please contact Tyler Xuereb from Transportation Planning Section (tyler.xuereb@mississauga.ca, Ext. 4783) to confirm growth rates for the study area roadways.
- Alternately, we have reviewed recent reports in the area, and we would like to propose the following growth rates, consistent with the background development 25 Hillcrest Avenue & 3154 Hurontario Street (BA Group, May 2022).

Corridor	Travel Direction	Existing 2022 to 2026		2026 to 2027	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Hurontario Street	Northbound	-20.5% in total	-20.5% in total	1.0% per annum	0.5% per annum
	Southbound	-23.5% in total	-17.5% in total	0.5% per annum	0.5% per annum
John Street	Eastbound	0% per annum	0% per annum	0% per annum	0% per annum
	Westbound	0% per annum	0% per annum	0% per annum	0% per annum

- In addition, similar to John Street, we would like to propose a 0% growth rate for the remaining roadways in the boundary road network, including :
  - Kirwin Avenue (consistent with 3085 Hurontario Street TIS (CGH Transportation, July 2021))
  - Jaguar Valley Drive (consistent with 3085 Hurontario Street TIS (CGH Transportation, July 2021))
  - Little John Lane
- These roads carry local accesses only and would only be expected to experience future growth as a result of redevelopment.

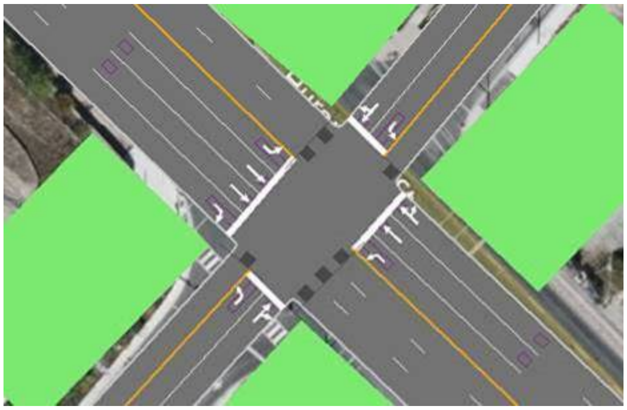
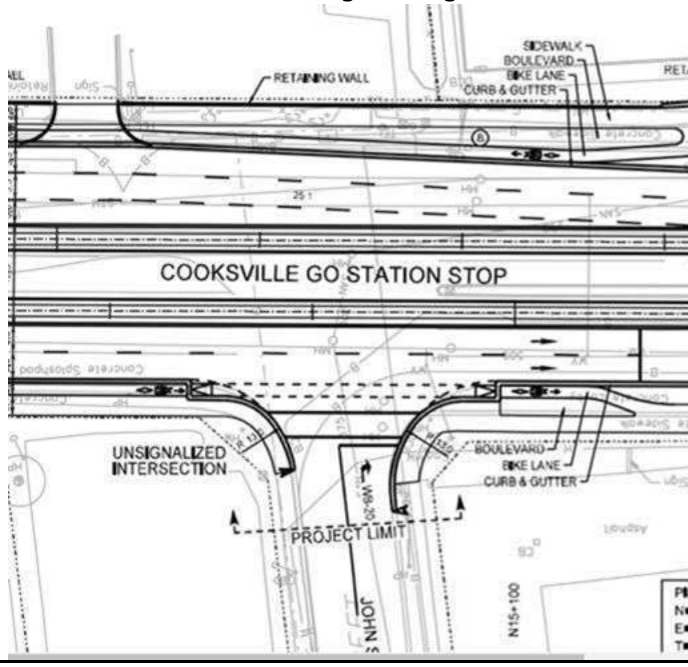
Background Developments

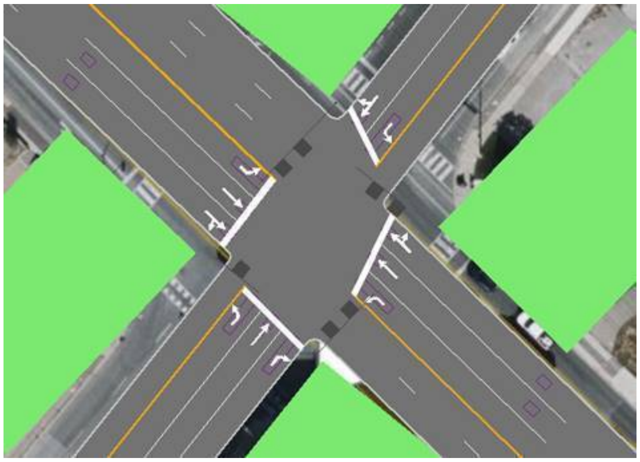
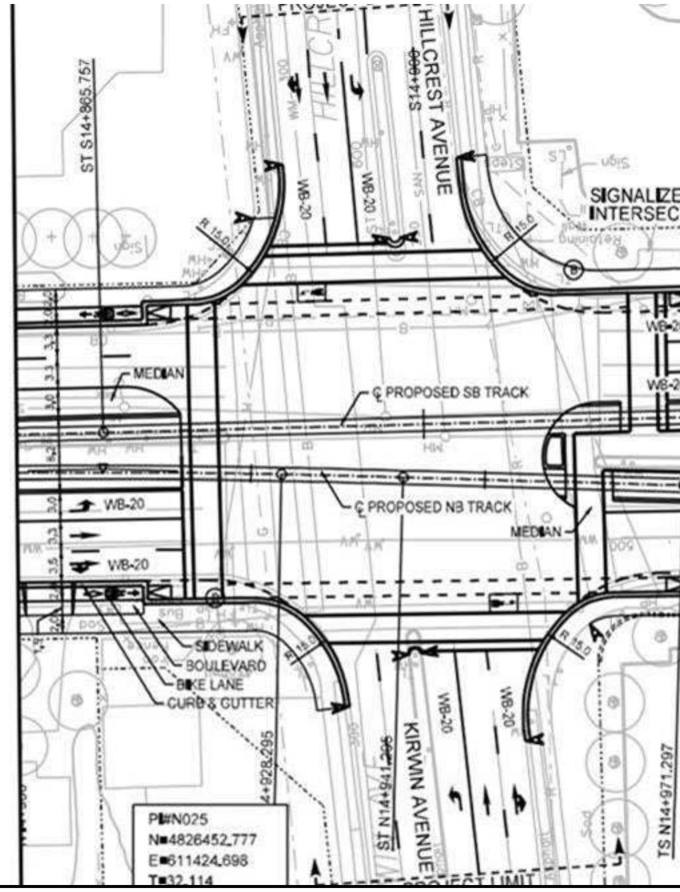
- We will include the following background developments in our analysis:
  - 3085 Hurontario Street

- ○ 25 Hillcrest Avenue & 3154 Hurontario Street
  - ○ 3016-3032 Kirwin Avenue & 3031 Little John Lane
  - ○ 3420 & 3442 Hurontario Street
  - ○ 60 Dundas Street East
- Based on a review of the current City of Mississauga development applications, no other relevant background developments were identified. We assume any other background developments would be captured in the growth rates. Please confirm if there are additional background developments you would like us to include in our analysis. All in-stream and recently approved background developments within approximately 1km from the subject site must be included. Please use the following link to gather information on any developments proposed in the area for background traffic: http://www.mississauga.ca/portal/residents/developmentinformation

Hurontario LRT

- We understand the that the Hurontario LRT is expected to be completed in fall 2024. Can you advise if there are any updates to this timeline that we should be aware of? Refer to https://www.mississauga.ca/projects-and-strategies/city-projects/hurontario-light-rail-transit/ for most recent LRT updates and information
- Could you please let us know who we can contact regarding future projected pedestrian volumes for the intersections along the Hurontario LRT? Not available.
- We have reviewed Appendix A.1 of the Hurontario LRT Design Document (2014). Please find attached the relevant design excerpt for our study area. Can you please advise if there are any final design changes to the attached? Refer to https://www.metrolinx.com/images/greaterregion/projects/hurontario-lrt/June2017LRTRolloutmap1.pdf
- We notice that in the attached design Hurontario Street at John Street appears to be an unsignalized right-in-right-out intersection. However, based on a desktop review we notice that the west approach of the intersection of Hurontario Street at John Street was reconfigured as part of the Cooksville GO Station Improvements. Can you please confirm the future configuration of Hurontario Street at John Street once the LRT is implemented? Refer to https://www.metrolinx.com/images/greaterregion/projects/hurontario-lrt/June2017LRTRolloutmap1.pdf
- The existing and future intersection lane configurations that we have currently assumed are summarized below:

Intersection	**Intersection Configuration**	
	Existing (Desktop Review)	**Future – Post LRT (Appendix A.1 – 2014)**
Hurontario Street at John Street	Signalized Full Moves 	Unsignalized Right-In-Right-Out 

<table>
<tr>
<td>Hurontario Street at Kirwin Avenue</td>
<td>Signalized
Full Moves
</td>
<td>Signalized
Full Moves

</td>
</tr>
</table>

Background Traffic Volumes

- We will forecast the 2027 future background volumes based on the above growth rate and background developments. Please advise of any alternate growth rates to be applied if relevant. As previously noted, please confirm with City Transportation Planning staff.
- Future background volumes will be analyzed based on Synchro Version 11.0, LOS (based on control delays), maximum volume-to-capacity ratios and queue length will be evaluated based on HCM 2000 standards.

Future Conditions

- Trip Distribution will be based on Transportation Tomorrow Survey (TTS) data and/or forecasted travel patterns.
- Trip Generation will be based on ~~first principles and~~ ITE Trip Generation Manual, 11th edition ~~as required~~.
- Future background and future total conditions will be compared to identify if capacity and queuing issues are forecasted and if mitigation measures are required.

Traffic Safety

- The available site distance at the proposed site access will be compared to standards set out by the Transportation Associates of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR).
- The supportability of site access locations and restrictions will be reviewed based on traffic operations and expected queue lengths, as well as applicable access spacing guidelines.
- Conflicts will be reviewed between vehicles, pedestrians, cyclists, and recommendations made to maintain multimodal safety.
- Ensure that the site accesses conform to all TAC standards (e.g. corner clearances, clear throat lengths, veh & ped sight line distances for ingress/egress, proximity/alignment to other driveways/roads, etc.); Provide confirmation and technical justification of whether the site access location and design is safe for all roadway users and why.

TDM Review

- Transportation Demand Management (TDM) opportunities will be assessed, and site-specific measures for the development will be recommended to reduce single-occupancy vehicle (SOV) trips and promote sustainable transportation in line with the City and Region's mode share targets and vision for the Hurontario Street Corridor.

Parking

- Parking requirements will be assessed per Precinct 1 requirements of the City of Mississauga Zoning By-Law (ZBL) 0117-2022, 0118-2022. The Traffic Section does not review Parking Studies. Please contact parkingstudy.review@mississauga.ca to confirm the Parking Study ToR.

Loading

- Loading requirements have been reviewed per Section 3.1.4.5 of the City of Mississauga ZBL 0174-2017. The City's ZBL requires: *"One loading space per apartment building containing a minimum of 30 dwelling units."*
- Based on the loading requirement above, we would like to confirm if the proposed development would be considered as one building or three separate buildings? Please confirm with Zoning staff.

Other

- Vehicle Turning Diagrams will be provided. Truck Access and Circulation (AutoTurn Swept-Path Analysis) - ensure that truck traffic (garbage/loading) can enter and exit the site in a forward motion and access to the garbage and loading areas are functional. On separate plans, illustrate truck turning movements with one continuous path with AutoTURN and insert the design vehicles on the plan. The site must be able to accommodate the largest design vehicles which will be accessing the property. An evaluation of the parking areas and ramps using a PTAC design vehicle should also be included. Trucks must be able to enter the site in a forward motion, turnaround on private property, and exit the site in a forward motion.
- Community Impacts: Any transportation related impacts on the existing community and comments from the public through the planning approvals process shall be addressed in the report.
- Traffic Control warrants are to be provided, where applicable.
- Detailed Recommendations regarding on-site/off-site roadway improvements, site access, site circulation, and TDM measures shall be made.

If you have any questions or would like to discuss further, please do not hesitate to reach out.

Thank you,
Kierra

Kierra Harper, EIT | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

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CONSULTING ENGINEERS

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Read our latest news and announcements here.

My-Linh Yee

From: Tyler Xuereb <Tyler.Xuereb@mississauga.ca>
Sent: January 30, 2024 11:31 AM
To: My-Linh Yee
Cc: Michael Linton; Kierra Harper
Subject: RE: 69 & 117 John Street: Updated Growth Rates

Hi My-Linh,

The rates that I previously provided are still sufficient. As for the rates from 2027 – 2029, you will use the same rates provided for the 2026 – 2027 horizon year as a 2031 horizon was used in calculating these rates.

Regards,

Tyler Xuereb
Transportation Planning Analyst
T 905-615-3200 ext.4783
Tyler.xuereb@mississauga.ca

City of Mississauga | Transportation and Works Department,
Infrastructure Planning and Engineering Services Division

From: My-Linh Yee <myee@cfcrozier.ca>
Sent: Monday, January 29, 2024 5:22 PM
To: Tyler Xuereb <Tyler.Xuereb@mississauga.ca>
Cc: Michael Linton <mlinton@cfcrozier.ca>; Kierra Harper <kharper@cfcrozier.ca>
Subject: 69 & 117 John Street: Updated Growth Rates

Good afternoon Tyler,

I hope you are doing well. You had previously provided us growth rates for our project located at 69 & 117 John Street (see attached correspondence). Since then, we have conducted another DARC and thus Terms of Reference with City staff. Can you confirm if the previously provided growth rates (outlined in the table below) are still sufficient? In addition, can you confirm the growth rates for the below roads for 2027 to 2029?

Corridor	Travel Direction	2022 to 2026		2026 to 2027	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Hurontario Street	Northbound	-20.5% (total)	-20.5% (total)	1.0% (per annum)	0.5% (per annum)
	Southbound	23.5% (total)	-17.5% (total)	0.5% (per annum)	0.5% (per annum)
Kirwin Avenue/Hillcrest	Eastbound	0.5% (per annum)	0.5% (per annum)	0% (per annum)	0.5% (per annum)
	Westbound	0.5% (per annum)	0.5% (per annum)	0.5% (per annum)	0% (per annum)
Dundas Street East	Eastbound	0% (per annum)	0.5% (per annum)	0% (per annum)	0% (per annum)

	Westbound	1.0% (per annum)	0% (per annum)	0% (per annum)	0% (per annum)
Kirwin Avenue/Camilla Road	Northbound	0.5% (per annum)	0.5% (per annum)	0.5% (per annum)	0% (per annum)
	Southbound	0.5% (per annum)	0.5% (per annum)	0% (per annum)	0.5% (per annum)
Jaguar Valley Drive	Northbound	0% (per annum)			
	Southbound	0% (per annum)			
Little John Lane	Northbound	0% (per annum)			
	Southbound	0% (per annum)			

Thanks,
My-Linh

My-Linh Yee, EIT
Engineering Intern, Transportation
Office: 905.876.7159
Collingwood | Milton | Toronto | Bradford | Guelph

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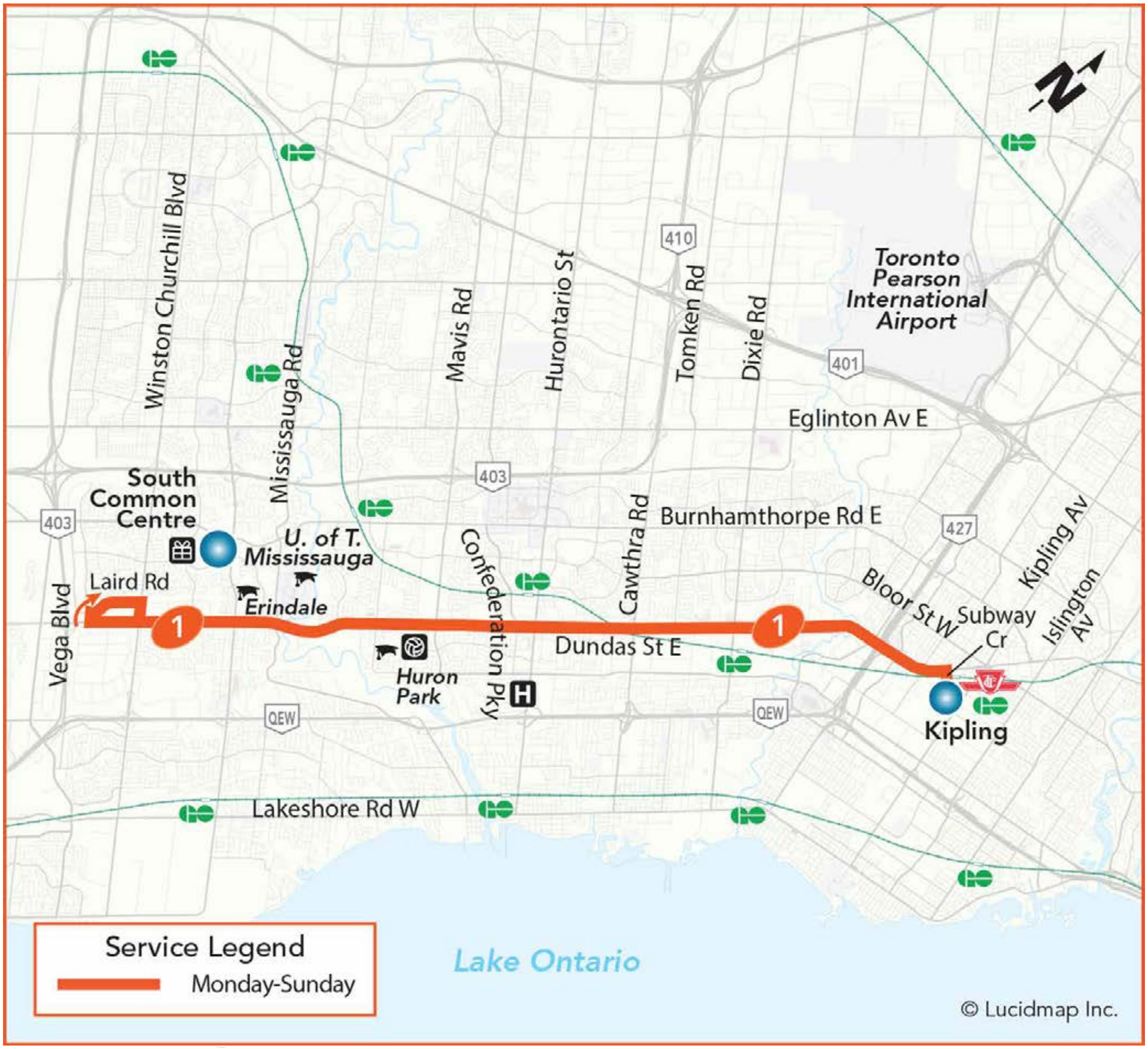
APPENDIX C:

Existing Transit Information

1 Dundas

Local Route
Monday to Sunday

Eastbound to Kipling Bus Terminal
Westbound to Laird Rd/Ridgeway Dr



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

Effective: January 4, 2021

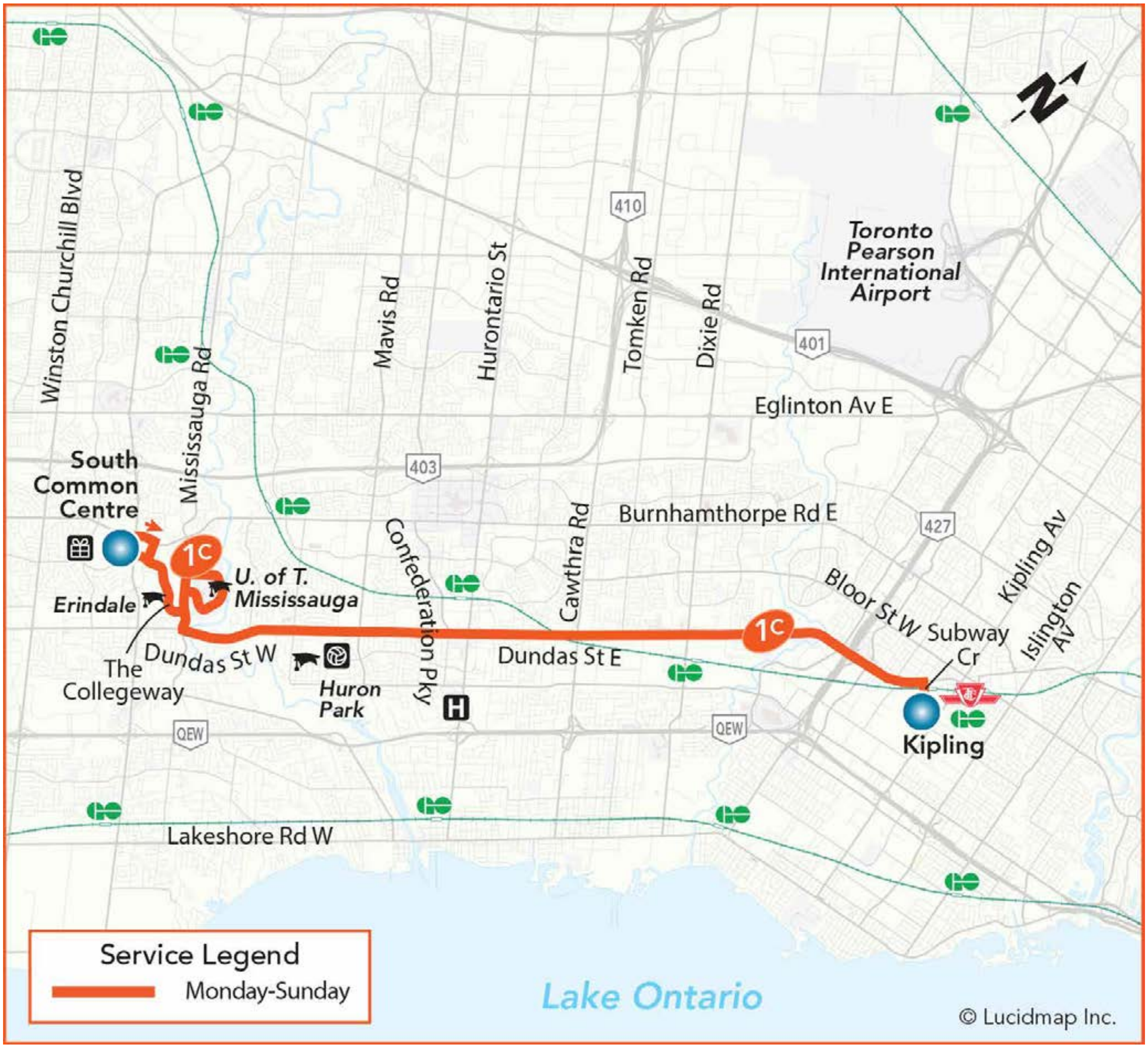
MiWay MISSISSAUGA

1C

Dundas-Collegeway

Local Route
Monday to Sunday

Eastbound to Kipling Bus Terminal
Westbound to South Common Centre



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

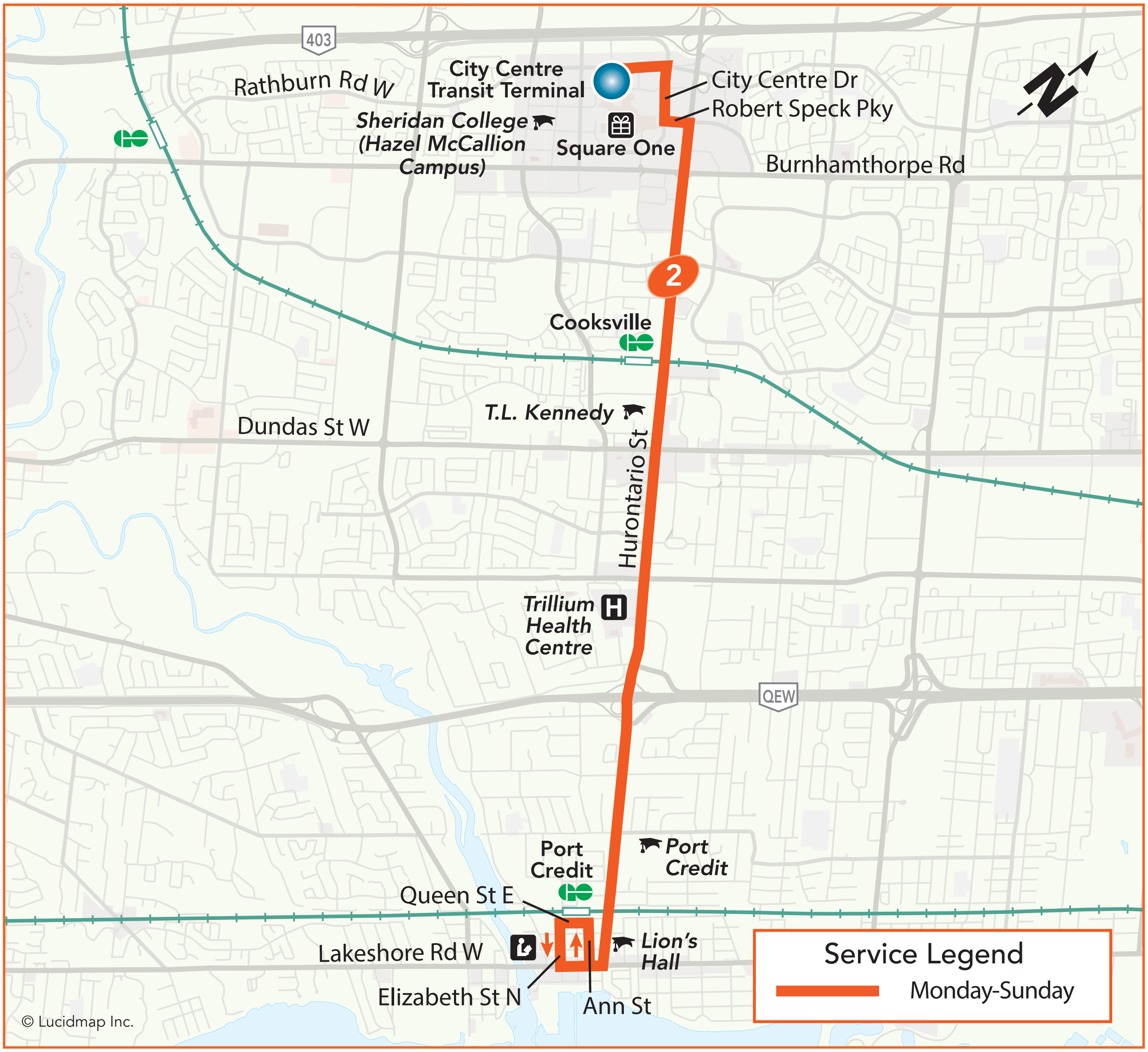
Effective: January 4, 2021

MiWAY MISSISSAUGA

2 Hurontario

Local Route
Monday to Sunday

Northbound to City Centre Transit Terminal
Southbound to Port Credit GO Station



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

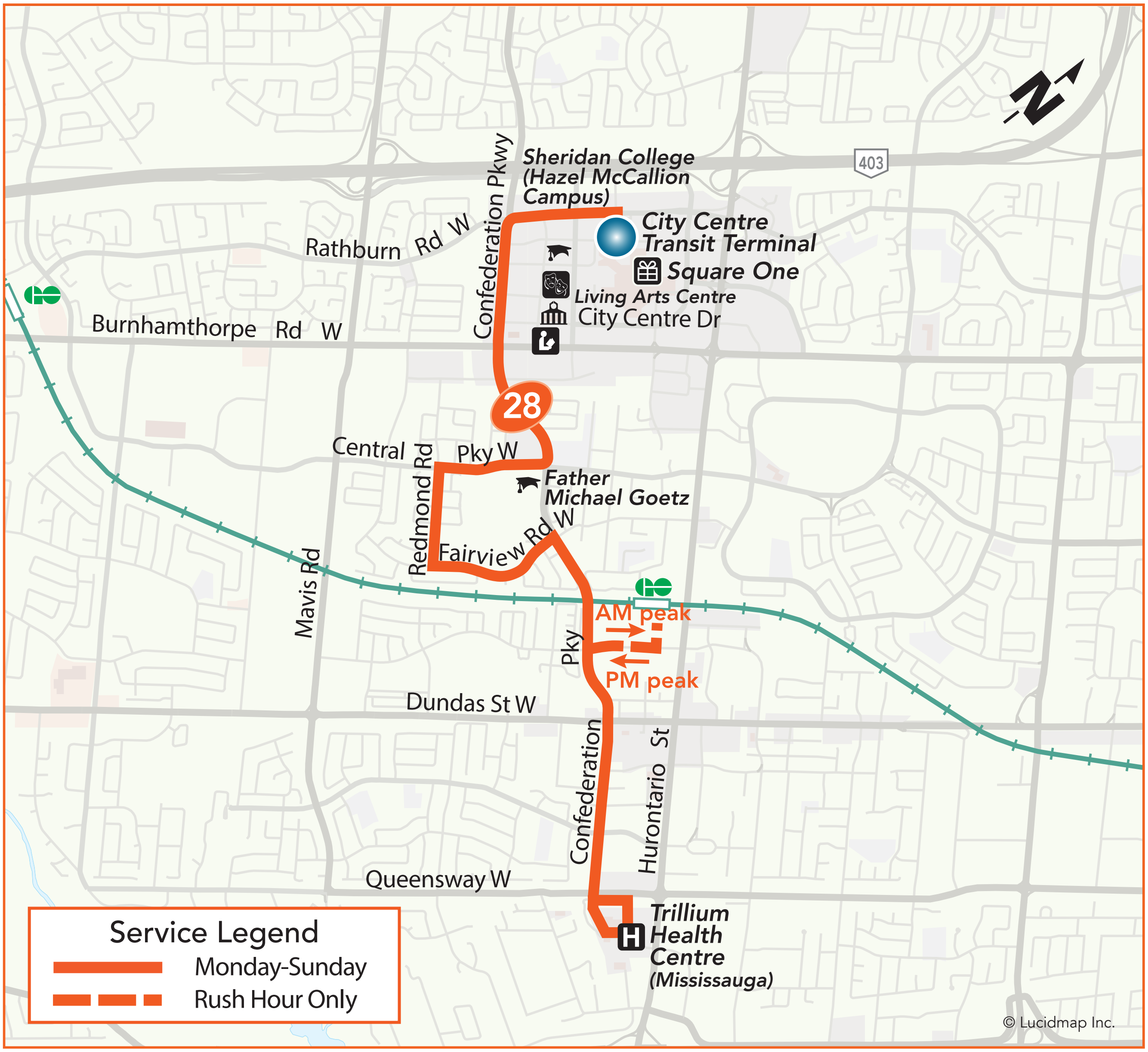
Effective: April 27, 2020

MiWAY MISSISSAUGA

28 Confederation

Local Route
Monday to Sunday

Northbound to City Centre Transit Terminal
Southbound to Trillium Health Centre



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

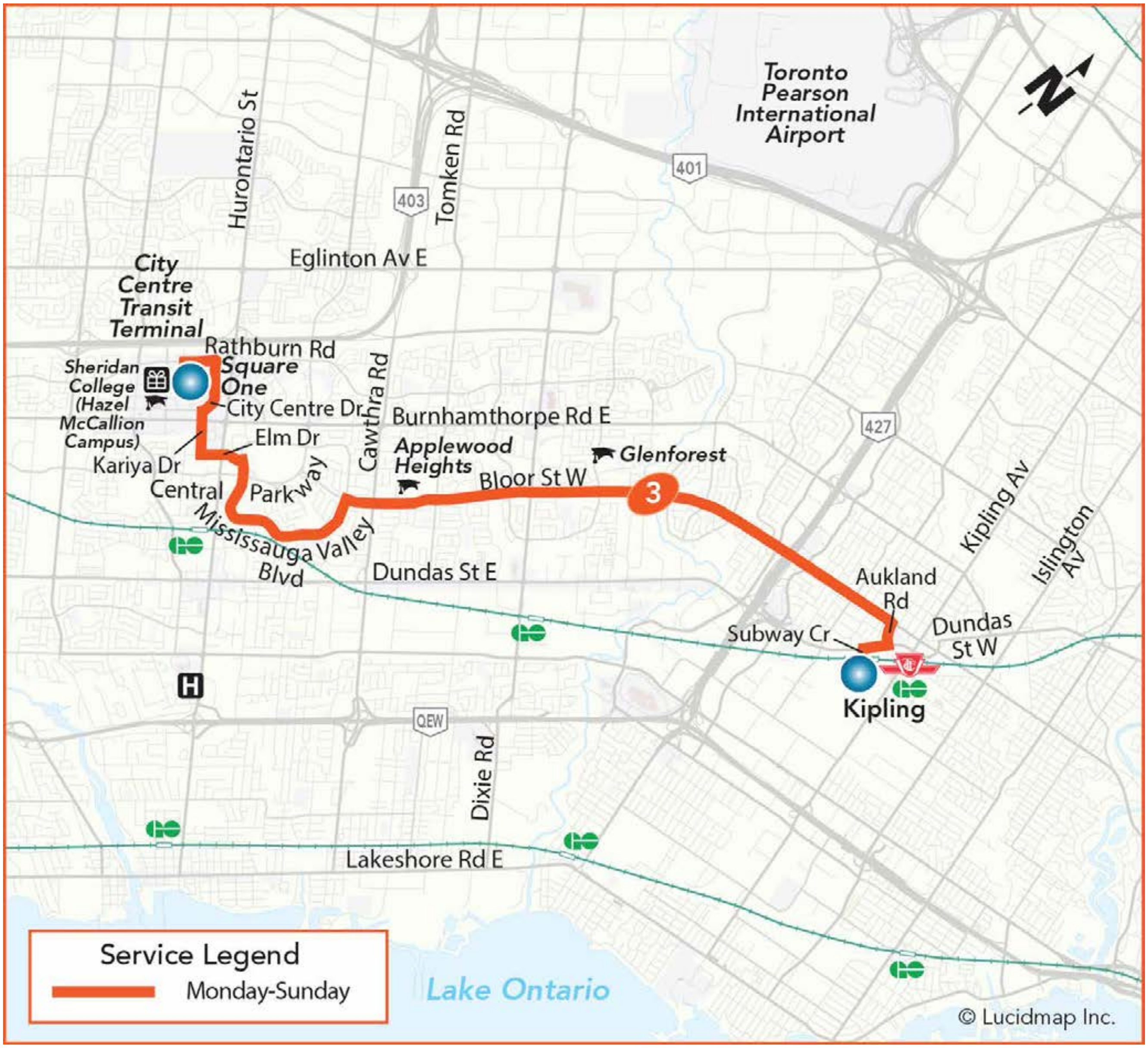
Effective: September 05, 2016

MiWAY MISSISSAUGA

3 Bloor

Local Route
Monday to Sunday

Eastbound to Kipling Bus Terminal
Westbound to City Centre Transit Terminal



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

Effective: January 4, 2021

MiWay MISSISSAUGA

4 Sherway Gardens

Local Route
Monday to Sunday

Eastbound to Sherway Gardens
Westbound to Cooksville GO Station

Legend

- Terminal
- Transitway Station
- High School, University or College
- TTC Subway Station
- GO Train Station
- Hospital
- Library
- Community Centre
- Shopping Centre

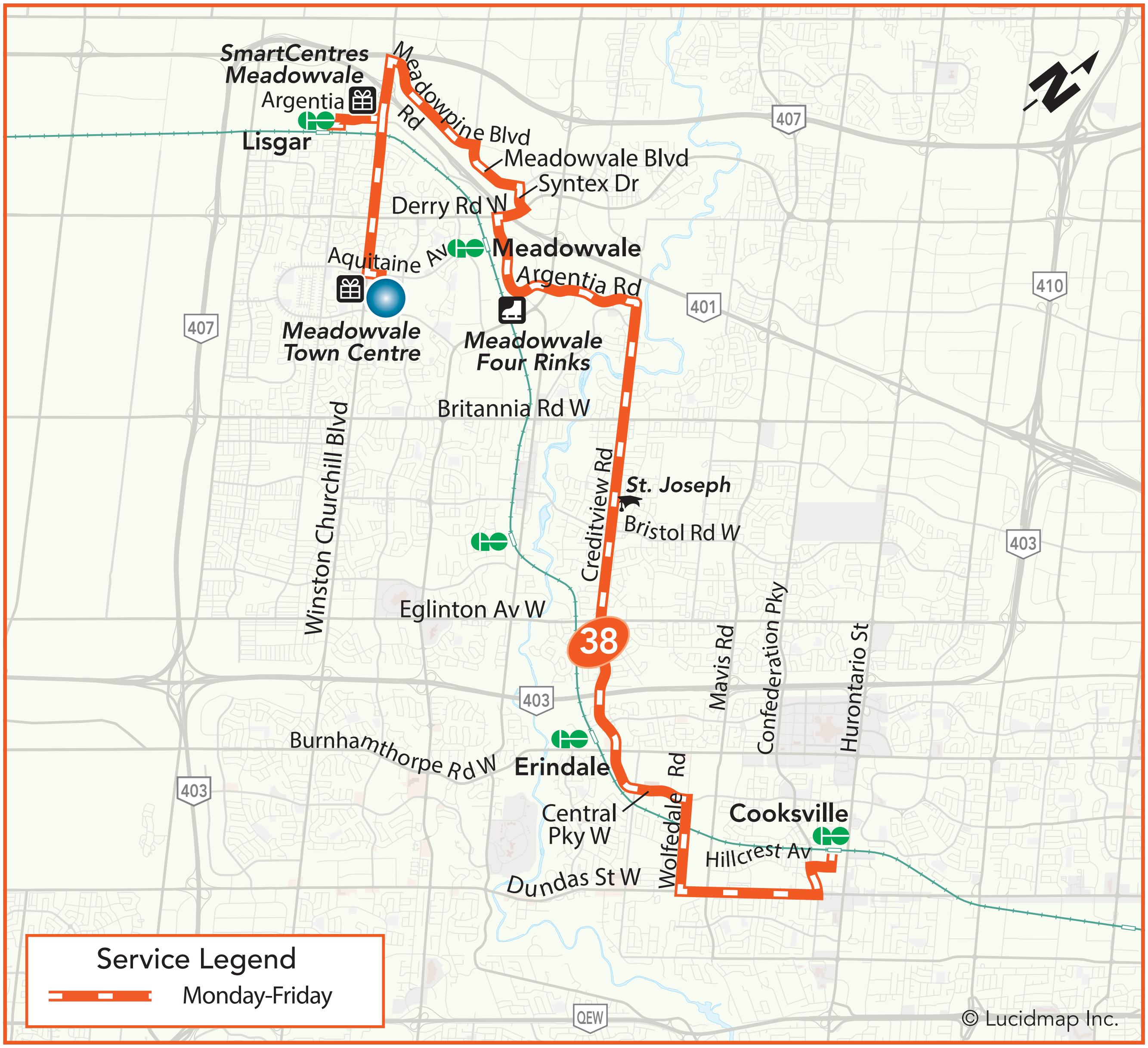
Effective: September 6, 2021

MiWAY MISSISSAUGA

38 Creditview

Local Route
Monday to Friday

Northbound to Meadowvale Town Centre
Southbound to Cooksville GO Station



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

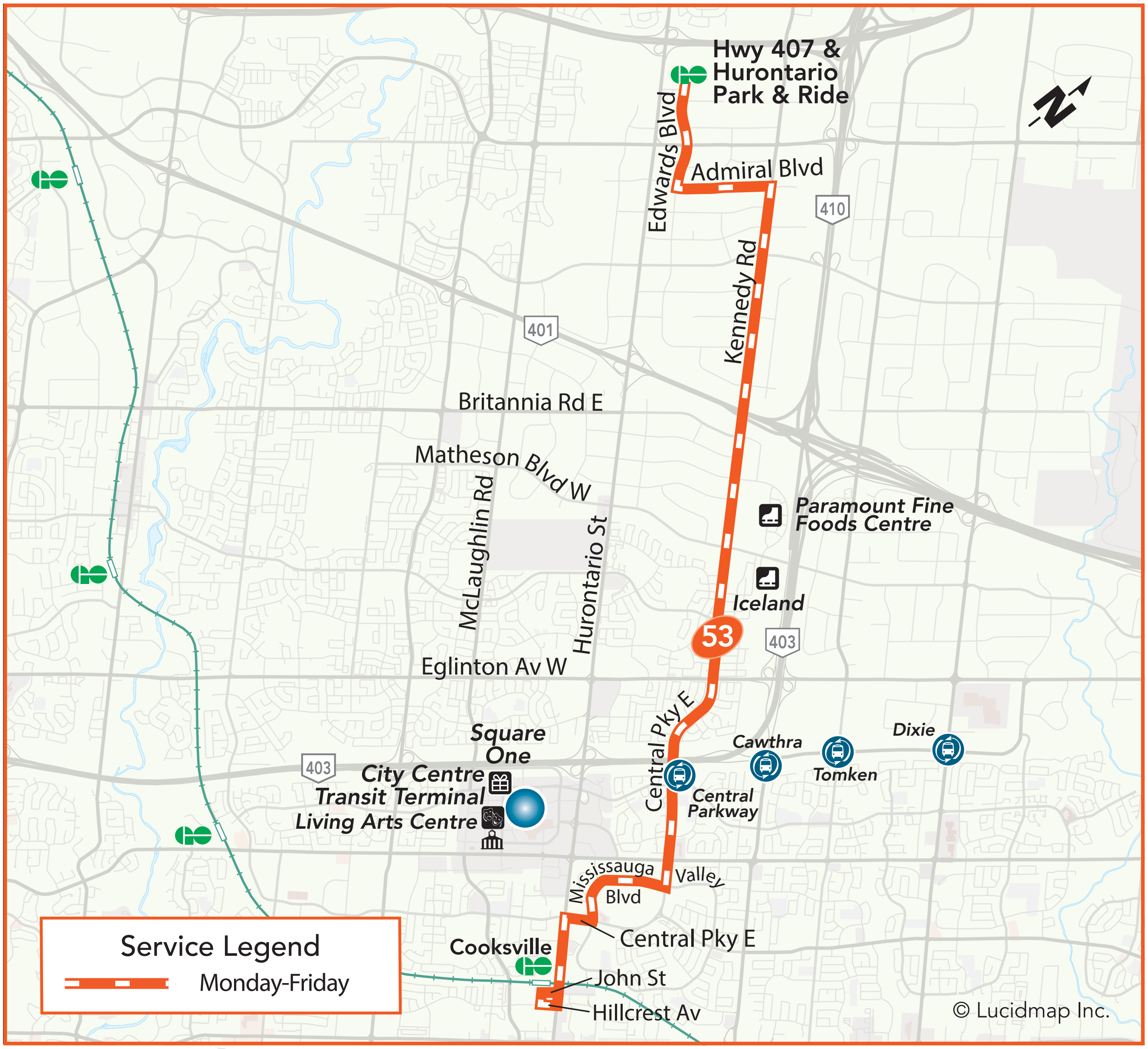
Effective: April 26, 2021

MiWay · Mississauga

53 Kennedy

Local Route
Monday to Friday

Northbound to Hurontario/Highway 407 Park & Ride
Southbound to Cooksville GO Station



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

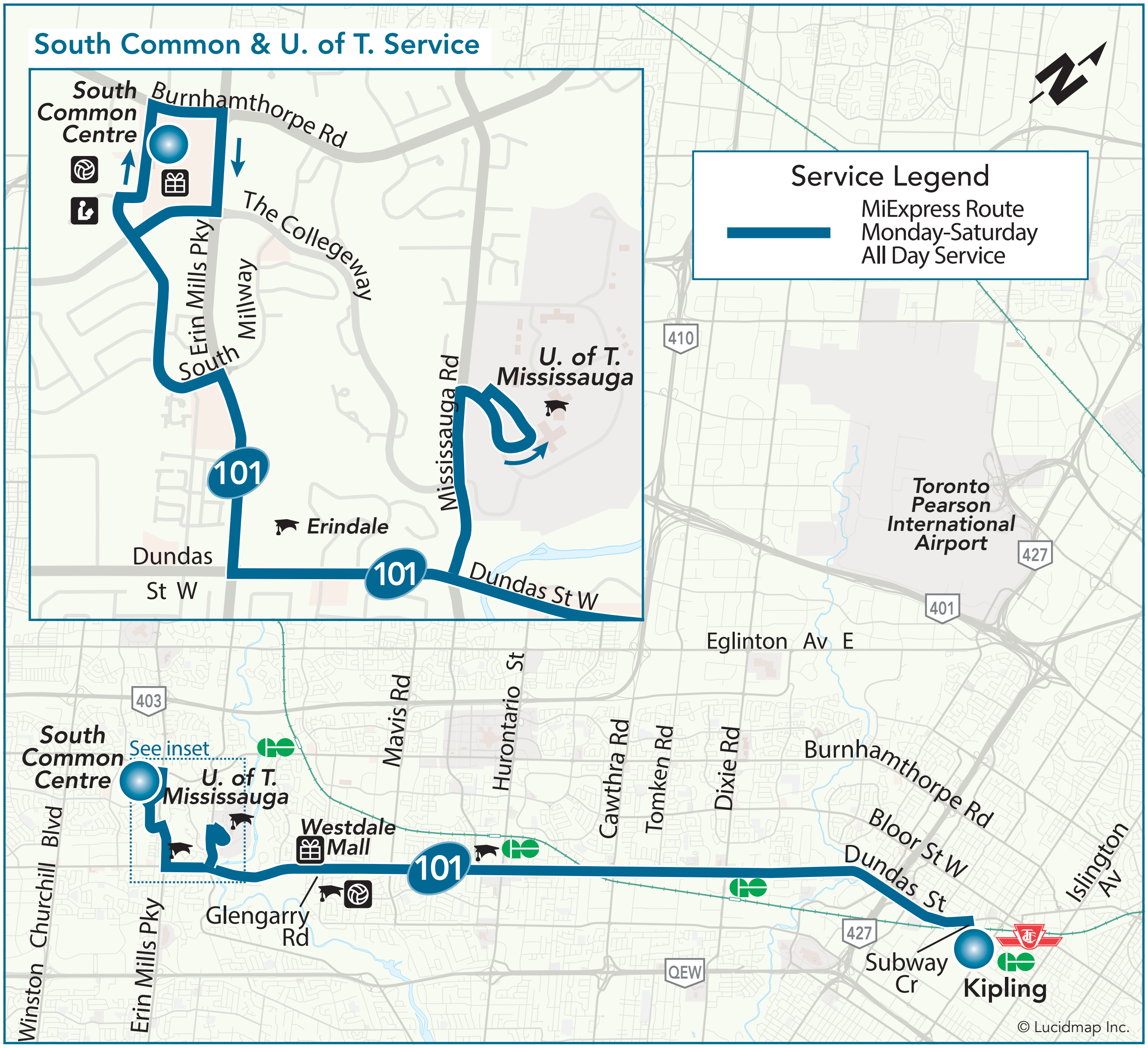
Effective: February 22, 2021

MiWAY MISSISSAUGA

101 Dundas Express

Express Route
Monday to Saturday

Eastbound to Kipling Bus Terminal
Westbound to South Common Centre



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

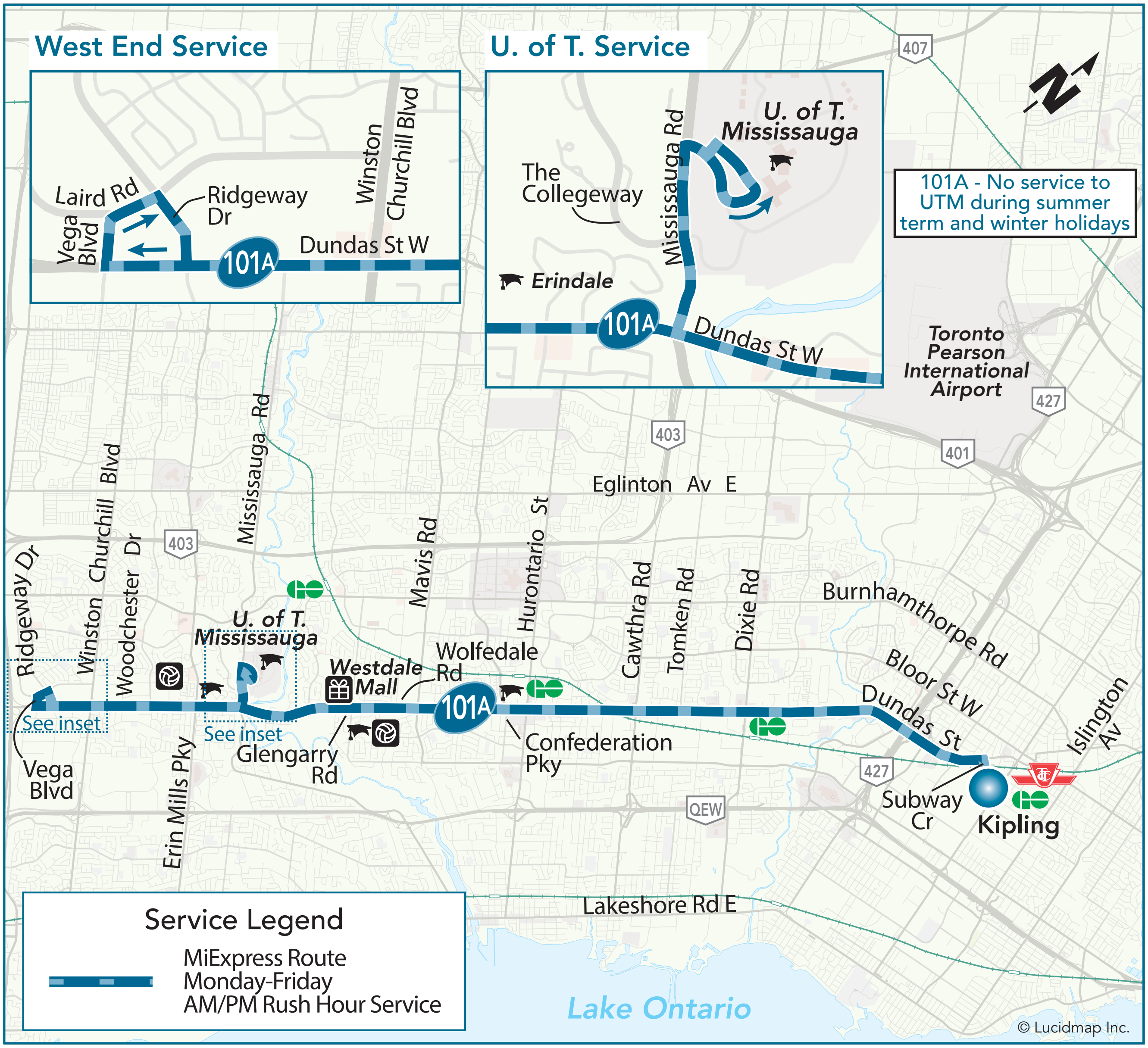
Effective: October 23, 2023

MiWAY MISSISSAUGA

101A Dundas Express

Express Route
Monday to Friday

Eastbound to Kipling Bus Terminal
Westbound to Ridgeway Dr



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

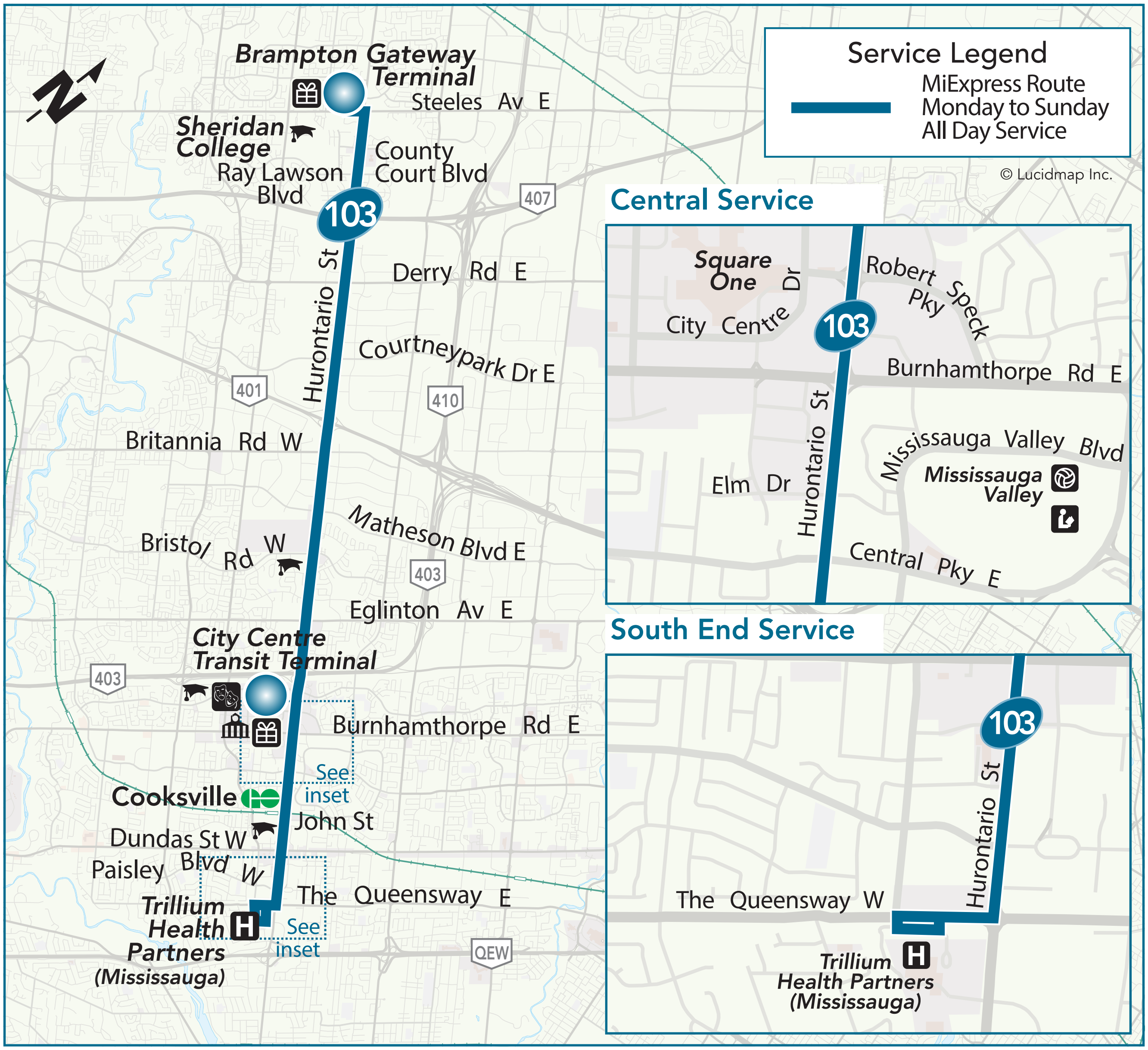
Effective: September 5, 2022

MiWAY MISSISSAUGA

103 Hurontario Express

Express Route
Monday to Sunday

Northbound to Brampton Gateway Terminal
Southbound to Trillium Health Centre (Mississauga)



Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

Effective: August 1, 2022

MiWAY MISSISSAUGA

21 Route number
Nombre d'itinéraire

Milton

CONTACT US

1-888-438-6646
416-869-3200
TTY: #711 or call
1-800-855-0511

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@GOtransitBus

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Say Something.
24/7 Transit Safety Dispatch:
1-877-297-0642

prestocard.ca

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gotransit.com/OnTheGO

Milton

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- Oakville
- Mississauga
- Toronto

Daily / Quotidiennement

Includes GO Bus routes 21 / Inclut les routes 21 d'autobus GO

Effective / À partir de:
6 JANUARY JANVIER 2024

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Step 2
The upper left corner tells you what day the schedule is for and the direction of travel.

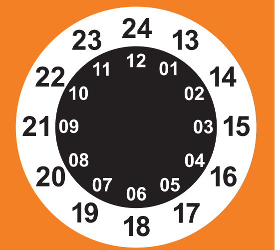
Step 3
Look across the rows for available departure times.

Step 4
Not all trains or buses stop at every station. If you see → the train or bus will not stop at that station.

Schedule times shown in 24-hour clock

Midnight to noon
00 01 - 12 00

Noon to midnight
12 01 - 24 00



Legend

Train trips

Bus trips

→ Trip does not serve this location.

GO Bus service is accessible to passengers using mobility devices at this location.

GO Train & GO Bus service is accessible to passengers using mobility devices at this location.

GO Train service is accessible to passengers using mobility devices at this location.

Parking available.

For the latest schedule information and updates, please visit gotransit.com/schedules.

Notes

Bicycles

1. Bicycles are not allowed in Union Station or on-board trains during morning rush hour (6:30-9:30) and evening rush hour (15:30-18:30), Monday to Friday.

2. Foldable bicycles are allowed on-board trains at all times.

Comment lire nos horaires

Étape 1
Trouvez votre gare ou terminus de départ. La liste des arrêts est donnée en haut dans l'ordre dans lequel ils sont desservis.

Étape 2
Le coin supérieur gauche vous indique le jour pour lequel l'horaire est donné et la direction de circulation.

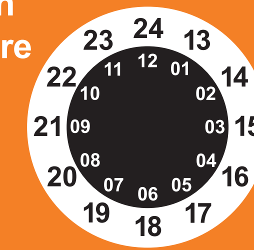
Étape 3
Regardez dans les rangées pour obtenir les heures de départ offertes.

Étape 4
Les trains ou les autobus ne s'arrêtent pas tous à chaque gare. Si vous voyez le symbole → le train ou l'autobus ne s'arrêtera pas à cette gare.

Indications selon un système horaire de 24 heures

De minuit à midi:
00 01 - 12 00

De midi à minuit:
12 01 - 24 00



Légende

Horaire des trains

Horaire des autobus

→ Trajet ne sert pas cette station.

Service d'autobus GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.

Les services de trains et d'autobus GO sont accessibles aux utilisateurs d'un appareil d'aide à la mobilité à cet en-droit.

Service de trains GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.

Stationnement disponible.

Pour consulter les horaires les plus récents et les mises à jour, veuillez visiter gotransit.com/schedules.

Notes

Vélos

1. Les vélos ne sont pas autorisés dans la gare Union ou à bord des trains du lundi au vendredi, pendant l'heure de pointe (6:30-9:30) et pendant l'heure de pointe du soir (15:30-18:30).

2. Les vélos pliables sont permis à bord des trains en tout temps.

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)
EASTBOUND / EN DIRECTION EST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Milton 24 Dp Milton GO	Mississauga 22 Derry Rd. W. @ Ninth Line	Mississauga 23 Dp Lisgar GO	Mississauga 22 Aquitane Ave. @ Meadowvale Town Centre Circle	Mississauga 22 Meadowvale GO	Mississauga 21 Streetsville GO	Oakville 13 Trafalgar Rd. @ Hwy. 407	Oakville 12 Sheridan College	Oakville 13 Oakville GO	Mississauga 40 Erin Mills Transitway	Mississauga 40 Erindale GO	Mississauga 12 Clarkson GO	Mississauga 20 Dp Square One	Mississauga 11 Cooksville GO	Mississauga 10 Port Credit GO	Mississauga 11 Dixie GO	Etobicoke 59 Long Branch GO	Etobicoke 79 Mimico GO	Etobicoke 3 Kipling GO	Toronto 2 Exhibition GO	Toronto 2 Ar Union Station
21	21000	03 45	03 55	04 02	04 08	04 15	04 23	→	→	→	→	04 36	→	04 45	04 55	→	→	→	→	→	→	05 20
21	21070	04 20	04 30	04 37	04 43	04 50	04 58	→	→	→	→	05 11	→	05 20	05 30	→	→	→	→	→	→	06 00
	1004									05 16	→	→	05 23	→	→	05 29	→	05 35	05 44	→	05 51	06 00
21	21100	04 45	04 55	05 02	05 08	05 15	05 23	→	→	→	→	05 36	→	05 45	05 55	→	→	→	→	→	→	06 30
	1704									05 46	→	→	05 53	→	→	05 59	→	06 05	06 14	→	06 21	06 30
	2706	05 59	→	06 07	→	06 12	06 19	→	→	→	→	06 24	→	→	06 30	→	06 35	→	→	06 42	→	07 03
	2712	06 29	→	06 37	→	06 42	06 49	→	→	→	→	06 54	→	→	07 00	→	07 05	→	→	07 12	→	07 33
	2714	06 59	→	07 07	→	07 12	07 19	→	→	→	→	07 24	→	→	07 30	→	07 35	→	→	07 42	→	08 03
	2716	07 14	→	07 22	→	07 27	07 34	→	→	→	→	07 39	→	→	07 45	→	07 50	→	→	07 57	→	08 18
	2718	07 29	→	07 37	→	07 42	07 49	→	→	→	→	07 54	→	→	08 00	→	08 05	→	→	08 12	→	08 33
	2720	07 44	→	07 52	→	07 57	08 04	→	→	→	→	08 09	→	→	08 15	→	08 20	→	→	08 27	→	08 48
	2722	07 59	→	08 07	→	08 12	08 19	→	→	→	→	08 24	→	→	08 30	→	08 35	→	→	08 42	→	09 03
	2726	08 29	→	08 37	→	08 42	08 49	→	→	→	→	08 54	→	→	09 00	→	09 05	→	→	09 12	→	09 33
21A	21240	09 12	→	→	→	→	→	09 33	09 43	09 51↓												
21B	21242			08 59	09 09	09 15	09 27	→	→	→	09 39	→	09 54↓									
21C	21244											09 29	→	09 39	09 49	10 04↓						
	1712									10 01	→	→	10 08	→	→	10 14	→	10 20	10 29	→	10 36	10 45
21A	21260	09 41	→	→	→	→	→	10 03	10 13	10 21↓												
21D	21262			09 44	09 52	09 58	→	→	→	→	→	→	10 24↓									
21C	21264											09 59	→	10 09	10 19	10 34↓						
	1014									10 31	→	→	10 38	→	→	10 44	→	10 50	10 59	→	11 06	11 15
21A	21280	10 11	→	→	→	→	→	10 33	10 43	10 51↓												
21B	21282			10 04	10 12	10 18	10 30	→	→	→	10 40	→	10 54↓									
21C	21284											10 29	→	10 39	10 49	11 04↓						
	1714									11 01	→	→	11 08	→	→	11 14	→	11 20	11 29	→	11 36	11 45
21A	21300	10 41	→	→	→	→	→	11 03	11 13	11 21↓												
21D	21302			10 45	10 53	10 59	→	→	→	→	→	→	11 25↓									
21C	21304											10 59	→	11 09	11 19	11 34↓						
	1016									11 31	→	→	11 38	→	→	11 44	→	11 50	11 59	→	12 06	12 15
21A	21320	11 11	→	→	→	→	→	11 33	11 43	11 51↓												
21B	21322			11 04	11 12	11 18	11 30	→	→	→	11 40	→	11 54↓									
21C	21324											11 29	→	11 39	11 49	12 04↓						
	1716									12 01	→	→	12 08	→	→	12 14	→	12 20	12 29	→	12 36	12 45
21D	21342			11 44	11 52	11 58	→	→	→	→	→	→	12 24↓									
	1018									12 31	→	→	12 38	→	→	12 44	→	12 50	12 59	→	13 06	13 15
21A	21360	12 11	→	→	→	→	→	12 33	12 43	12 51↓												
21B	21362			12 04	12 12	12 18	12 30	→	→	→	12 40	→	12 54↓									
21C	21364											12 29	→	12 39	12 49	13 04↓						
	1718									13 01	→	→	13 08	→	→	13 14	→	13 20	13 29	→	13 36	13 45
21D	21382			12 44	12 52	12 58	→	→	→	→	→	→	13 24↓									
	1020									13 31	→	→	13 38	→	→	13 44	→	13 50	13 59	→	14 06	14 15
21A	21400	13 11	→	→	→	→	→	13 33	13 43	13 51↓												
21B	21402			12 59	13 09	13 15	13 27	→	→	→	13 39	→	13 54↓									
21C	21404											13 30	→	13 40	13 50	14 05↓						
	1720									14 01	→	→	14 08	→	→	14 14	→	14 20	14 29	→	14 36	14 45
21D	21422			13 44	13 52	13 58	→	→	→	→	→	→	14 24↓									
	1022									14 31	→	→	14 38	→	→	14 44	→	14 50	14 59	→	15 06	15 15
21A	21440	14 11	→	→	→	→	→	14 33	14 43	14 51↓												

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)
EASTBOUND / EN DIRECTION EST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Milton 24 Dp Milton GO	Mississauga 22 Derry Rd. W. @ Ninth Line	Mississauga 23 Dp Lisgar GO	Mississauga 22 Aquitane Ave. @ Meadowvale Town Centre Circle	Mississauga 22 Meadowvale GO	Mississauga 21 Streetsville GO	Oakville 13 Trafalgar Rd. @ Hwy. 407	Oakville 12 Sheridan College	Oakville 13 Oakville GO	Mississauga 40 Erin Mills Transitway	Mississauga 40 Erindale GO	Mississauga 12 Clarkson GO	Mississauga 20 Dp Square One	Mississauga 11 Cooksville GO	Mississauga 10 Port Credit GO	Mississauga 11 Dixie GO	Etobicoke 59 Long Branch GO	Etobicoke 79 Mimico GO	Etobicoke 3 Kipling GO	Toronto 2 Exhibition GO	Toronto 2 Ar Union Station
21B	21442			13 59	14 09	14 15	14 27	→	→	→	14 39	→	14 54↓									
21C	21444											14 30	→	14 40	14 50	15 05↓						
	1722									15 01	→	→	15 08	→	→	15 15	→	15 20	15 29	→	15 36	15 45
21D	21462			14 39	14 49	14 55	→	→	→	→	→	→	15 24↓									
	1024									15 31	→	→	15 38	→	→	15 44	→	15 50	15 59	→	16 06	16 15
21A	21480	15 11	→	→	→	→	→	15 33	15 43	15 51↓												
21B	21482			14 55	15 05	15 11	15 23	→	→	→	15 35	→	15 50↓									
21C	21484											15 26	→	15 36	15 47	16 04↓						
	1724									16 01	→	→	16 08	→	→	16 14	→	16 20	16 29	→	16 36	16 45
21D	21512			15 39	15 49	15 55	→	→	→	→	→	→	16 24↓									
	1026									16 31	→	→	16 38	→	→	16 44	→	16 50	16 59	→	17 06	17 15
21A	21540	16 04	→	→	→	→	→	16 29	16 41	16 49↓												
21B	21542			15 56	16 06	16 12	16 24	→	→	→	16 36	→	16 51↓									
21C	21544											16 25	→	16 35	16 46	17 03↓						
	1726									16 59	→	→	17 06	→	→	17 13	→	17 19	16 29	→	17 36	17 45
21D	21572			16 40	16 50	16 56	→	→	→	→	→	→	17 25↓									
	1028									17 30	→	→	17 38	→	→	17 44	→	17 50	17 59	→	18 06	18 15
21A	21600	17 04	→	→	→	→	→	17 29	17 41	17 49↓												
21B	21602			16 52	17 02	17 08	17 22	→	→	→	17 36	→	17 52↓									
21C	21604											17 24	→	17 34	17 45	18 02↓						
	1728									17 59	→	→	18 06	→	→	18 12	→	18 19	18 28	→	18 36	18 45
21D	21632			17 37	17 47	17 53	→	→	→	→	→	→	18 22↓									
	1030									18 29	→	→	18 36	→	→	18 43	→	18 49	18 58	→	19 06	19 15
21A	21660	18 11	→	→	→	→	→	18 33	18 43	18 51↓												
21B	21662			17 58	18 08	18 14	18 26	→	→	→	18 38	→	18 53↓									
21C	21664											18 26	→	18 36	18 47	1904↓						
	1730									19 01	→	→	19 08	→	→	19 14	→	19 20	19 28	→	19 36	19 45
21D	21682			18 38	18 48	18 54	→	→	→	→	→	→	19 23↓									
	1032									19 30	→	→	19 37	→	→	19 43	→	19 49	19 58	→	20 06	20 15
21A	21700	19 10	→	→	→	→	→	19 32	19 42	19 50↓												
21B	21702			19 03	19 11	19 17	19 29	→	→	→	19 39	→	19 53↓									
21C	21704											19 28	→	19 38	19 48	20 03↓						
	1732									20 00	→	→	20 07	→	→	20 13	→	20 19	20 28	→	20 36	20 45
21D	21722			19 43	19 51	19 57	→	→	→	→	→	→	20 23↓									
	1034									20 30	→	→	20 37	→	→	20 43	→	20 49	20 58	→	21 06	21 15
21A	21740	20 10	→	→	→	→	→	20 32	20 42	20 50↓												
21B	21742			20 03	20 11	20 17	20 29	→	→	→	20 39	→	20 53↓									
21C	21744											20 28	→	20 38	20 48	21 03↓						
	1734									21 00	→	→	21 07	→	→	21 13	→	21 19	21 28	→	21 36	21 45
21A	21780	21 15	→	→	→	→	→	21 35	21 42	21 50↓												
21B	21782			21 03	21 11	21 17	21 29	→	→	→	21 39	→	21 53↓									
21C	21784											21 28	→	21 38	21 48	22 03↓						
	1736									22 00	→	→	22 07	→	→	22 13	→	22 19	22 28	→	22 36	22 45
21A	21820	22 15	→	→	→	→	→	22 35	22 42	22 50↓												
21B	21822			22 03	22 11	22 17	22 29	→	→	→	22 39	→	22 53↓									
21C	21824											22 32	→	22 41	22 51	2304↓						
	1738									23 00	→	→	23 07	→	→	23 13	→	23 19	23 28	→	23 36	23 45
21	21830	22 20	22 31	22 38	22 45	22 55	23 03	→	→	→	→	23 16	→	23 25	23 35	→	→	→	→	→	→	00 05
21	21860	23 25	23 35	23 42	23 48	23 55	18 15	→	→	→	→	00 16	→	00 25	00 35	→	→	→	→	→	→	01 05
21	21890	00 25	00 35	00 42	00 48	00 55	01 03	→	→	→	→	01 16	→	01 25	01 35	→	→	→	→	→	→	02 00

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)
WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Union Station (Toronto 2, Dp)	Exhibition GO (Toronto 2)	Kipling GO (Etobicoke 3)	Mimico GO (Etobicoke 79)	Long Branch GO (Etobicoke 59)	Dixie GO (Mississauga 11)	Port Credit GO (Mississauga 10)	Cooksville GO (Mississauga 11)	Square One (Mississauga 20)	Clarkson GO (Mississauga 12)	Erindale GO (Mississauga 40)	Erin Mills Transitway (Mississauga 40)	Oakville GO (Oakville 13)	Sheridan College (Oakville 12)	Trafalgar Rd. @ Hwy. 407 (Oakville 13)	Streetsville GO (Mississauga 21)	Meadowvale GO (Mississauga 22)	Aquitaine Ave. @ Formentera Ave. Meadowvale Town Centre (Mississauga 22)	Lisgar GO (Mississauga 23)	Derry Rd. W. @ Ninth Line (Mississauga 22)	Milton GO (Milton 24, Ar)
21	21051	05 40	→	→	→	→	→	→	06 02	06 14	→	06 23	→	→	→	→	06 38	06 51	06 53	07 01	07 09	07 25
	1005	06 12	05 25	→	06 26	06 32	→	06 38	→	→	06 45	→	→	06 52								
21A	21131													07 02h	07 10	07 22	→	→	→	→	→	07 47
21B	21133										06 55h	→	07 09	→	→	→	07 19	07 31	07 34	07 45		
21C	21135							06 48h	07 01	07 13	→	07 23										
	1705	06 42	06 49	→	06 56	07 02	→	07 08	→	→	07 15	→	→	07 22								
21D	21163										07 27h	→	→	→	→	→	→	07 57	08 00	08 12		
21C	21165							07 15h	07 28	07 40	→	07 50										
	1007	07 17	07 24	→	07 33	07 39	→	07 46	→	→	07 53	→	→	08 00								
21A	21191													08 10h	08 18	08 30	→	→	→	→	→	08 55
21B	21193										08 03h	→	08 20	→	→	→	08 32	08 47	08 50	09 03		
21C	21195							07 52h	08 05	08 18	→	08 30										
	1707	07 47	07 54	→	08 03	08 09	→	08 16	→	→	08 23	→	→	08 30								
21D	21223										08 33h	→	→	→	→	→	→	09 07	09 10	09 23		
21C	21225							08 26h	08 39	08 52	→	09 04										
	1009	08 17	08 24	→	08 33	08 39	→	08 46	→	→	08 53	→	→	09 00								
21A	21241													09 10h	09 18	09 30	→	→	→	→	→	09 55
21B	21243										09 03h	→	09 19	→	→	→	09 29	09 43	09 46	09 58		
21C	21245							08 56h	09 09	09 22	→	09 34										
	1709	08 47	08 54	→	09 03	09 09	→	09 16	→	→	09 23	→	→	09 30								
21D	21263										09 33h	→	→	→	→	→	→	09 59	10 02	10 13		
21C	21265							09 26h	09 39	09 51	→	10 01										
	1011	09 17	09 24	→	09 33	09 39	→	09 46	→	→	09 53	→	→	10 00								
21A	21281													10 10h	10 18	10 28	→	→	→	→	→	10 50
21B	21283										10 03h	→	10 17	→	→	→	10 27	10 39	10 42	10 53		
	1711	09 47	09 54	→	10 03	10 09	→	10 16	→	→	10 23	→	→	10 30								
21D	21303										10 33h	→	→	→	→	→	→	10 59	11 02	11 13		
21C	21305							10 26h	10 39	10 51	→	11 01										
	1013	10 17	10 24	→	10 33	10 39	→	10 46	→	→	10 53	→	→	11 00								
21A	21321													11 10h	11 18	11 28	→	→	→	→	→	11 50
21B	21323										11 03h	→	11 17	→	→	→	11 27	11 39	11 42	11 53		
	1713	10 47	10 54	→	11 03	11 09	→	11 16	→	→	11 23	→	→	11 30								
21D	21343										11 33h	→	→	→	→	→	→	11 59	12 02	12 13		
21C	21345							11 26h	11 39	11 51	→	12 01										
	1015	11 17	11 24	→	11 33	11 39	→	11 46	→	→	11 53	→	→	12 00								
21A	21361													12 10h	12 18	12 28	→	→	→	→	→	12 50
21B	21363										12 03h	→	12 17	→	→	→	12 27	12 39	12 42	12 53		
	1715	11 47	11 54	→	12 03	12 09	→	12 16	→	→	12 23	→	→	12 30								
21D	21383										12 33h	→	→	→	→	→	→	12 59	13 02	13 13		
21C	21385							12 25h	12 38	12 50	→	13 00										
	1017	12 17	12 24	→	12 33	12 39	→	12 46	→	→	12 53	→	→	13 00								
21A	21401													13 10h	13 18	13 28	→	→	→	→	→	13 50
21B	21403										13 03h	→	13 17	→	→	→	13 27	13 39	13 42	13 53		
	1717	12 47	12 54	→	13 03	13 09	→	13 16	→	→	13 23	→	→	13 30								
21D	21423										13 33h	→	→	→	→	→	→	14 03	14 06	14 18		
21C	21425							13 26h	13 39	13 51	→	14 01										
	1019	13 17	13 24	→	13 33	13 39	→	13 46	→	→	13 53	→	→	14 00								
21A	21441													14 10h	14 18	14 30	→	→	→	→	→	14 55
21B	21443										14 03h	→	14 19	→	→	→	14 29	14 43	14 46	14 58		
	1719	13 47	13 54	→	14 03	14 09	→	14 16	→	→	14 23	→	→	14 30								
21D	21463										14 33h	→	→	→	→	→	→	15 03	15 06	15 18		
21C	21465							14 26h	14 39	14 52	→	15 04										
	1021	14 17	14 24	→	14 33	14 39	→	14 46	→	→	14 53	→	→	15 00								
21A	21481													15 10h	15 18	15 30	→	→	→	→	→	15 55

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)
WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Union Station (Toronto 2, Dp)	Exhibition GO (Toronto 2)	Kipling GO (Etobicoke 3)	Mimico GO (Etobicoke 79)	Long Branch GO (Etobicoke 59)	Dixie GO (Mississauga 11)	Port Credit GO (Mississauga 10)	Cooksville GO (Mississauga 11)	Square One (Mississauga 20)	Clarkson GO (Mississauga 12)	Erindale GO (Mississauga 40)	Erin Mills Transitway (Mississauga 40)	Oakville GO (Oakville 13)	Sheridan College (Oakville 12)	Trafalgar Rd. @ Hwy. 407 (Oakville 13)	Streetsville GO (Mississauga 21)	Meadowvale GO (Mississauga 22)	Aquitaine Ave. @ Formentera Ave. Meadowvale Town Centre (Mississaug 22)	Lisgar GO (Mississauga 23)	Derry Rd. W. @ Ninth Line (Mississauga 22)	Milton GO (Milton 24, Ar)
21B	21483										15 03h	→	15 20	→	→	→	15 32	15 47	15 50	16 03		
	1721	14 47	14 54	→	15 03	15 09	→	15 16	→	→	15 23	→	→	15 30								
21D	21513										15 33h	→	→	→	→	→	→	16 07	16 10	16 23		
21C	21515							15 26h	15 39	15 52	→	16 04										
	2723	15 40	→	15 58	→	→	16 04	→	16 10	→	→	16 16	→	→	→	→	16 21	16 28	→	16 33	→	16 42
	2729	16 25	→	16 43	→	→	16 49	→	16 55	→	→	17 01	→	→	→	→	17 06	17 13	→	17 18	→	17 27
	2735	16 55	→	17 13	→	→	17 19	→	17 25	→	→	17 31	→	→	→	→	17 36	17 43	→	17 48	→	17 57
	2737	17 10	→	17 28	→	→	17 34	→	17 40	→	→	17 46	→	→	→	→	17 51	17 58	→	18 03	→	18 12
	2739	17 25	→	17 43	→	→	17 49	→	17 55	→	→	18 01	→	→	→	→	18 06	18 13	→	18 18	→	18 27
	2741	17 55	→	18 13	→	→	18 19	→	18 25	→	→	18 31	→	→	→	→	18 36	18 43	→	18 48	→	18 57
	2745	18 25	→	18 43	→	→	18 49	→	18 55	→	→	19 01	→	→	→	→	19 06	19 13	→	19 18	→	19 27
	2749	19 10	→	19 28	→	→	19 34	→	19 40	→	→	19 46	→	→	→	→	19 51	19 58	→	20 03	→	20 12
	1731	19 47	19 55	→	20 04	20 10	→	20 17	→	→	20 24	→	→	20 31								
21A	21761													20 41h	20 49	20 59	→	→	→	→	→	21 21
21D	21763										20 34h	→	→	→	→	→	→	21 00	21 03	21 14		
21C	21765							20 27h	20 40	20 52	→	21 02										
	1033	20 17	20 25	→	20 34	20 40	→	20 47	→	→	20 54	→	→	21 01								
21A	21781													21 11h	21 19	21 29	→	→	→	→	→	21 51
21B	21783										21 04h	→	21 18	→	→	→	21 28	21 40	21 43	21 54		
21C	21785							20 57h	21 10	21 22	→	21 32										
	1733	20 47	20 55	→	21 04	21 10	→	21 17	→	→	21 24	→	→	21 31								
21A	21801													21 36h	21 44	21 54	→	→	→	→	→	22 16
21D	21803										21 34h	→	→	→	→	→	→	22 00	22 03	22 14		
21C	21805							21 27h	21 40	21 52	→	22 02										
	1035	21 17	21 25	→	21 34	21 40	→	21 47	→	→	21 54	→	→	22 01								
21A	21821													22 11h	22 19	22 29	→	→	→	→	→	22 51
21B	21823										22 04h	→	22 18	→	→	→	22 28	22 40	22 43	22 54		
21C	21825							21 57h	22 10	22 22	→	22 32										
	1735	21 47	21 55	→	22 04	22 10	→	22 17	→	→	22 24	→	→	22 31								
21A	21831													22 36h	22 44	22 54	→	→	→	→	→	23 16
21D	21833										22 34h	→	→	→	→	→	→	23 00	230 03	23 14		
21C	21835							22 27h	22 39	22 49	→	22 59										
	1037	22 17	22 25	→	22 34	22 40	→	22 47	→	→	22 54	→	→	23 01								
21B	21853										23 04h	→	23 10	→	→	→	23 28	23 40	23 43	23 54		
21C	21855							22 57h	23 09	23 19	→	23 29										
	1737	22 47	22 55	→	23 04	23 10	→	23 17	→	→	23 24	→	→	23 31								
21A	21861													23 40h	23 47	23 54	→	→	→	→	→	00 15
21D	21863										23 34h	→	→	→	→	→	→	00 00	00 03	00 14		
21C	21865							23 27h	23 39	23 49	→	23 59										
	1039	23 17	23 25	→	23 34	23 40	→	23 47	→	→	23 54	→	→	00 01								
21B	21883										00 04h	→	00 18	→	→	→	00 28	00 40	00 43	00 54		
21C	21885							23 57h	00 09	00 19	→	00 29										
	1739	23 47	23 55	→	00 04	00 10	→	00 17	→	→	00 24	→	→	00 31								
21A	21891													00 43h	00 50	00 57	→	→	→	→	→	01 18
21D	21893										00 35h	→	→	→	→	→	→	01 02	01 05	01 16		
21C	21895							00 29h	00 41	00 51	→	01 01										
21	21901	00 25	→	→	→	→	→	→	00 47	00 59	→	01 08	→	→	→	→	01 20	01 28	01 30	01 37	01 44	02 00
21	21921	01 20	→	→	→	→	→	→	01 40	01 50	→	01 58	→	→	→	→	02 10	02 18	02 20	02 27	02 34	02 50
21	21951	02 20	→	→	→	→	→	→	02 40	02 48	→	02 56	→	→	→	→	03 08	03 16	03 18	03 25	03 32	03 45

Saturday and Sunday
Samedi et dimanche
EASTBOUND / EN DIRECTION EST

Route Number Numéro du trajet	Zone→ Trip Number Numéro du parcours	Milton 24 Dp Milton GO	Mississauga 22 Derry Rd. W. @ Ninth Line	Mississauga 23 Dp Lisgar GO	Mississauga 22 Aquitaine Ave. @ Meadowvale Town Centre Circle	Mississauga 22 Meadowvale GO	Mississauga 21 Streetsville GO	Oakville 13 Trafalgar Rd. @ Hwy. 407	Oakville 12 Sheridan College	Oakville 13 Oakville GO	Mississauga 40 Erin Mills Transitway	Mississauga 40 Erindale GO	Mississauga 12 Clarkson GO	Mississauga 20 Dp Square One	Mississauga 11 Cooksville GO	Mississauga 10 Port Credit GO	Etobicoke 59 Long Branch GO	Etobicoke 79 Mimico GO	Etobicoke 3 Kipling GO	Toronto 2 Exhibition GO	Toronto 2 Ar Union Station
21	21040	04 55	05 05	05 12	05 18	05 25	05 33	→	→	→	→	05 46	→	05 55	06 05	→	→	→	→	→	06 30
21	21090	05 55	06 05	06 12	06 18	06 25	06 33	→	→	→	→	06 46	→	06 55	07 05	→	→	→	→	→	07 30
21A	21140	07 14	→	→	→	→	→	07 34	07 41	07 49↓											
21B	21142			07 11	07 16	07 22	07 32	→	→	→	07 42	→	07 56↓								
21C	21144											07 31	→	07 40	07 50	08 03↓					
	1708									07 59	→	→	08 06	→	→	08 13	08 19	08 28	→	08 36	08 45
21A	21170	07 44	→	→	→	→	→	08 04	08 11	08 19↓											
21B	21172			07 37	07 42	07 48	07 58	→	→	→	08 08	→	08 22↓								
	1010									08 29	→	→	08 36	→	→	08 43	08 49	08 58	→	09 06	09 15
21C	21204											08 31	→	08 40	08 50	09 03↓					
	1710									08 59	→	→	09 06	→	→	09 13	09 19	09 28	→	09 36	09 45
21A	21230	08 41	→	→	→	→	→	09 01	09 11	09 19↓											
21B	21232			08 38	08 44	08 50	09 02	→	→	→	09 14	→	09 28↓								
	1012									09 29	→	→	09 36	→	→	09 43	09 49	09 58	→	10 06	10 15
21C	21254											09 31	→	09 40	09 50	10 03↓					
	1712									09 59	→	→	10 06	→	→	10 13	10 19	10 28	→	10 36	10 45
21A	21270	09 41	→	→	→	→	→	10 01	10 11	10 19↓											
21B	21272			09 32	09 38	09 44	09 56	→	→	→	10 08	→	10 228↓								
21C	21274											09 58	→	10 08	10 18	10 33↓					
	1014									10 29	→	→	10 36	→	→	10 43	10 49	10 58	→	11 06	11 15
21C	21294											10 28	→	10 38	10 48	11 03↓					
	1714									10 59	→	→	11 06	→	→	11 13	11 19	11 28	→	11 36	11 45
21A	21310	10 41	→	→	→	→	→	11 01	11 11	11 19↓											
21B	21312			10 32	10 38	10 44	10 56	→	→	→	11 08	→	11 22↓								
21C	21314											10 58	→	11 08	11 18	11 33↓					
	1016									11 29	→	→	11 36	→	→	11 43	11 49	11 58	→	12 06	12 15
21C	21334											11 29	→	11 39	11 49	12 04↓					
	1716									11 59	→	→	12 06	→	→	12 13	12 19	12 28	→	12 36	12 45
21A	21350	11 41	→	→	→	→	→	12 01	12 11	12 19↓											
21B	21352			11 32	11 38	11 44	11 56	→	→	→	12 08	→	12 22↓								
21C	21354											11 55	→	12 05	12 16	12 33↓					
	1018									12 29	→	→	12 36	→	→	12 43	12 49	12 58	→	13 06	13 15
21C	21374											12 25	→	12 35	12 46	13 03↓					
	1718									12 59	→	→	13 06	→	→	13 13	13 19	13 28	→	13 36	13 45
21A	21390	12 39	→	→	→	→	→	13 01	13 11	13 19↓											
21B	21392			12 32	12 38	12 44	12 56	→	→	→	13 08	→	13 22↓								
21C	21394											12 55	→	13 05	13 16	13 33↓					
	1020									13 29	→	→	13 36	→	→	13 43	13 49	13 58	→	14 06	14 15
21C	21414											13 25	→	13 35	13 46	14 03↓					
	1720									13 59	→	→	14 06	→	→	14 13	14 19	14 28	→	14 36	14 45
21A	21430	13 39	→	→	→	→	→	14 01	14 11	14 19↓											
21B	21432			13 32	13 38	13 44	13 56	→	→	→	14 08	→	14 22↓								
21C	21434											13 55	→	14 05	14 16	14 33↓					
	1022									14 29	→	→	14 36	→	→	14 43	14 49	14 58	→	15 06	15 15
21C	21454											14 26	→	14 36	14 47	15 04↓					
	1722									14 59	→	→	15 06	→	→	15 13	15 19	15 28	→	15 36	15 45

Saturday and Sunday
Samedi et dimanche
EASTBOUND / EN DIRECTION EST

Route Number Numéro du trajet	Zone→ Trip Number Numéro du parcours	Milton 24 Dp Milton GO	Mississauga 22 Derry Rd. W. @ Ninth Line	Mississauga 23 Dp Lisgar GO	Mississauga 22 Aquitaine Ave. @ Meadowvale Town Centre Circle	Mississauga 22 Meadowvale GO	Mississauga 21 Streetsville GO	Oakville 13 Trafalgar Rd. @ Hwy. 407	Oakville 12 Sheridan College	Oakville 13 Oakville GO	Mississauga 40 Erin Mills Transitway	Mississauga 40 Erindale GO	Mississauga 12 Clarkson GO	Mississauga 20 Dp Square One	Mississauga 11 Cooksville GO	Mississauga 10 Port Credit GO	Etobicoke 59 Long Branch GO	Etobicoke 79 Mimico GO	Etobicoke 3 Kipling GO	Toronto 2 Exhibition GO	Toronto 2 Ar Union Station
21A	21470	14 39	→	→	→	→	→	15 01	15 11	15 19↓											
21B	21472			14 32	14 38	14 44	14 56	→	→	→	15 08	→	15 22↓								
21C	21474											14 55	→	15 05	15 16	15 33↓					
	1024									15 29	→	→	15 36	→	→	15 43	15 49	15 58	→	16 06	16 15
21C	21494											15 25	→	15 35	15 46	16 03↓					
	1724									15 59	→	→	16 06	→	→	16 13	16 19	16 28	→	16 36	16 45
21A	21520	15 39	→	→	→	→	→	16 01	16 11	16 19↓											
21B	21522			15 32	15 38	15 44	15 56	→	→	→	16 08	→	16 22↓								
21C	21524											15 55	→	16 05	16 16	16 33↓					
	1026									16 29	→	→	16 36	→	→	16 43	16 49	16 58	→	17 06	17 15
21C	21554											16 25	→	16 35	16 46	17 03↓					
	1726									16 59	→	→	17 06	→	→	17 13	17 19	17 28	→	17 36	17 45
21A	21580	16 39	→	→	→	→	→	17 01	17 11	17 19↓											
21B	21582			16 32	16 38	16 44	16 56	→	→	→	17 08	→	17 22↓								
21C	21584											16 55	→	17 05	17 16	17 33↓					
	1028									17 29	→	→	17 36	→	→	17 43	17 49	17 58	→	18 06	18 15
21C	21614											17 25	→	17 35	17 46	18 03↓					
	1728									17 59	→	→	18 06	→	→	18 13	18 19	18 28	→	18 36	18 45
21A	21640	17 39	→	→	→	→	→	18 01	18 11	18 19↓											
21B	21642			17 32	17 38	17 44	17 56	→	→	→	18 08	→	18 22↓								
21C	21644											17 55	→	18 05	18 16	18 33↓					
	1030									18 29	→	→	18 36	→	→	18 43	18 49	18 58	→	19 06	19 15
21C	21674											18 25	→	18 35	18 46	19 03↓					
	1730									18 59	→	→	19 06	→	→	19 13	19 19	19 28	→	19 36	19 45
21A	21690	18 39	→	→	→	→	→	19 01	19 11	19 19↓											
21B	21692			18 32	18 38	18 44	18 56	→	→	→	19 08	→	19 22↓								
	1032									19 29	→	→	19 36	→	→	19 43	19 49	19 58	→	20 03	20 15
21C	21714											19 28	→	19 38	19 48	20 03↓					
	1732									19 59	→	→	20 06	→	→	20 13	20 19	20 28	→	20 36	20 45
21A	21730	19 41	→	→	→	→	→	20 01	20 11	20 19↓											
21B	21732			19 32	19 38	19 44	19 56	→	→	→	20 08	→	20 22↓								
	1034									20 29	→	→	20 36	→	→	20 43	20 49	20 58	→	21 06	21 15
21C	21754											20 29	→	20 39	20 49	21 04↓					
	1734									20 59	→	→	21 06	→	→	21 13	21 19	21 28	→	21 36	21 45
21A	21770	20 41	→	→	→	→	→	21 01	21 11	21 19↓											
21B	21772			20 32	20 38	20 44	20 56	→	→	→	21 08	→	21 22↓								
	1036									21 29	→	→	21 36	→	→	21 43	21 49	21 58	→	22 06	22 15
21C	21794											21 31	→	21 40	21 50	22 03↓					
	1736									21 59	→	→	22 06	→	→	22 13	22 19	22 28	→	22 36	22 45
21A	21800	21 45	→	→	→	→	→	22 05	22 12	22 20↓											
21B	21802			21 32	21 38	21 44	21 56	→	→	→	22 08	→	22 22↓								
	1038									22 29	→	→	22 37	→	→	22 44	22 50	22 57	→	23 06	23 18
21C	21824											22 31	→	22 40	22 50	23 03↓					
	1738									22 59	→	→	23 06	→	→	23 13	23 19	23 28	→	23 36	23 45
21	21830	22 35	22 46	22 53	23 00	23 08	23 16	→	→	→	→	23 29	→	23 38	23 48	→	→	→	→	→	00 15
21	21860	23 25	23 36	23 43	23 50	23 58	00 06	→	→	→	→	00 19	→	00 28	00 38	→	→	→	→	→	01 05
21	21890	00 30	00 40	00 47	00 53	01 00	01 08	→	→	→	→	01 21	→	01 30	01 40	→	→	→	→	→	02 05

Saturday and Sunday
Samedi et dimanche
WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Union Station (Toronto 2) Dp	Exhibition GO (Toronto 2)	Kipling GO (Etobicoke 3)	Mimico GO (Etobicoke 79)	Long Branch GO (Etobicoke 59)	Port Credit GO (Mississauga 10)	Cooksville GO (Mississauga 11)	Square One (Mississauga 20)	Clarkson GO (Mississauga 12)	Erindale GO (Mississauga 40)	Erin Mills Transitway (Mississauga 40)	Oakville GO (Oakville 13)	Sheridan College (Oakville 12)	Trafalgar Rd. @ Hwy. 407 (Oakville 13)	Streetsville GO (Mississauga 21)	Meadowvale GO (Mississauga 22)	Aquitaine Ave. @ Formentera Ave. Meadowvale Town Centre (Mississauga 22)	Lisgar GO (Mississauga 23)	Derry Rd. W. @ Ninth Line (Mississauga 22)	Milton GO (Milton 24) Ar
21	21151	07 30	→	→	→	→	→	07 52	08 04	→	08 12	→	→	→	→	08 25	08 35	08 37	08 45	08 53	09 15
	1709	08 44	08 52	→	09 01	09 07	09 14	→	→	09 21	→	→	09 28								
21A	21261												09 38h	09 46	09 56	→	→	→	→	→	10 18
21B	21263									09 31h	→	09 45	→	→	→	09 55	10 07	10 10	10 21		
21C	21265						09 24h	09 36	09 46	→	09 56										
	1011	09 14	09 22	→	09 31	09 37	09 44	→	→	09 51	→	→	09 58								
	1711	09 44	09 52	→	10 01	10 07	10 14	→	→	10 21	→	→	10 28								
21A	21301												10 38h	10 46	10 56	→	→	→	→	→	11 18
21B	21303									10 31h	→	10 45	→	→	→	10 55	11 07	11 10	11 21		
21C	21305						10 24h	10 37	10 49	→	10 59										
	1013	10 14	10 22	→	10 31	10 37	10 44	→	→	10 51	→	→	10 58								
	1713	10 44	10 52	→	11 01	11 07	11 14	→	→	11 21	→	→	11 28								
21A	21341												11 38h	11 46	11 56	→	→	→	→	→	12 18
21B	21343									11 31h	→	11 45	→	→	→	11 55	12 07	12 10	12 21		
21C	21345						11 24h	11 37	11 49	→	11 59										
	1015	11 14	11 22	→	11 31	11 37	11 44	→	→	11 51	→	→	11 58								
21C	21365						11 54h	12 07	12 19	→	12 29										
	1715	11 44	11 52	→	12 01	12 07	12 14	→	→	12 21	→	→	12 28								
21A	21381												12 38h	12 46	12 58	→	→	→	→	→	13 21
21B	21383									12 31h	→	12 47	→	→	→	12 57	13 11	13 14	13 26		
21C	21385						12 24h	12 37	12 50	→	13 02										
	1017	12 14	12 22	→	12 31	12 37	12 44	→	→	12 51	→	→	12 58								
21C	21405						12 54h	13 07	13 20	→	13 32										
	1717	12 44	12 52	→	13 01	13 07	13 14	→	→	13 21	→	→	13 28								
21A	21421												13 38h	13 46	13 58	→	→	→	→	→	14 21
21B	21423									13 31h	→	13 47	→	→	→	13 57	14 11	14 14	14 26		
21C	21425						13 18h	13 31	13 44	→	13 56										
	1019	13 14	13 22	→	13 31	13 37	13 44	→	→	13 51	→	→	13 58								
21C	21445						13 54h	14 07	14 20	→	14 32										
	1719	13 44	13 52	→	14 01	14 07	14 14	→	→	14 21	→	→	14 28								
21A	21461												14 38h	14 46	14 58	→	→	→	→	→	15 21
21B	21463									14 31h	→	14 47	→	→	→	14 57	15 11	15 14	15 26		
21C	21465						14 24h	14 37	14 50	→	15 02										
	1021	14 14	14 22	→	14 31	14 37	14 44	→	→	14 51	→	→	14 58								
21C	21485						14 54h	15 07	15 20	→	15 32										
	1721	14 44	14 52	→	15 01	15 07	15 14	→	→	15 21	→	→	15 28								
21A	21511												15 38h	15 46	15 58	→	→	→	→	→	16 21
21B	21513									15 31h	→	15 47	→	→	→	15 57	16 11	16 14	16 26		
21C	21515						15 24h	15 37	15 50	→	16 02										
	1023	15 14	15 22	→	15 31	15 37	15 44	→	→	15 51	→	→	15 58								
21C	21545						15 54h	16 07	16 20	→	16 32										
	1723	15 44	15 52	→	16 01	16 07	16 14	→	→	16 21	→	→	16 28								
21A	21571												16 38h	16 46	16 58	→	→	→	→	→	17 21
21B	21573									16 31h	→	16 47	→	→	→	16 57	17 11	17 14	17 26		
21C	21575						16 24h	16 37	16 50	→	17 02										
	1025	16 14	16 22	→	16 31	16 37	16 44	→	→	16 51	→	→	16 58								
21C	21605						16 54h	17 07	17 20	→	17 32										
	1725	16 44	16 52	→	17 01	17 07	17 14	→	→	17 21	→	→	17 28								

Saturday and Sunday
Samedi et dimanche
WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Union Station (Toronto 2) Dp	Exhibition GO (Toronto 2)	Kipling GO (Etobicoke 3)	Mimico GO (Etobicoke 79)	Long Branch GO (Etobicoke 59)	Port Credit GO (Mississauga 10)	Cooksville GO (Mississauga 11)	Square One (Mississauga 20)	Clarkson GO (Mississauga 12)	Erindale GO (Mississauga 40)	Erin Mills Transitway (Mississauga 40)	Oakville GO (Oakville 13)	Sheridan College (Oakville 12)	Trafalgar Rd. @ Hwy. 407 (Oakville 13)	Streetsville GO (Mississauga 21)	Meadowvale GO (Mississauga 22)	Aquitaine Ave. @ Formentera Ave. Meadowvale Town Centre (Mississauga 22)	Lisgar GO (Mississauga 23)	Derry Rd. W. @ Ninth Line (Mississauga 22)	Milton GO (Milton 24) Ar
21A	21631												17 38h	17 46	17 58	→	→	→	→	→	18 21
21B	21633									17 31h	→	17 47	→	→	→	17 57	18 11	18 14	18 26		
21C	21635						17 24h	17 37	17 50	→	18 02										
	1027	17 14	17 22	→	17 31	17 37	17 45	→	→	17 53	→	→	18 01								
21C	21665						17 55	18 08	18 21	→	18 33										
	1727	17 44	17 52	→	18 01	18 07	18 15	→	→	18 23	→	→	18 31								
21A	21681												18 41h	18 49	18 59	→	→	→	→	→	19 21
21B	21683									18 33h	→	18 47	→	→	→	18 57	19 09	19 12	19 23		
21C	21685						18 25h	18 38	18 51	→	19 03										
	1029	18 14	18 22	→	18 31	18 37	18 45	→	→	18 53	→	→	19 01								
21C	21705						18 55h	19 08	19 21	→	19 33										
	1729	18 44	18 52	→	19 01	19 07	19 15	→	→	19 23	→	→	19 31								
21A	21721												19 41h	19 49	19 59	→	→	→	→	→	20 21
21B	21723									19 33h	→	19 47	→	→	→	19 57	20 09	20 12	20 23		
21C	21725						19 21h	19 34	19 47	→	19 59										
	1031	19 14	19 22	→	19 31	19 37	19 45	→	→	19 53	→	→	20 01								
21C	21745						19 55h	20 08	20 21	→	20 33										
	1731	19 44	19 52	→	20 01	20 07	20 15	→	→	20 23	→	→	20 31								
21A	21761												20 35h	20 43	20 53	→	→	→	→	→	21 15
21B	21763									20 33h	→	20 47	→	→	→	20 57	21 09	21 12	21 23		
21C	21765						20 25h	20 38	20 50	→	21 00										
	1033	20 14	20 22	→	20 31	20 37	20 45	→	→	20 53	→	→	21 01								
21C	21785						20 55h	21 08	21 20	→	21 30										
	1733	20 44	20 52	→	21 01	21 07	21 15	→	→	21 23	→	→	21 31								
21A	21801												21 41h	21 49	21 58	→	→	→	→	→	22 19
21B	21803									21 33h	→	21 47	→	→	→	21 57	22 09	22 12	22 23		
21C	21805						21 25h	21 38	21 50	→	22 00										
	1035	21 14	21 22	→	21 31	21 37	21 44	→	→	21 51	→	→	21 59								
21C	21825						21 54h	22 07	22 19	→	22 29										
	1735	21 44	21 52	→	22 01	22 07	22 14	→	→	22 21	→	→	22 28								
21A	21831												22 38h	22 46	22 55	→	→	→	→	→	23 16
21B	21833									22 30h	→	22 44	→	→	→	22 54	23 06	23 09	23 20		
21C	21835						22 24h	22 37	22 49	→	22 59										
	1037	22 14	22 22	→	22 31	22 37	22 45	→	→	22 53	→	→	23 01								
21C	21855						22 55h	23 07	23 17	→	23 27										
	1737	22 44	22 52	→	23 01	23 07	23 15	→	→	23 23	→	→	23 31								
21A	21861												23 41h	23 48	23 55	→	→	→	→	→	00 16
21B	21863									23 33h	→	23 47	→	→	→	23 57	00 09	00 12	00 23		
21C	21865						23 25h	23 37	23 47	→	23 57										
	1039	23 14	23 22	→	23 31	23 37	23 45	→	→	23 53	→	→	00 01								
21C	21885						23 55h	00 07	00 17	→	00 27										
	1739	23 45	23 53	→	00 02	00 07	00 15	→	→	00 23	→	→	00 31								
21A	21891												00 43h	00 50	00 57	→	→	→	→	→	01 18
21B	21893									00 35h	→	00 49	→	→	→	00 59	01 11	01 14	01 25		
21C	21895						00 27h	00 39	00 49	→	00 59										
	1041	00 15	00 23	→	00 32	00 38	00 45	→	→	00 52	→	→	00 59								
21	21901	00 50	→	→	→	→	→	01 12	01 24	→	01 32	→	→	→	→	01 45	01 55	01 57	02 04	02 11	02 30
21	21921	01 20	→	→	→	→	→	01 40	01 52	→	02 00	→	→	→	→	02 13	02 23	02 25	02 32	02 39	02 55
21	21951	02 20	→	→	→	→	→	02 40	02 48	→	02 56	→	→	→	→	03 08	03 16	03 18	03 25	03 32	03 45

Detailed ridership map released for GO and UP Express stations

Ridership increased to 52.5 million in November – Find where you and your neighbours fit.

Jan 30, 2019

More customers than ever before are bee-lining it to Barrie via GO Transit, or stops along its line, according to the latest ridership numbers released this week by Metrolinx.

The transit agency saw ridership on GO Transit and the UP Express jump to 52.5 million from April to November last year. Barrie GO train corridor saw the strongest growth of the entire GO network at 21 per cent, compared to the same time the year before.

The numbers are part of a detailed map Metrolinx has now released, breaking down ridership across the Greater Golden Horseshoe region. Take a look at how your local station compared.

CLICK RIGHT HERE FOR OUR RIDERSHIP MAP

“With our renewed focus to put the customers first, our team is increasing service to help provide new reasons for our customers to travel with us no matter their trip purpose or destination,” said Mark Childs, chief marketing officer for Metrolinx.

Childs said the Barrie line’s ridership growth is due in part to customer satisfaction from increased train service, introduction of the new Downsview Park GO station and the Barrie Kids GO Free pilot implemented last spring.

Childs noted the Barrie Kids GO Free pilot contributed 63,000 incremental boardings.

Ridership on Lakeshore East and West also grew five per cent and three per cent respectively. More midday trips were added to both lines in September.

Meanwhile, travellers and commuters used the UP Express in record numbers. Boardings grew 16 per cent from April to November, compared to the same time the year before.

Childs said a pilot with Uber, along with a new advertising campaign highlighting the 25-minute journey, helped grow UP Express ridership.

“The Uber partnership and pilot has already proven itself in extending the reach to and from our stations, that all important ‘first mile last mile’ destination connectivity,” Childs said.

Since the start of that Uber pilot last fall, UP Express ridership has grown from seven per cent in September 2018 to 15 per cent in November.

by **Amanda Ferguson** Metrolinx senior advisor media relations & issues

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Recent News

Family Day fun in Niagara Falls with year-round GO Train service

Daily direct departures from Toronto to Niagara Falls continue seven days a week throughout winter.

Survey monuments across GO network support future construction

Metrolinx continues to make headway on the regional transformation of the GO rail network.

Special GO Bus & pop-up market kick off Black History Month

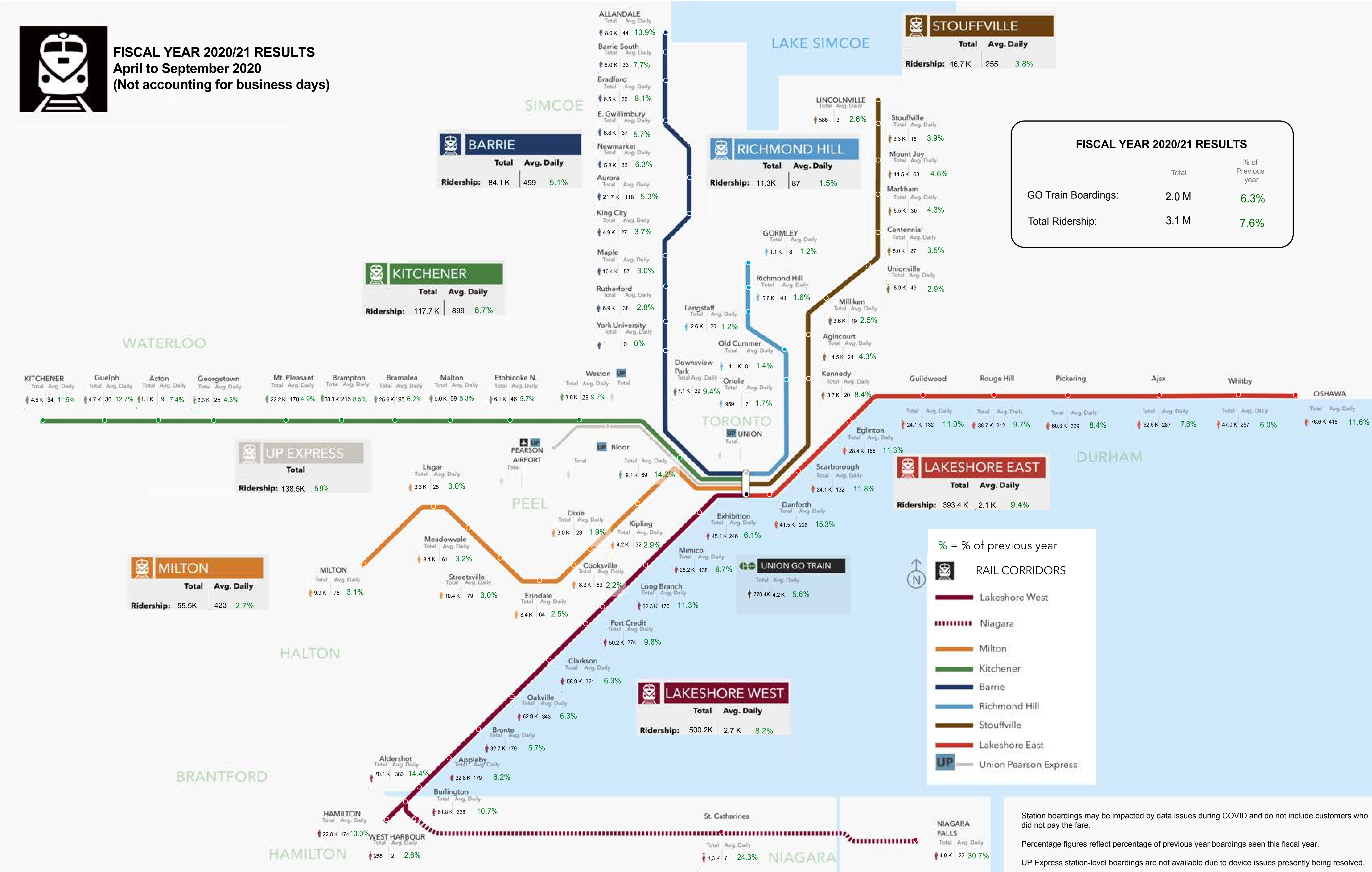
Metrolinx commemorates Black History Month & celebrates contributions by Ontario’s Black community.

GO statio the extra

During rece Nick Scount hundreds fi hour.

Metrolinx, an agency of the **Ontario Government** under the Metrolinx Act, 2006, was created to improve the coordination and integration of transportation in the **Greater Toronto and Hamilton Area** alongside the **Ministry of Transportation**.

97 Front Street West, Toronto, ON M5J 1E6, Phone: 416-874-5900



FISCAL YEAR 2020/21 RESULTS
April to September 2020
(Not accounting for business days)
LAKE SIMCOE
SIMCOE
WATERLOO
PEEL
HALTON
DURHAM
BRANTFORD
HAMILTON
NIAGARA
TORONTO
STOUFFVILLE Total Avg. Daily Ridership: 46.7 K 255 3.8%
BARRIE Total Avg. Daily Ridership: 84.1 K 459 5.1%
RICHMOND HILL Total Avg. Daily Ridership: 11.3K 87 1.5%
KITCHENER Total Avg. Daily Ridership: 117.7 K 899 6.7%
UP EXPRESS Total Ridership: 138.5K 5.9%
MILTON Total Avg. Daily Ridership: 55.5K 423 2.7%
LAKESHORE EAST Total Avg. Daily Ridership: 393.4 K 2.1 K 9.4%
LAKESHORE WEST Total Avg. Daily Ridership: 500.2K 2.7 K 8.2%
UNION GO TRAIN Total Avg. Daily 770.4K 4.2 K 5.6%
FISCAL YEAR 2020/21 RESULTS
Total | % of Previous year
GO Train Boardings: 2.0 M 6.3%
Total Ridership: 3.1 M 7.6%
ALLANDALE 8.0K 44 13.9%
Barrie South 6.0K 33 7.7%
Bradford 6.5K 36 8.1%
E. Gwillimbury 6.8K 37 5.7%
Newmarket 5.8K 32 6.3%
Aurora 21.7K 118 5.3%
King City 4.9K 27 3.7%
Maple 10.4K 57 3.0%
Rutherford 6.9K 38 2.8%
York University 1 0 0%
Downsview Park 7.1K 39 9.4%
LINCOLNVILLE 586 3 2.6%
Stouffville 3.3K 18 3.9%
Mount Joy 11.5K 63 4.6%
Markham 5.5K 30 4.3%
Centennial 5.0K 27 3.5%
Unionville 8.9K 49 2.9%
Milliken 3.6K 19 2.5%
Agincourt 4.5K 24 4.3%
Kennedy 3.7K 20 8.4%
GORMLEY 1.1K 8 1.2%
Richmond Hill 5.6K 43 1.6%
Langstaff 2.6K 20 1.2%
Old Cummer 1.1K 8 1.4%
Oriole 959 7 1.7%
KITCHENER 4.5K 34 11.5%
Guelph 4.7K 36 12.7%
Acton 1.1K 9 7.4%
Georgetown 3.3K 25 4.3%
Mt. Pleasant 22.2K 170 4.9%
Brampton 28.3K 216 8.5%
Bramalea 25.6K 195 6.2%
Malton 9.0K 69 5.3%
Etobicoke N. 6.1K 46 5.7%
Weston 3.8K 29 9.7%
PEARSON AIRPORT
Bloor 9.1K 69 14.2%
UNION
Lisgar 3.3K 25 3.0%
Meadowvale 8.1K 61 3.2%
Streetsville 10.4K 79 3.0%
Erindale 8.4K 64 2.5%
Cooksville 8.3K 63 2.2%
Dixie 3.0K 23 1.9%
Kipling 4.2K 32 2.9%
MILTON 9.9K 75 3.1%
Guildwood 24.1K 132 11.0%
Rouge Hill 38.7K 212 9.7%
Pickering 60.3K 329 8.4%
Ajax 52.6K 287 7.6%
Whitby 47.0K 257 6.0%
OSHAWA 76.6K 418 11.6%
Eglinton 28.4K 155 11.3%
Scarborough 24.1K 132 11.8%
Danforth 41.5K 226 15.3%
Exhibition 45.1K 246 6.1%
Mimico 25.2K 138 8.7%
Long Branch 32.3K 176 11.3%
Port Credit 50.2K 274 9.8%
Clarkson 58.9K 321 6.3%
Oakville 62.9K 343 6.3%
Bronte 32.7K 179 5.7%
Appleby 32.8K 179 6.2%
Burlington 61.8K 338 10.7%
Aldershot 70.1K 383 14.4%
HAMILTON 22.8K 174 13.0%
WEST HARBOUR 255 2 2.6%
St. Catharines 1.3K 7 24.3%
NIAGARA FALLS 4.0K 22 30.7%
% = % of previous year
RAIL CORRIDORS
Lakeshore West
Niagara
Milton
Kitchener
Barrie
Richmond Hill
Stouffville
Lakeshore East
Union Pearson Express
Station boardings may be impacted by data issues during COVID and do not include customers who did not pay the fare.
Percentage figures reflect percentage of previous year boardings seen this fiscal year.
UP Express station-level boardings are not available due to device issues presently being resolved.

⚠ Service Update

Starting April 27, 2020, Route 19 Hurontario will be replaced by two new routes: 17 Hurontario and 2 Hurontario. Learn more at **miway.ca/hurontario.**

19 Hurontario

Local Route
Monday to Sunday

Northbound to Highway 407 & Hurontario Park & Ride
Southbound to Port Credit GO Station

Legend

Terminal	TTC Subway Station	Library
Transitway Station	GO Train Station	Community Centre
High School, University or College	Hospital	Shopping Centre

Effective: September 05, 2016

MiWAY MISSISSAUGA

APPENDIX D:

Traffic Data

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Turning Movement Count (1 . HURONTARIO ST & JOHN ST)

Start Time	N Approach HURONTARIO ST						E Approach JOHN ST						S Approach HURONTARIO ST						W Approach JOHN ST						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	10	52	8	0	1	70	20	0	0	0	3	20	4	83	2	0	3	89	0	1	9	0	6	10	189	
06:45:00	55	72	7	0	5	134	16	2	0	0	2	18	3	72	2	0	2	77	5	1	27	0	5	33	262	
07:00:00	25	69	11	1	4	106	11	1	2	0	2	14	0	82	1	0	6	83	2	0	18	0	3	20	223	
07:15:00	57	84	10	0	10	151	21	1	1	0	8	23	2	93	6	0	1	101	7	3	25	0	2	35	310	984
07:30:00	58	93	9	0	6	160	24	3	0	0	4	27	2	82	10	0	4	94	7	6	45	0	4	58	339	1134
07:45:00	95	110	17	0	9	222	32	4	0	0	4	36	2	94	1	0	4	97	14	4	41	0	5	59	414	1286
08:00:00	90	124	30	0	21	244	41	4	0	0	18	45	4	110	4	0	5	118	10	7	40	0	42	57	464	1527
08:15:00	77	140	18	0	13	235	43	6	3	0	12	52	6	136	4	0	6	146	13	5	39	0	35	57	490	1707
08:30:00	29	117	25	0	4	171	37	5	4	0	12	46	4	109	6	0	5	119	6	6	23	0	10	35	371	1739
08:45:00	48	119	26	0	12	193	35	4	1	0	10	40	2	93	1	0	5	96	7	2	24	0	11	33	362	1687
09:00:00	8	141	35	1	1	185	34	3	5	0	7	42	5	93	0	0	5	98	7	3	11	0	7	21	346	1569
09:15:00	7	107	29	0	4	143	33	3	2	0	4	38	6	94	1	1	2	102	0	1	6	0	8	7	290	1369
BREAK																										
15:30:00	10	124	17	0	5	151	26	3	3	0	16	32	5	132	1	0	4	138	5	3	5	0	6	13	334	
15:45:00	11	109	29	0	5	149	34	1	3	0	6	38	9	163	2	1	6	175	5	0	6	0	17	11	373	
16:00:00	14	107	13	0	6	134	41	4	3	0	23	48	2	139	6	0	14	147	2	5	30	0	27	37	366	
16:15:00	6	113	30	0	9	149	36	3	2	0	15	41	5	98	3	0	4	106	2	4	21	0	18	27	323	1396
16:30:00	16	136	37	1	4	190	32	2	2	0	8	36	3	153	2	0	6	158	3	1	6	0	14	10	394	1456
16:45:00	24	105	29	1	12	159	39	5	8	0	25	52	11	143	5	0	19	159	4	3	15	0	34	22	392	1475
17:00:00	26	166	23	0	4	215	38	6	7	0	16	51	4	142	7	0	8	153	4	11	48	0	10	63	482	1591
17:15:00	33	138	32	0	5	203	43	5	4	0	16	52	5	143	2	0	21	150	5	2	19	0	36	26	431	1699
17:30:00	32	121	31	0	14	184	41	6	3	0	18	50	4	133	4	0	32	141	9	7	60	0	22	76	451	1756
17:45:00	26	85	32	1	11	144	34	4	4	0	12	42	3	135	3	0	14	141	8	2	35	0	21	45	372	1736
18:00:00	16	113	31	1	9	161	33	2	3	0	9	38	2	165	3	0	4	170	3	3	39	0	22	45	414	1668
18:15:00	18	128	14	0	13	160	33	4	3	0	4	40	2	108	4	1	9	115	9	2	18	0	19	29	344	1581
Grand Total	791	2673	543	6	187	4013	777	81	63	0	254	921	95	2795	80	3	189	2973	137	82	610	0	384	829	**8736**	-
Approach%	19.7%	66.6%	13.5%	0.1%		-	84.4%	8.8%	6.8%	0%		-	3.2%	94%	2.7%	0.1%		-	16.5%	9.9%	73.6%	0%		-	-	-
Totals %	9.1%	30.6%	6.2%	0.1%		45.9%	8.9%	0.9%	0.7%	0%		10.5%	1.1%	32%	0.9%	0%		34%	1.6%	0.9%	7%	0%		9.5%	-	-
Heavy	33	152	9	0		-	22	0	2	0		-	3	170	2	1		-	4	1	13	0		-	-	-
Heavy %	4.2%	5.7%	1.7%	0%		-	2.8%	0%	3.2%	0%		-	3.2%	6.1%	2.5%	33.3%		-	2.9%	1.2%	2.1%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Peak Hour: 07:45 AM - 08:45 AM Weather: Fog (0.24 °C)

Start Time	N Approach HURONTARIO ST						E Approach JOHN ST						S Approach HURONTARIO ST						W Approach JOHN ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:45:00	95	110	17	0	9	222	32	4	0	0	4	36	2	94	1	0	4	97	14	4	41	0	5	59	414
08:00:00	90	124	30	0	21	244	41	4	0	0	18	45	4	110	4	0	5	118	10	7	40	0	42	57	464
08:15:00	77	140	18	0	13	235	43	6	3	0	12	52	6	136	4	0	6	146	13	5	39	0	35	57	490
08:30:00	29	117	25	0	4	171	37	5	4	0	12	46	4	109	6	0	5	119	6	6	23	0	10	35	371
Grand Total	291	491	90	0	47	872	153	19	7	0	46	179	16	449	15	0	20	480	43	22	143	0	92	208	**1739**
Approach%	33.4%	56.3%	10.3%	0%		-	85.5%	10.6%	3.9%	0%		-	3.3%	93.5%	3.1%	0%		-	20.7%	10.6%	68.8%	0%		-	-
Totals %	16.7%	28.2%	5.2%	0%		50.1%	8.8%	1.1%	0.4%	0%		10.3%	0.9%	25.8%	0.9%	0%		27.6%	2.5%	1.3%	8.2%	0%		12%	-
PHF	0.77	0.88	0.75	0		0.89	0.89	0.79	0.44	0		0.86	0.67	0.83	0.63	0		0.82	0.77	0.79	0.87	0		0.88	-
Heavy	8	39	4	0		51	7	0	0	0		7	0	46	2	0		48	1	0	2	0		3	-
Heavy %	2.7%	7.9%	4.4%	0%		5.8%	4.6%	0%	0%	0%		3.9%	0%	10.2%	13.3%	0%		10%	2.3%	0%	1.4%	0%		1.4%	-
Lights	283	452	86	0		821	146	19	7	0		172	16	403	13	0		432	42	22	141	0		205	-
Lights %	97.3%	92.1%	95.6%	0%		94.2%	95.4%	100%	100%	0%		96.1%	100%	89.8%	86.7%	0%		90%	97.7%	100%	98.6%	0%		98.6%	-
Single-Unit Trucks	0	17	0	0		17	1	0	0	0		1	0	17	1	0		18	1	0	1	0		2	-
Single-Unit Trucks %	0%	3.5%	0%	0%		1.9%	0.7%	0%	0%	0%		0.6%	0%	3.8%	6.7%	0%		3.8%	2.3%	0%	0.7%	0%		1%	-
Buses	8	20	4	0		32	6	0	0	0		6	0	24	1	0		25	0	0	1	0		1	-
Buses %	2.7%	4.1%	4.4%	0%		3.7%	3.9%	0%	0%	0%		3.4%	0%	5.3%	6.7%	0%		5.2%	0%	0%	0.7%	0%		0.5%	-
Articulated Trucks	0	2	0	0		2	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	-
Articulated Trucks %	0%	0.4%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		1%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	46	-	-	-	-	-	45	-	-	-	-	-	20	-	-	-	-	-	90	-	-
Pedestrians%	-	-	-	-	22.4%		-	-	-	-	22%		-	-	-	-	9.8%		-	-	-	-	43.9%		-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-
Bicycles on Crosswalk%	-	-	-	-	0.5%		-	-	-	-	0.5%		-	-	-	-	0%		-	-	-	-	1%		-

Spectrum

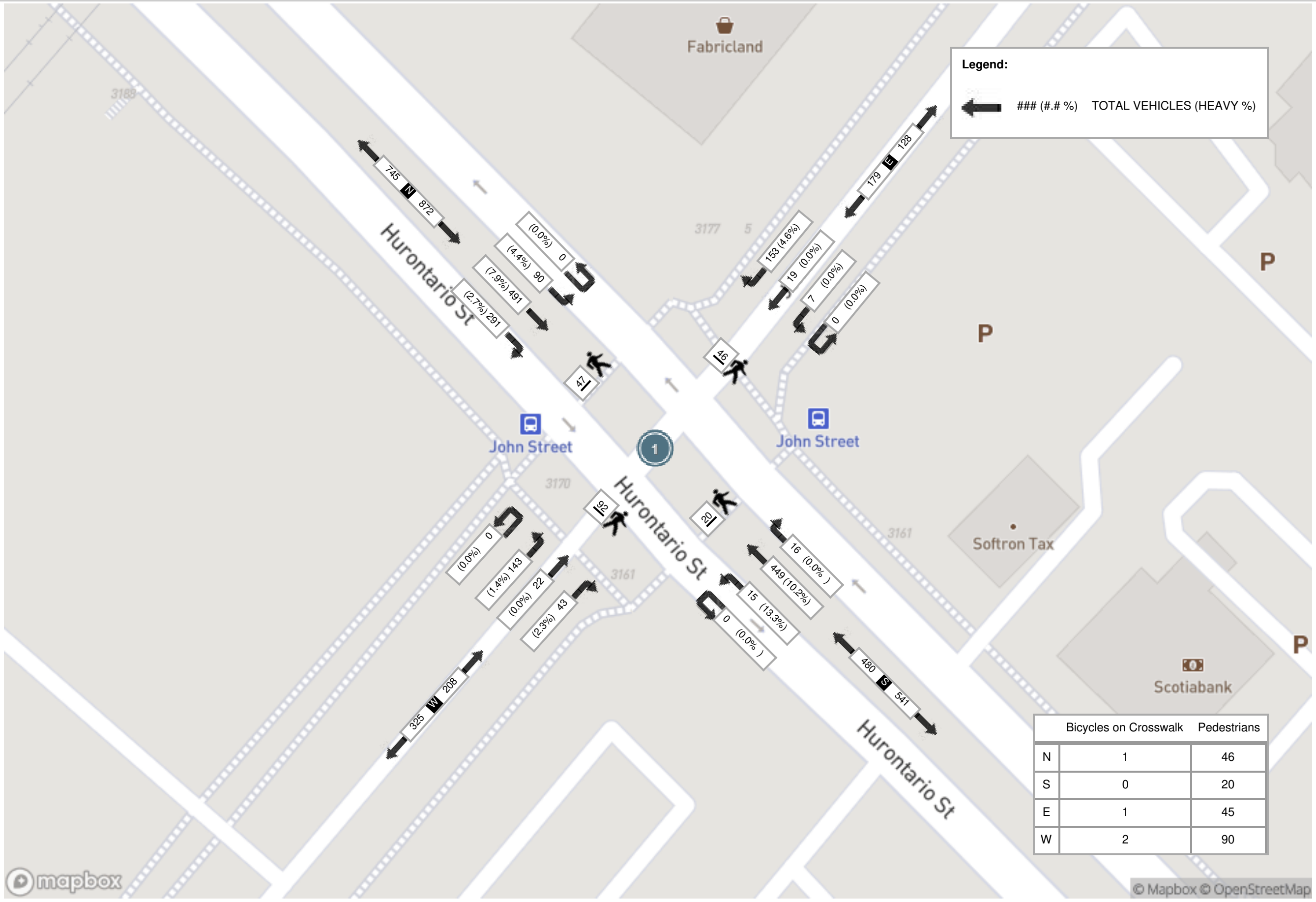
Turning Movement Count
Location Name: HURONTARIO ST & JOHN ST
Date: Thu, Feb 08, 2024 Deployment Lead: David Chu

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Peak Hour: 04:45 PM - 05:45 PM Weather: Broken Clouds (5.51 °C)

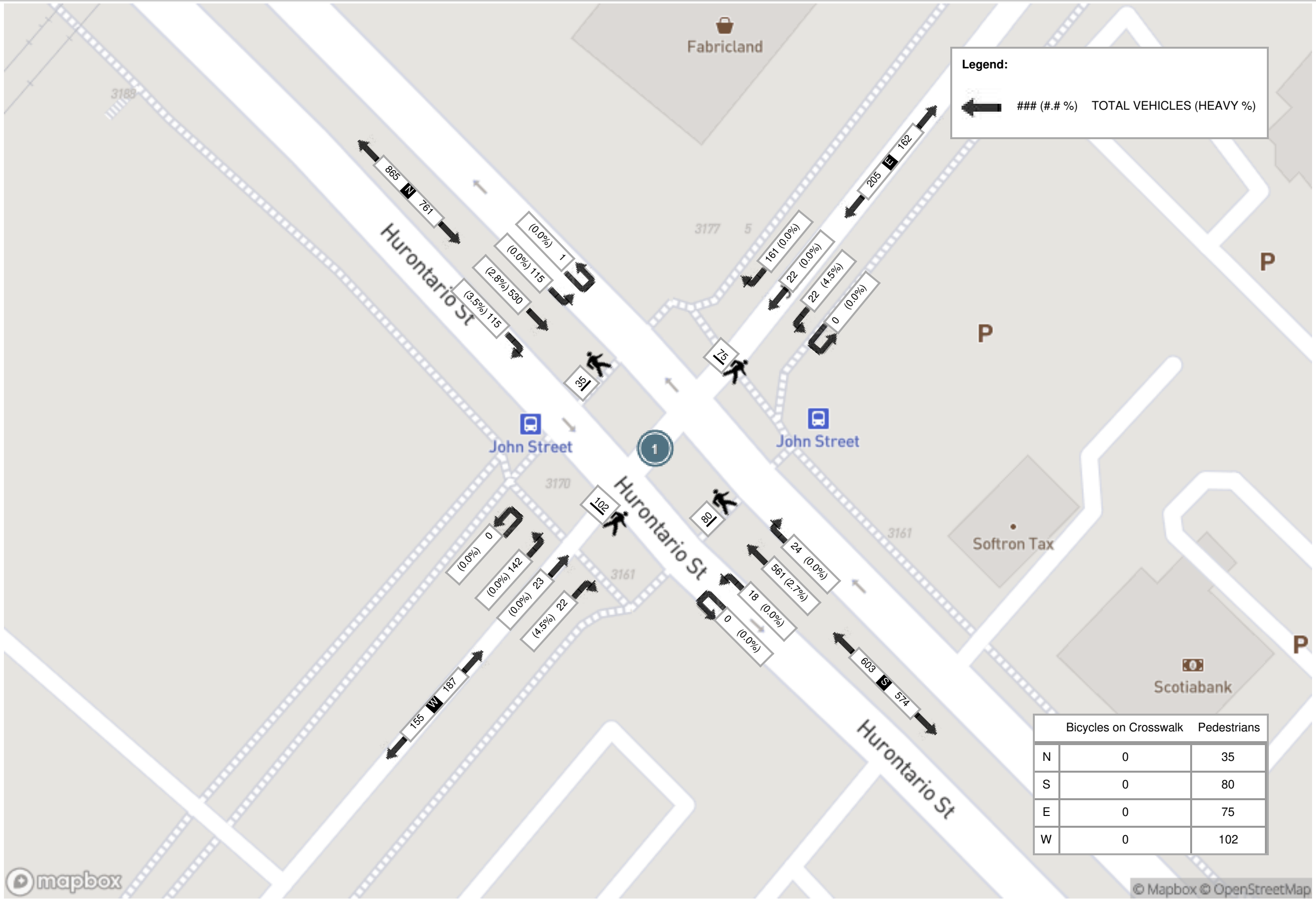
Start Time	N Approach HURONTARIO ST						E Approach JOHN ST						S Approach HURONTARIO ST						W Approach JOHN ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	24	105	29	1	12	159	39	5	8	0	25	52	11	143	5	0	19	159	4	3	15	0	34	22	392
17:00:00	26	166	23	0	4	215	38	6	7	0	16	51	4	142	7	0	8	153	4	11	48	0	10	63	482
17:15:00	33	138	32	0	5	203	43	5	4	0	16	52	5	143	2	0	21	150	5	2	19	0	36	26	431
17:30:00	32	121	31	0	14	184	41	6	3	0	18	50	4	133	4	0	32	141	9	7	60	0	22	76	451
Grand Total	115	530	115	1	35	761	161	22	22	0	75	205	24	561	18	0	80	603	22	23	142	0	102	187	**1756**
Approach%	15.1%	69.6%	15.1%	0.1%		-	78.5%	10.7%	10.7%	0%		-	4%	93%	3%	0%		-	11.8%	12.3%	75.9%	0%		-	-
Totals %	6.5%	30.2%	6.5%	0.1%		43.3%	9.2%	1.3%	1.3%	0%		11.7%	1.4%	31.9%	1%	0%		34.3%	1.3%	1.3%	8.1%	0%		10.6%	-
PHF	0.87	0.8	0.9	0.25		0.88	0.94	0.92	0.69	0		0.99	0.55	0.98	0.64	0		0.95	0.61	0.52	0.59	0		0.62	-
Heavy	4	15	0	0		19	0	0	1	0		1	0	15	0	0		15	1	0	0	0		1	-
Heavy %	3.5%	2.8%	0%	0%		2.5%	0%	0%	4.5%	0%		0.5%	0%	2.7%	0%	0%		2.5%	4.5%	0%	0%	0%		0.5%	-
Lights	111	514	115	1		741	161	22	21	0		204	24	546	18	0		588	21	23	142	0		186	-
Lights %	96.5%	97%	100%	100%		97.4%	100%	100%	95.5%	0%		99.5%	100%	97.3%	100%	0%		97.5%	95.5%	100%	100%	0%		99.5%	-
Single-Unit Trucks	1	5	0	0		6	0	0	1	0		1	0	5	0	0		5	0	0	0	0		0	-
Single-Unit Trucks %	0.9%	0.9%	0%	0%		0.8%	0%	0%	4.5%	0%		0.5%	0%	0.9%	0%	0%		0.8%	0%	0%	0%	0%		0%	-
Buses	3	8	0	0		11	0	0	0	0		0	0	10	0	0		10	1	0	0	0		1	-
Buses %	2.6%	1.5%	0%	0%		1.4%	0%	0%	0%	0%		0%	0%	1.8%	0%	0%		1.7%	4.5%	0%	0%	0%		0.5%	-
Articulated Trucks	0	2	0	0		2	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0.2%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	35	-	-	-	-	-	75	-	-	-	-	-	80	-	-	-	-	-	102	-	-
Pedestrians%	-	-	-	-	12%		-	-	-	-	25.7%		-	-	-	-	27.4%		-	-	-	-	34.9%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Peak Hour: 07:45 AM - 08:45 AM Weather: Fog (0.24 °C)



	Bicycles on Crosswalk	Pedestrians
N	1	46
S	0	20
E	1	45
W	2	90

Peak Hour: 04:45 PM - 05:45 PM Weather: Broken Clouds (5.51 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	35
S	0	80
E	0	75
W	0	102

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Turning Movement Count (2 . HURONTARIO ST & KIRWIN AVE / HILLCREST AVE)

Start Time	N Approach HURONTARIO ST						E Approach KIRWIN AVE						S Approach HURONTARIO ST						W Approach HILLCREST AVE						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	3	48	5	0	2	56	4	8	1	0	2	13	0	78	2	0	1	80	7	10	7	0	0	24	173	
06:45:00	5	63	4	1	0	73	8	9	1	0	0	18	1	64	4	0	1	69	11	13	5	0	1	29	189	
07:00:00	0	70	1	0	0	71	9	10	1	0	2	20	2	71	5	0	5	78	11	14	7	0	1	32	201	
07:15:00	4	84	5	0	4	93	9	18	1	0	4	28	1	75	8	0	2	84	10	15	9	0	2	34	239	802
07:30:00	5	89	1	0	2	95	4	15	6	0	2	25	3	91	7	0	2	101	14	22	6	0	3	42	263	892
07:45:00	4	118	2	0	3	124	7	14	4	0	3	25	2	77	5	0	5	84	11	27	8	0	8	46	279	982
08:00:00	6	128	1	1	9	136	7	29	4	0	12	40	3	103	14	0	15	120	11	13	5	0	44	29	325	1106
08:15:00	2	150	2	0	9	154	9	19	7	0	8	35	2	126	7	0	11	135	32	28	10	0	53	70	394	1261
08:30:00	6	115	6	0	3	127	7	25	5	0	13	37	1	99	11	0	8	111	18	25	11	0	13	54	329	1327
08:45:00	5	109	4	2	4	120	13	23	3	0	6	39	7	76	10	0	2	93	19	34	6	0	12	59	311	1359
09:00:00	5	142	12	1	1	160	5	17	6	0	7	28	5	76	10	0	3	91	21	28	13	0	5	62	341	1375
09:15:00	1	99	7	0	0	107	15	25	1	0	6	41	6	68	7	0	2	81	16	32	19	0	4	67	296	1277
BREAK																										
15:30:00	6	135	7	0	5	148	12	36	6	0	18	54	7	132	18	0	11	157	21	28	9	0	6	58	417	
15:45:00	1	101	7	1	6	110	22	55	8	0	15	85	3	126	25	0	13	154	21	55	6	0	12	82	431	
16:00:00	3	97	8	0	8	108	9	34	3	0	23	46	4	130	28	0	18	162	14	27	8	0	16	49	365	
16:15:00	10	104	10	0	13	124	15	67	14	0	18	96	9	87	22	0	5	118	22	47	11	0	18	80	418	1631
16:30:00	6	107	9	0	6	122	13	60	6	0	13	79	8	125	22	1	11	156	14	39	9	0	6	62	419	1633
16:45:00	5	109	7	0	6	121	20	44	9	0	27	73	6	137	25	0	20	168	21	20	12	0	32	53	415	1617
17:00:00	9	147	17	0	3	173	13	73	7	1	20	94	15	120	31	0	15	166	23	32	19	0	2	74	507	1759
17:15:00	7	114	10	0	4	131	13	53	7	0	16	73	6	118	20	0	18	144	20	31	10	0	23	61	409	1750
17:30:00	3	129	10	0	4	142	13	45	10	0	21	68	10	117	22	0	3	149	26	23	19	0	18	68	427	1758
17:45:00	5	81	9	0	11	95	10	42	7	0	17	59	5	119	16	0	13	140	18	40	13	0	16	71	365	1708
18:00:00	8	100	10	0	10	118	20	44	5	0	15	69	12	129	19	0	5	160	34	44	12	1	10	91	438	1639
18:15:00	12	117	9	0	4	138	16	40	4	0	15	60	5	99	16	1	4	121	11	32	11	0	10	54	373	1603
Grand Total	121	2556	163	6	117	2846	273	805	126	1	283	1205	123	2443	354	2	193	2922	426	679	245	1	315	1351	**8324**	-
Approach%	4.3%	89.8%	5.7%	0.2%		-	22.7%	66.8%	10.5%	0.1%		-	4.2%	83.6%	12.1%	0.1%		-	31.5%	50.3%	18.1%	0.1%		-	-	-
Totals %	1.5%	30.7%	2%	0.1%		34.2%	3.3%	9.7%	1.5%	0%		14.5%	1.5%	29.3%	4.3%	0%		35.1%	5.1%	8.2%	2.9%	0%		16.2%	-	-
Heavy	12	146	3	0		-	6	13	5	0		-	4	143	27	0		-	24	8	26	0		-	-	-
Heavy %	9.9%	5.7%	1.8%	0%		-	2.2%	1.6%	4%	0%		-	3.3%	5.9%	7.6%	0%		-	5.6%	1.2%	10.6%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Peak Hour: 08:15 AM - 09:15 AM Weather: Fog (0.24 °C)

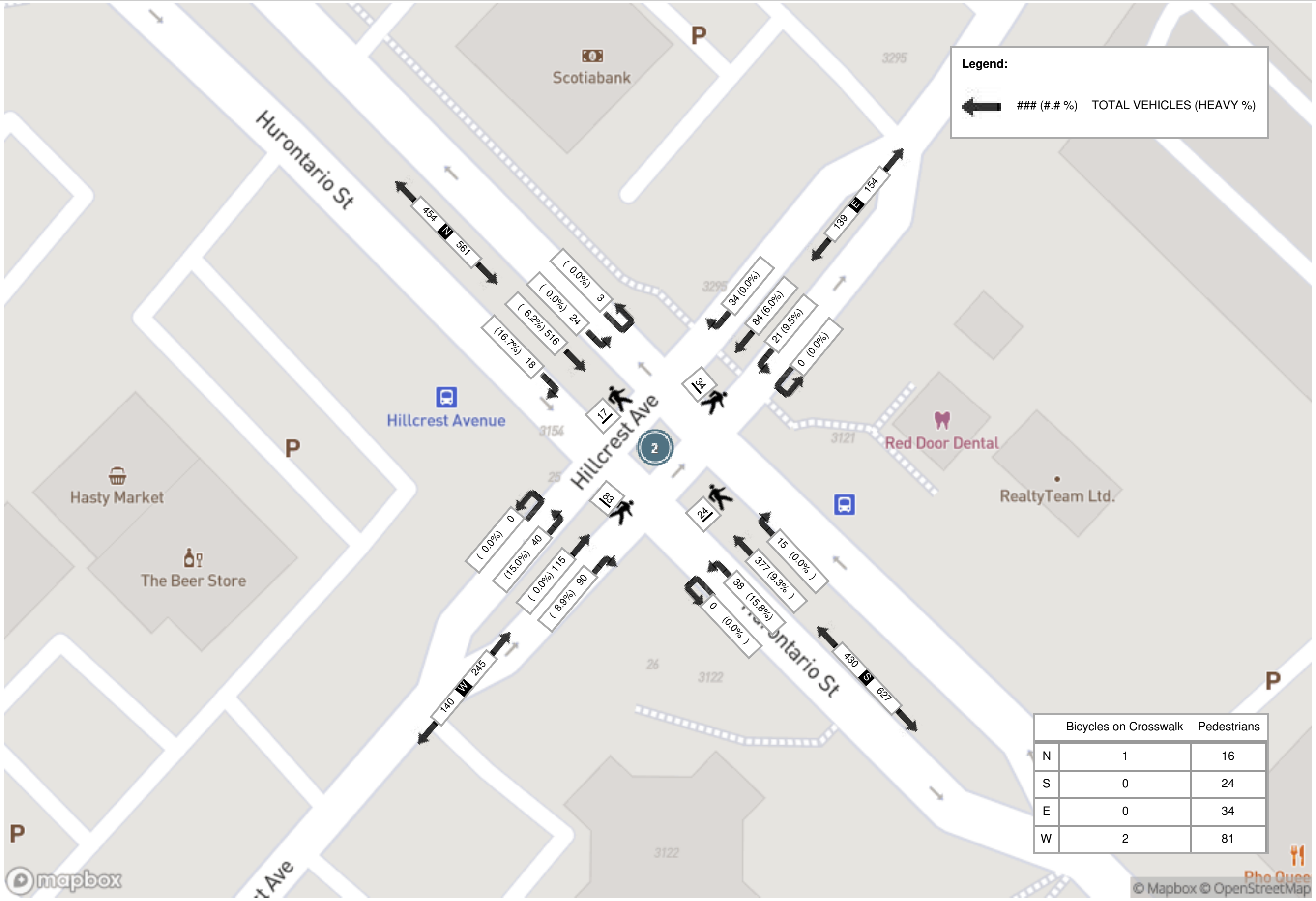
Start Time	N Approach HURONTARIO ST						E Approach KIRWIN AVE						S Approach HURONTARIO ST						W Approach HILLCREST AVE						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	2	150	2	0	9	154	9	19	7	0	8	35	2	126	7	0	11	135	32	28	10	0	53	70	394
08:30:00	6	115	6	0	3	127	7	25	5	0	13	37	1	99	11	0	8	111	18	25	11	0	13	54	329
08:45:00	5	109	4	2	4	120	13	23	3	0	6	39	7	76	10	0	2	93	19	34	6	0	12	59	311
09:00:00	5	142	12	1	1	160	5	17	6	0	7	28	5	76	10	0	3	91	21	28	13	0	5	62	341
Grand Total	18	516	24	3	17	561	34	84	21	0	34	139	15	377	38	0	24	430	90	115	40	0	83	245	**1375**
Approach%	3.2%	92%	4.3%	0.5%		-	24.5%	60.4%	15.1%	0%		-	3.5%	87.7%	8.8%	0%		-	36.7%	46.9%	16.3%	0%		-	-
Totals %	1.3%	37.5%	1.7%	0.2%		40.8%	2.5%	6.1%	1.5%	0%		10.1%	1.1%	27.4%	2.8%	0%		31.3%	6.5%	8.4%	2.9%	0%		17.8%	-
PHF	0.75	0.86	0.5	0.38		0.88	0.65	0.84	0.75	0		0.89	0.54	0.75	0.86	0		0.8	0.7	0.85	0.77	0		0.88	-
Heavy	3	32	0	0		35	0	5	2	0		7	0	35	6	0		41	8	0	6	0		14	-
Heavy %	16.7%	6.2%	0%	0%		6.2%	0%	6%	9.5%	0%		5%	0%	9.3%	15.8%	0%		9.5%	8.9%	0%	15%	0%		5.7%	-
Lights	15	484	24	3		526	34	79	19	0		132	15	342	32	0		389	82	115	34	0		231	-
Lights %	83.3%	93.8%	100%	100%		93.8%	100%	94%	90.5%	0%		95%	100%	90.7%	84.2%	0%		90.5%	91.1%	100%	85%	0%		94.3%	-
Single-Unit Trucks	1	18	0	0		19	0	0	0	0		0	0	11	1	0		12	0	0	2	0		2	-
Single-Unit Trucks %	5.6%	3.5%	0%	0%		3.4%	0%	0%	0%	0%		0%	0%	2.9%	2.6%	0%		2.8%	0%	0%	5%	0%		0.8%	-
Buses	1	12	0	0		13	0	5	2	0		7	0	21	5	0		26	8	0	4	0		12	-
Buses %	5.6%	2.3%	0%	0%		2.3%	0%	6%	9.5%	0%		5%	0%	5.6%	13.2%	0%		6%	8.9%	0%	10%	0%		4.9%	-
Articulated Trucks	1	2	0	0		3	0	0	0	0		0	0	3	0	0		3	0	0	0	0		0	-
Articulated Trucks %	5.6%	0.4%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.7%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	16	-	-	-	-	-	34	-	-	-	-	-	24	-	-	-	-	-	81	-	-
Pedestrians%	-	-	-	-	10.1%		-	-	-	-	21.5%		-	-	-	-	15.2%		-	-	-	-	51.3%		-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-
Bicycles on Crosswalk%	-	-	-	-	0.6%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	1.3%		-

Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (5.51 °C)

Start Time	N Approach HURONTARIO ST						E Approach KIRWIN AVE						S Approach HURONTARIO ST						W Approach HILLCREST AVE						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	10	104	10	0	13	124	15	67	14	0	18	96	9	87	22	0	5	118	22	47	11	0	18	80	418
16:30:00	6	107	9	0	6	122	13	60	6	0	13	79	8	125	22	1	11	156	14	39	9	0	6	62	419
16:45:00	5	109	7	0	6	121	20	44	9	0	27	73	6	137	25	0	20	168	21	20	12	0	32	53	415
17:00:00	9	147	17	0	3	173	13	73	7	1	20	94	15	120	31	0	15	166	23	32	19	0	2	74	507
Grand Total	30	467	43	0	28	540	61	244	36	1	78	342	38	469	100	1	51	608	80	138	51	0	58	269	**1759**
Approach%	5.6%	86.5%	8%	0%		-	17.8%	71.3%	10.5%	0.3%		-	6.3%	77.1%	16.4%	0.2%		-	29.7%	51.3%	19%	0%		-	-
Totals %	1.7%	26.5%	2.4%	0%		30.7%	3.5%	13.9%	2%	0.1%		19.4%	2.2%	26.7%	5.7%	0.1%		34.6%	4.5%	7.8%	2.9%	0%		15.3%	-
PHF	0.75	0.79	0.63	0		0.78	0.76	0.84	0.64	0.25		0.89	0.63	0.86	0.81	0.25		0.9	0.87	0.73	0.67	0		0.84	-
Heavy	0	15	0	0		15	2	0	1	0		3	1	14	1	0		16	2	1	3	0		6	-
Heavy %	0%	3.2%	0%	0%		2.8%	3.3%	0%	2.8%	0%		0.9%	2.6%	3%	1%	0%		2.6%	2.5%	0.7%	5.9%	0%		2.2%	-
Lights	30	451	43	0		524	59	244	35	1		339	37	455	99	1		592	78	137	48	0		263	-
Lights %	100%	96.6%	100%	0%		97%	96.7%	100%	97.2%	100%		99.1%	97.4%	97%	99%	100%		97.4%	97.5%	99.3%	94.1%	0%		97.8%	-
Single-Unit Trucks	0	6	0	0		6	2	0	1	0		3	1	5	0	0		6	1	0	0	0		1	-
Single-Unit Trucks %	0%	1.3%	0%	0%		1.1%	3.3%	0%	2.8%	0%		0.9%	2.6%	1.1%	0%	0%		1%	1.3%	0%	0%	0%		0.4%	-
Buses	0	9	0	0		9	0	0	0	0		0	0	9	1	0		10	1	1	3	0		5	-
Buses %	0%	1.9%	0%	0%		1.7%	0%	0%	0%	0%		0%	0%	1.9%	1%	0%		1.6%	1.3%	0.7%	5.9%	0%		1.9%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	28	-	-	-	-	-	78	-	-	-	-	-	51	-	-	-	-	-	58	-	-
Pedestrians%	-	-	-	-	13%		-	-	-	-	36.3%		-	-	-	-	23.7%		-	-	-	-	27%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Peak Hour: 08:15 AM - 09:15 AM Weather: Fog (0.24 °C)



	Bicycles on Crosswalk	Pedestrians
N	1	16
S	0	24
E	0	34
W	2	81

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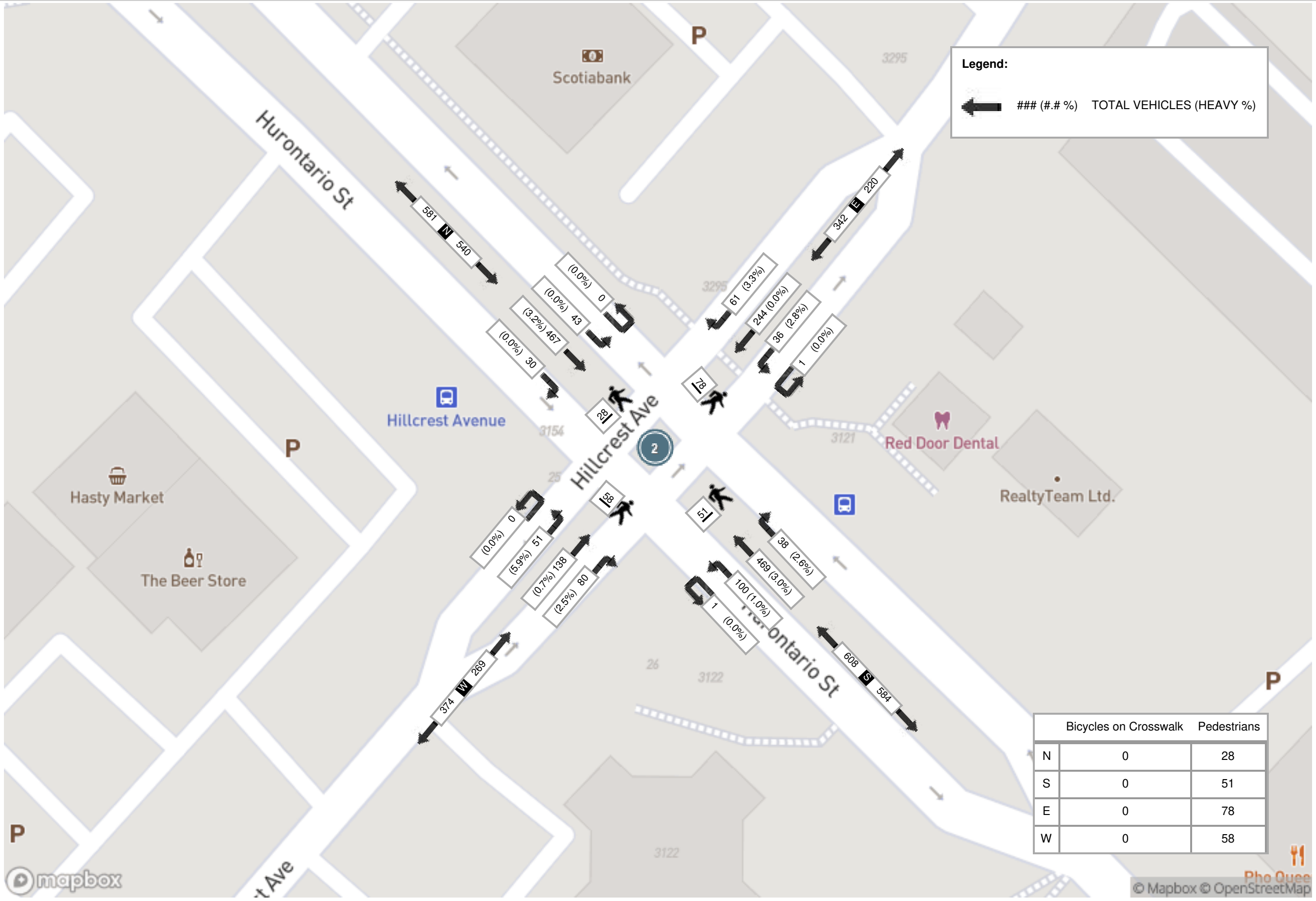
Spectrum

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (5.51 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	28
S	0	51
E	0	78
W	0	58

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (3 . JOHN ST & JAGUAR VALLEY DR)

Start Time	E Approach JOHN ST					S Approach JAGUAR VALLEY DR					W Approach JOHN ST					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
06:30:00	13	2	0	0	15	0	6	0	0	6	3	4	1	1	8	29	
06:45:00	14	1	0	0	15	0	8	0	3	8	2	5	0	0	7	30	
07:00:00	12	0	0	0	12	1	7	0	2	8	7	10	0	0	17	37	
07:15:00	16	1	0	0	17	1	4	0	0	5	11	8	0	1	19	41	137
07:30:00	23	1	0	1	24	1	13	0	4	14	7	12	0	6	19	57	165
07:45:00	20	0	0	0	20	0	6	0	4	6	6	10	0	2	16	42	177
08:00:00	36	2	0	0	38	4	5	0	7	9	7	15	1	1	23	70	210
08:15:00	33	1	0	0	34	0	11	0	3	11	9	22	0	1	31	76	245
08:30:00	42	1	0	1	43	0	10	0	0	10	6	22	0	1	28	81	269
08:45:00	23	0	0	1	23	0	11	0	5	11	15	15	0	2	30	64	291
09:00:00	34	1	0	0	35	3	8	0	5	11	16	32	0	0	48	94	315
09:15:00	22	1	0	0	23	0	4	2	1	6	17	16	0	2	33	62	301
BREAK																	
15:30:00	33	0	0	0	33	3	9	0	12	12	10	24	0	3	34	79	
15:45:00	47	1	0	1	48	3	7	0	12	10	14	13	0	1	27	85	
16:00:00	35	1	0	1	36	1	18	0	11	19	8	23	0	1	31	86	
16:15:00	28	1	0	0	29	1	16	0	6	17	9	12	0	2	21	67	317
16:30:00	34	0	0	0	34	2	12	0	10	14	13	14	0	6	27	75	313
16:45:00	28	0	0	2	28	5	16	0	11	21	14	17	0	7	31	80	308
17:00:00	40	0	0	2	40	3	14	0	7	17	10	25	0	5	35	92	314
17:15:00	36	4	0	2	40	4	9	0	2	13	11	21	0	2	32	85	332
17:30:00	44	2	0	0	46	2	14	1	10	17	13	23	0	7	36	99	356
17:45:00	29	0	0	2	29	1	17	0	11	18	13	15	0	3	28	75	351
18:00:00	23	0	0	2	23	1	11	0	9	12	20	18	0	2	38	73	332
18:15:00	26	1	0	1	27	4	6	0	3	10	10	20	0	1	30	67	314
Grand Total	691	21	0	16	712	40	242	3	138	285	251	396	2	57	649	**1646**	-
Approach%	97.1%	2.9%	0%		-	14%	84.9%	1.1%		-	38.7%	61%	0.3%		-	**-**	-
Totals %	42%	1.3%	0%		43.3%	2.4%	14.7%	0.2%		17.3%	15.2%	24.1%	0.1%		39.4%	**-**	-
Heavy	11	2	0		-	8	23	0		-	12	5	1		-	**-**	-
Heavy %	1.6%	9.5%	0%		-	20%	9.5%	0%		-	4.8%	1.3%	50%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: JOHN ST & JAGUAR VALLEY DR
Date: Tue, Jan 31, 2023 Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (-13.36 °C)

Start Time	E Approach JOHN ST					S Approach JAGUAR VALLEY DR					W Approach JOHN ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:15:00	33	1	0	0	34	0	11	0	3	11	9	22	0	1	31	76
08:30:00	42	1	0	1	43	0	10	0	0	10	6	22	0	1	28	81
08:45:00	23	0	0	1	23	0	11	0	5	11	15	15	0	2	30	64
09:00:00	34	1	0	0	35	3	8	0	5	11	16	32	0	0	48	94
Grand Total	132	3	0	2	135	3	40	0	13	43	46	91	0	4	137	**315**
Approach%	97.8%	2.2%	0%		-	7%	93%	0%		-	33.6%	66.4%	0%		-	-
Totals %	41.9%	1%	0%		42.9%	1%	12.7%	0%		13.7%	14.6%	28.9%	0%		43.5%	-
PHF	0.79	0.75	0		0.78	0.25	0.91	0		0.98	0.72	0.71	0		0.71	-
Heavy	1	1	0		2	1	5	0		6	5	0	0		5	-
Heavy %	0.8%	33.3%	0%		1.5%	33.3%	12.5%	0%		14%	10.9%	0%	0%		3.6%	-
Lights	131	2	0		133	2	35	0		37	41	91	0		132	-
Lights %	99.2%	66.7%	0%		98.5%	66.7%	87.5%	0%		86%	89.1%	100%	0%		96.4%	-
Single-Unit Trucks	1	0	0		1	0	5	0		5	4	0	0		4	-
Single-Unit Trucks %	0.8%	0%	0%		0.7%	0%	12.5%	0%		11.6%	8.7%	0%	0%		2.9%	-
Buses	0	1	0		1	1	0	0		1	1	0	0		1	-
Buses %	0%	33.3%	0%		0.7%	33.3%	0%	0%		2.3%	2.2%	0%	0%		0.7%	-
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	2	-	-	-	-	13	-	-	-	-	4	-	-
Pedestrians%	-	-	-	10.5%		-	-	-	68.4%		-	-	-	21.1%		-

Spectrum

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

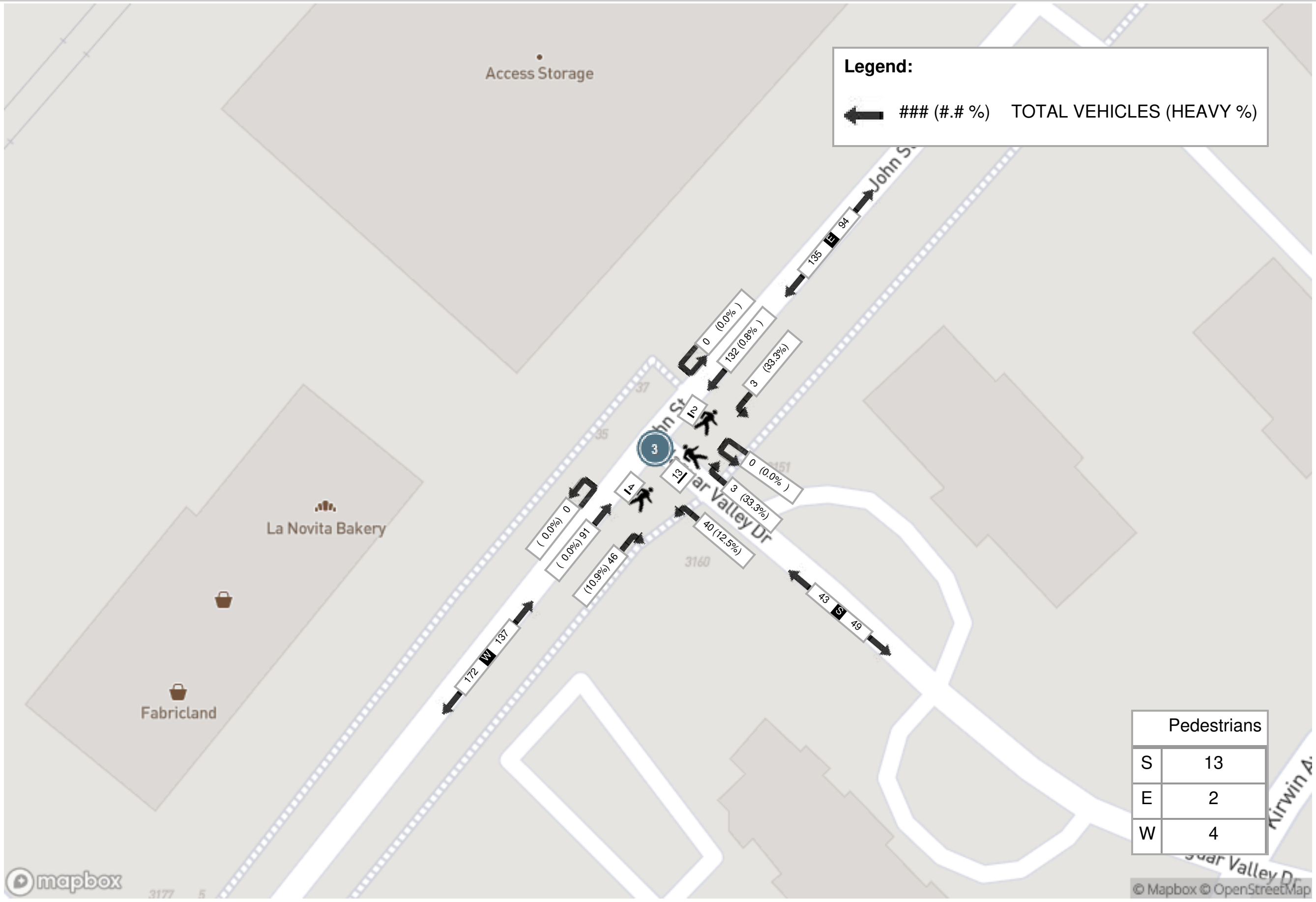
Peak Hour: 04:45 PM - 05:45 PM Weather: Broken Clouds (-5.38 °C)

Start Time	E Approach JOHN ST					S Approach JAGUAR VALLEY DR					W Approach JOHN ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:45:00	28	0	0	2	28	5	16	0	11	21	14	17	0	7	31	80
17:00:00	40	0	0	2	40	3	14	0	7	17	10	25	0	5	35	92
17:15:00	36	4	0	2	40	4	9	0	2	13	11	21	0	2	32	85
17:30:00	44	2	0	0	46	2	14	1	10	17	13	23	0	7	36	99
Grand Total	148	6	0	6	154	14	53	1	30	68	48	86	0	21	134	**356**
Approach%	96.1%	3.9%	0%		-	20.6%	77.9%	1.5%		-	35.8%	64.2%	0%		-	-
Totals %	41.6%	1.7%	0%		43.3%	3.9%	14.9%	0.3%		19.1%	13.5%	24.2%	0%		37.6%	-
PHF	0.84	0.38	0		0.84	0.7	0.83	0.25		0.81	0.86	0.86	0		0.93	-
Heavy	0	0	0		0	0	4	0		4	0	0	0		0	-
Heavy %	0%	0%	0%		0%	0%	7.5%	0%		5.9%	0%	0%	0%		0%	-
Lights	148	6	0		154	14	49	1		64	48	86	0		134	-
Lights %	100%	100%	0%		100%	100%	92.5%	100%		94.1%	100%	100%	0%		100%	-
Single-Unit Trucks	0	0	0		0	0	4	0		4	0	0	0		0	-
Single-Unit Trucks %	0%	0%	0%		0%	0%	7.5%	0%		5.9%	0%	0%	0%		0%	-
Buses	0	0	0		0	0	0	0		0	0	0	0		0	-
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	6	-	-	-	-	30	-	-	-	-	21	-	-
Pedestrians%	-	-	-	10.5%		-	-	-	52.6%		-	-	-	36.8%		-

Turning Movement Count
Location Name: JOHN ST & JAGUAR VALLEY DR
Date: Tue, Jan 31, 2023 Deployment Lead: Peter Ilias

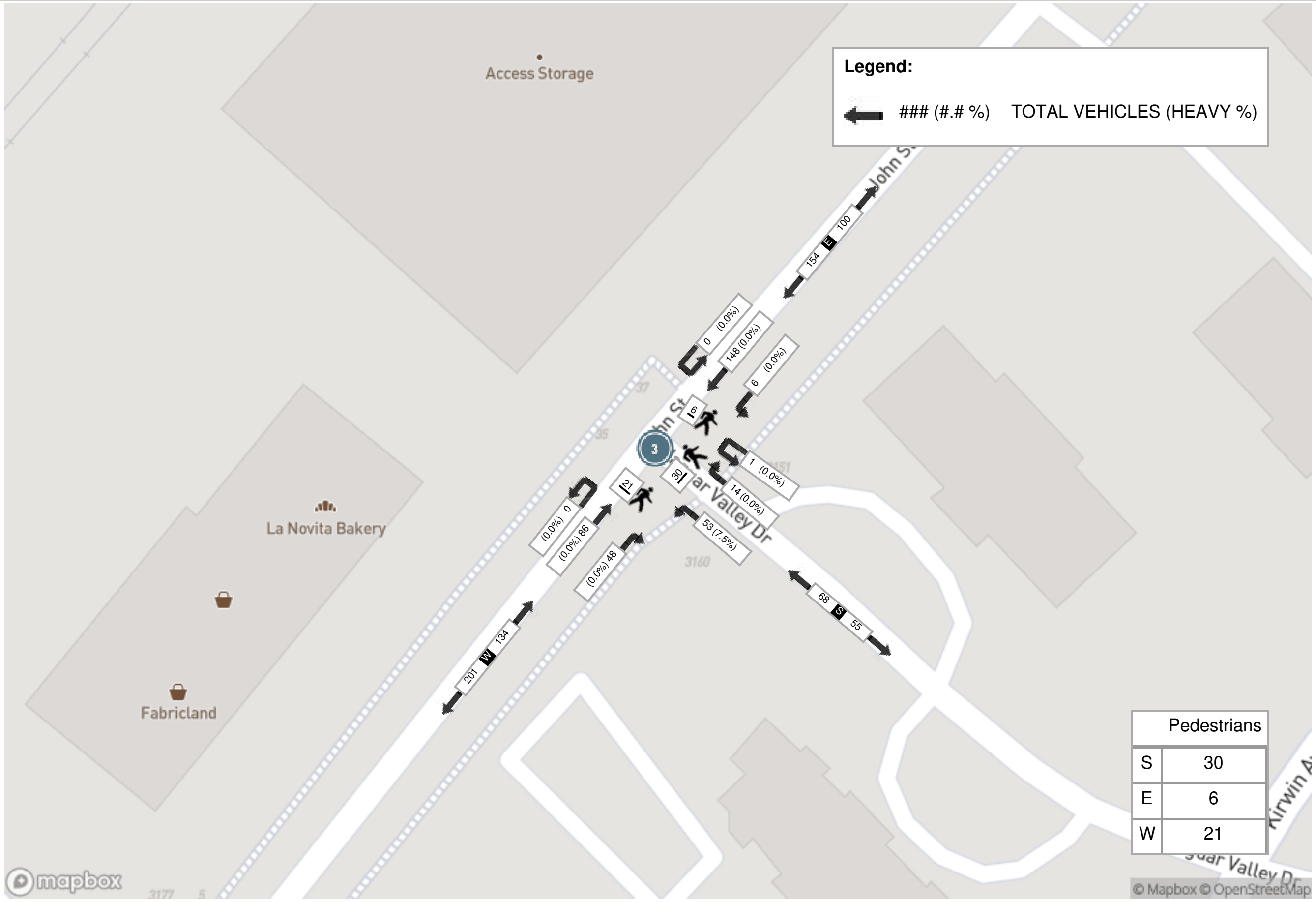
Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (-13.36 °C)



Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Broken Clouds (-5.38 °C)



	Pedestrians
S	30
E	6
W	21

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Spectrum

Turning Movement Count
Location Name: KIRWIN AVE & JAGUAR VALLEY DR
Date: Tue, Jan 31, 2023   Deployment Lead: Peter Ilias

Turning Movement Count (5 . KIRWIN AVE & JAGUAR VALLEY DR)

Start Time	N Approach JAGUAR VALLEY DR						E Approach KIRWIN AVE						S Approach JAGUAR VALLEY DR						W Approach KIRWIN AVE						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	1	4	1	0	0	6	3	6	1	0	1	10	0	4	1	0	1	5	1	11	0	0	2	12	33	
06:45:00	3	0	0	0	2	3	2	5	3	0	1	10	0	5	2	0	1	7	2	14	0	0	1	16	36	
07:00:00	3	4	1	0	3	8	2	14	0	0	0	16	4	3	5	0	5	12	5	12	1	0	3	18	54	
07:15:00	3	6	3	0	0	12	1	17	1	0	0	19	0	5	8	0	4	13	2	19	0	0	2	21	65	188
07:30:00	4	4	2	0	3	10	4	28	1	0	2	33	3	10	8	0	2	21	4	19	0	0	8	23	87	242
07:45:00	1	3	3	0	3	7	1	19	5	0	3	25	2	7	10	0	1	19	3	19	0	0	1	22	73	279
08:00:00	5	2	3	0	2	10	3	29	4	0	9	36	3	5	9	0	4	17	6	31	4	0	3	41	104	329
08:15:00	3	4	4	0	6	11	4	29	2	0	1	35	5	4	5	0	3	14	4	37	1	0	2	42	102	366
08:30:00	4	2	2	0	0	8	3	30	1	0	0	34	0	4	5	0	3	9	2	27	4	0	1	33	84	363
08:45:00	3	5	6	0	1	14	2	26	2	0	0	30	4	2	3	0	3	9	4	53	6	0	2	63	116	406
09:00:00	2	9	6	0	2	17	3	31	2	0	0	36	3	7	1	0	1	11	7	42	1	0	3	50	114	416
09:15:00	6	7	7	0	2	20	2	39	2	0	2	43	3	2	5	0	16	10	5	25	2	0	0	32	105	419
BREAK																										
15:30:00	3	4	4	0	0	11	0	41	5	0	4	46	2	7	9	0	3	18	3	39	5	0	3	47	122	
15:45:00	1	9	6	0	3	16	4	48	3	0	0	55	3	5	3	0	3	11	11	35	4	0	2	50	132	
16:00:00	1	3	6	0	1	10	4	80	1	0	0	85	12	10	9	0	2	31	6	38	5	0	4	49	175	
16:15:00	8	4	1	0	3	13	1	71	8	0	1	80	5	7	6	0	4	18	12	40	11	0	1	63	174	603
16:30:00	4	7	2	0	0	13	3	64	2	0	4	69	6	6	14	0	3	26	10	37	6	0	5	53	161	642
16:45:00	2	8	3	0	4	13	5	51	3	0	4	59	3	9	12	0	4	24	15	27	6	0	3	48	144	654
17:00:00	2	4	5	0	4	11	5	60	1	0	8	66	5	5	11	0	8	21	8	44	7	0	4	59	157	636
17:15:00	1	4	5	0	5	10	4	59	5	0	1	68	2	7	14	0	4	23	9	38	3	0	6	50	151	613
17:30:00	6	8	5	0	2	19	0	69	5	0	2	74	3	10	17	0	8	30	6	30	7	0	5	43	166	618
17:45:00	3	8	3	0	1	14	5	58	5	0	1	68	6	10	25	0	3	41	13	32	7	0	3	52	175	649
18:00:00	3	11	6	0	1	20	1	41	3	0	5	45	3	4	8	0	8	15	7	34	9	0	3	50	130	622
18:15:00	3	4	4	0	2	11	3	45	3	0	1	51	4	3	9	0	3	16	7	31	3	0	2	41	119	590
Grand Total	75	124	88	0	50	287	65	960	68	0	50	1093	81	141	199	0	97	421	152	734	92	0	69	978	**2779**	-
Approach%	26.1%	43.2%	30.7%	0%		-	5.9%	87.8%	6.2%	0%		-	19.2%	33.5%	47.3%	0%		-	15.5%	75.1%	9.4%	0%		-	-	-
Totals %	2.7%	4.5%	3.2%	0%		10.3%	2.3%	34.5%	2.4%	0%		39.3%	2.9%	5.1%	7.2%	0%		15.1%	5.5%	26.4%	3.3%	0%		35.2%	-	-
Heavy	7	3	4	0		-	5	17	6	0		-	3	4	1	0		-	2	11	23	0		-	-	-
Heavy %	9.3%	2.4%	4.5%	0%		-	7.7%	1.8%	8.8%	0%		-	3.7%	2.8%	0.5%	0%		-	1.3%	1.5%	25%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Turning Movement Count
Location Name: KIRWIN AVE & JAGUAR VALLEY DR
Date: Tue, Jan 31, 2023   Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:30 AM - 09:30 AM   Weather: Broken Clouds (-13.36 °C)

Start Time	N Approach JAGUAR VALLEY DR						E Approach KIRWIN AVE						S Approach JAGUAR VALLEY DR						W Approach KIRWIN AVE						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:30:00	4	2	2	0	0	8	3	30	1	0	0	34	0	4	5	0	3	9	2	27	4	0	1	33	84
08:45:00	3	5	6	0	1	14	2	26	2	0	0	30	4	2	3	0	3	9	4	53	6	0	2	63	116
09:00:00	2	9	6	0	2	17	3	31	2	0	0	36	3	7	1	0	1	11	7	42	1	0	3	50	114
09:15:00	6	7	7	0	2	20	2	39	2	0	2	43	3	2	5	0	16	10	5	25	2	0	0	32	105
Grand Total	15	23	21	0	5	59	10	126	7	0	2	143	10	15	14	0	23	39	18	147	13	0	6	178	**419**
Approach%	25.4%	39%	35.6%	0%		-	7%	88.1%	4.9%	0%		-	25.6%	38.5%	35.9%	0%		-	10.1%	82.6%	7.3%	0%		-	-
Totals %	3.6%	5.5%	5%	0%		14.1%	2.4%	30.1%	1.7%	0%		34.1%	2.4%	3.6%	3.3%	0%		9.3%	4.3%	35.1%	3.1%	0%		42.5%	-
PHF	0.63	0.64	0.75	0		0.74	0.83	0.81	0.88	0		0.83	0.63	0.54	0.7	0		0.89	0.64	0.69	0.54	0		0.71	-
Heavy	3	1	0	0		4	1	8	0	0		9	1	1	0	0		2	1	1	5	0		7	-
Heavy %	20%	4.3%	0%	0%		6.8%	10%	6.3%	0%	0%		6.3%	10%	6.7%	0%	0%		5.1%	5.6%	0.7%	38.5%	0%		3.9%	-
Lights	12	22	21	0		55	9	118	7	0		134	9	14	14	0		37	17	146	8	0		171	-
Lights %	80%	95.7%	100%	0%		93.2%	90%	93.7%	100%	0%		93.7%	90%	93.3%	100%	0%		94.9%	94.4%	99.3%	61.5%	0%		96.1%	-
Single-Unit Trucks	3	1	0	0		4	0	2	0	0		2	0	1	0	0		1	1	0	4	0		5	-
Single-Unit Trucks %	20%	4.3%	0%	0%		6.8%	0%	1.6%	0%	0%		1.4%	0%	6.7%	0%	0%		2.6%	5.6%	0%	30.8%	0%		2.8%	-
Buses	0	0	0	0		0	1	5	0	0		6	1	0	0	0		1	0	1	0	0		1	-
Buses %	0%	0%	0%	0%		0%	10%	4%	0%	0%		4.2%	10%	0%	0%	0%		2.6%	0%	0.7%	0%	0%		0.6%	-
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	1	0		1	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0%	7.7%	0%		0.6%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	5	-	-	-	-	-	2	-	-	-	-	-	23	-	-	-	-	-	6	-	-
Pedestrians%	-	-	-	-	13.9%		-	-	-	-	5.6%		-	-	-	-	63.9%		-	-	-	-	16.7%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Spectrum

Turning Movement Count
Location Name: KIRWIN AVE & JAGUAR VALLEY DR
Date: Tue, Jan 31, 2023 Deployment Lead: Peter Ilias

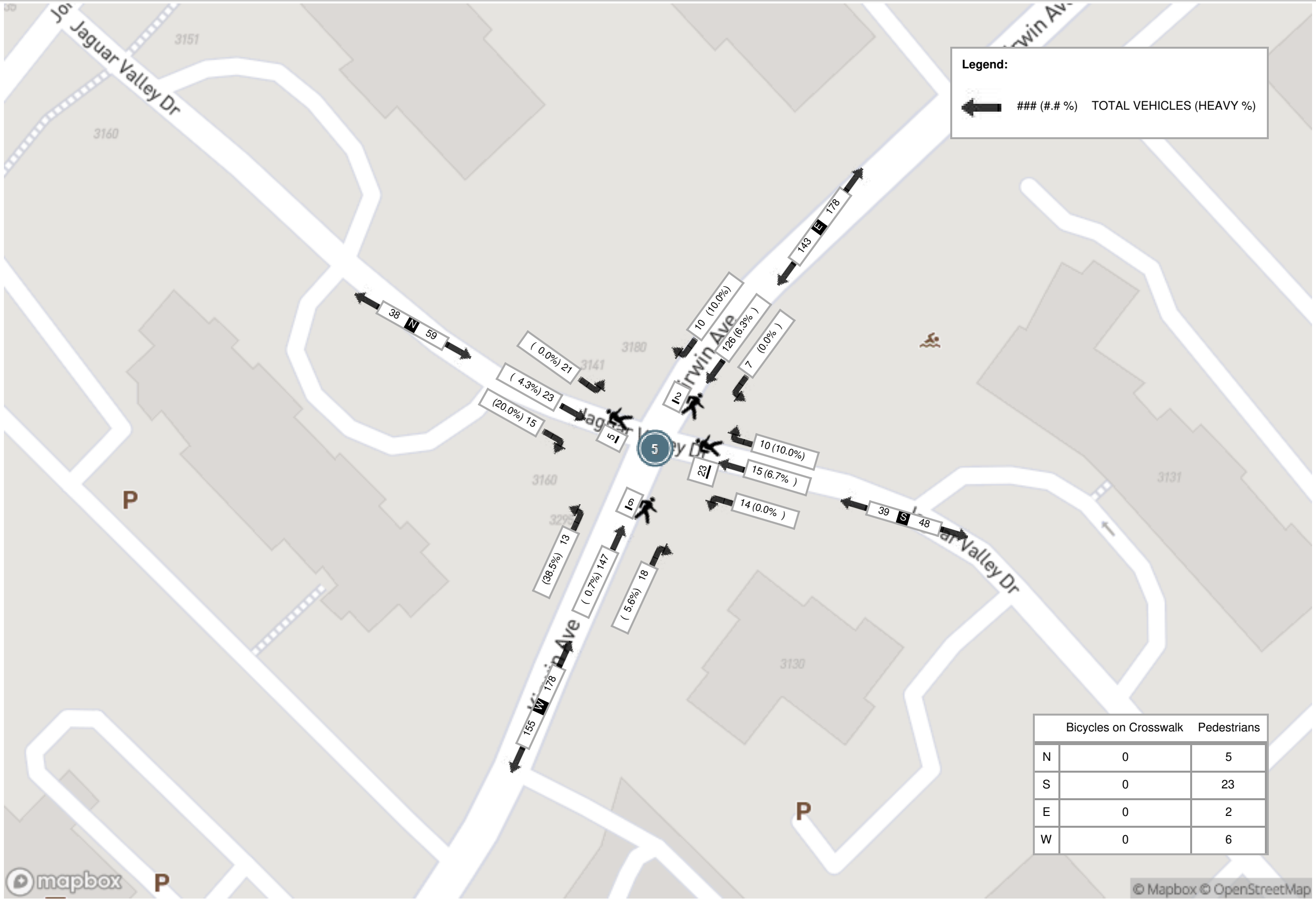
Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:00 PM - 05:00 PM Weather: Broken Clouds (-5.38 °C)

Start Time	N Approach JAGUAR VALLEY DR						E Approach KIRWIN AVE						S Approach JAGUAR VALLEY DR						W Approach KIRWIN AVE						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:00:00	1	3	6	0	1	10	4	80	1	0	0	85	12	10	9	0	2	31	6	38	5	0	4	49	175
16:15:00	8	4	1	0	3	13	1	71	8	0	1	80	5	7	6	0	4	18	12	40	11	0	1	63	174
16:30:00	4	7	2	0	0	13	3	64	2	0	4	69	6	6	14	0	3	26	10	37	6	0	5	53	161
16:45:00	2	8	3	0	4	13	5	51	3	0	4	59	3	9	12	0	4	24	15	27	6	0	3	48	144
Grand Total	15	22	12	0	8	49	13	266	14	0	9	293	26	32	41	0	13	99	43	142	28	0	13	213	**654**
Approach%	30.6%	44.9%	24.5%	0%		-	4.4%	90.8%	4.8%	0%		-	26.3%	32.3%	41.4%	0%		-	20.2%	66.7%	13.1%	0%		-	-
Totals %	2.3%	3.4%	1.8%	0%		7.5%	2%	40.7%	2.1%	0%		44.8%	4%	4.9%	6.3%	0%		15.1%	6.6%	21.7%	4.3%	0%		32.6%	-
PHF	0.47	0.69	0.5	0		0.94	0.65	0.83	0.44	0		0.86	0.54	0.8	0.73	0		0.8	0.72	0.89	0.64	0		0.85	-
Heavy	2	0	0	0		2	0	1	0	0		1	0	0	0	0		0	0	2	8	0		10	-
Heavy %	13.3%	0%	0%	0%		4.1%	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	1.4%	28.6%	0%		4.7%	-
Lights	13	22	12	0		47	13	264	14	0		291	26	32	41	0		99	43	139	20	0		202	-
Lights %	86.7%	100%	100%	0%		95.9%	100%	99.2%	100%	0%		99.3%	100%	100%	100%	0%		100%	100%	97.9%	71.4%	0%		94.8%	-
Single-Unit Trucks	2	0	0	0		2	0	0	0	0		0	0	0	0	0		0	0	1	5	0		6	-
Single-Unit Trucks %	13.3%	0%	0%	0%		4.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.7%	17.9%	0%		2.8%	-
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	1	1	0		2	-
Buses %	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.7%	3.6%	0%		0.9%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	2	0		2	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	7.1%	0%		0.9%	-
Bicycles on Road	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.5%	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	9	-	-	-	-	-	13	-	-	-	-	-	13	-	-
Pedestrians%	-	-	-	-	18.6%		-	-	-	-	20.9%		-	-	-	-	30.2%		-	-	-	-	30.2%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:30 AM - 09:30 AM Weather: Broken Clouds (-13.36 °C)

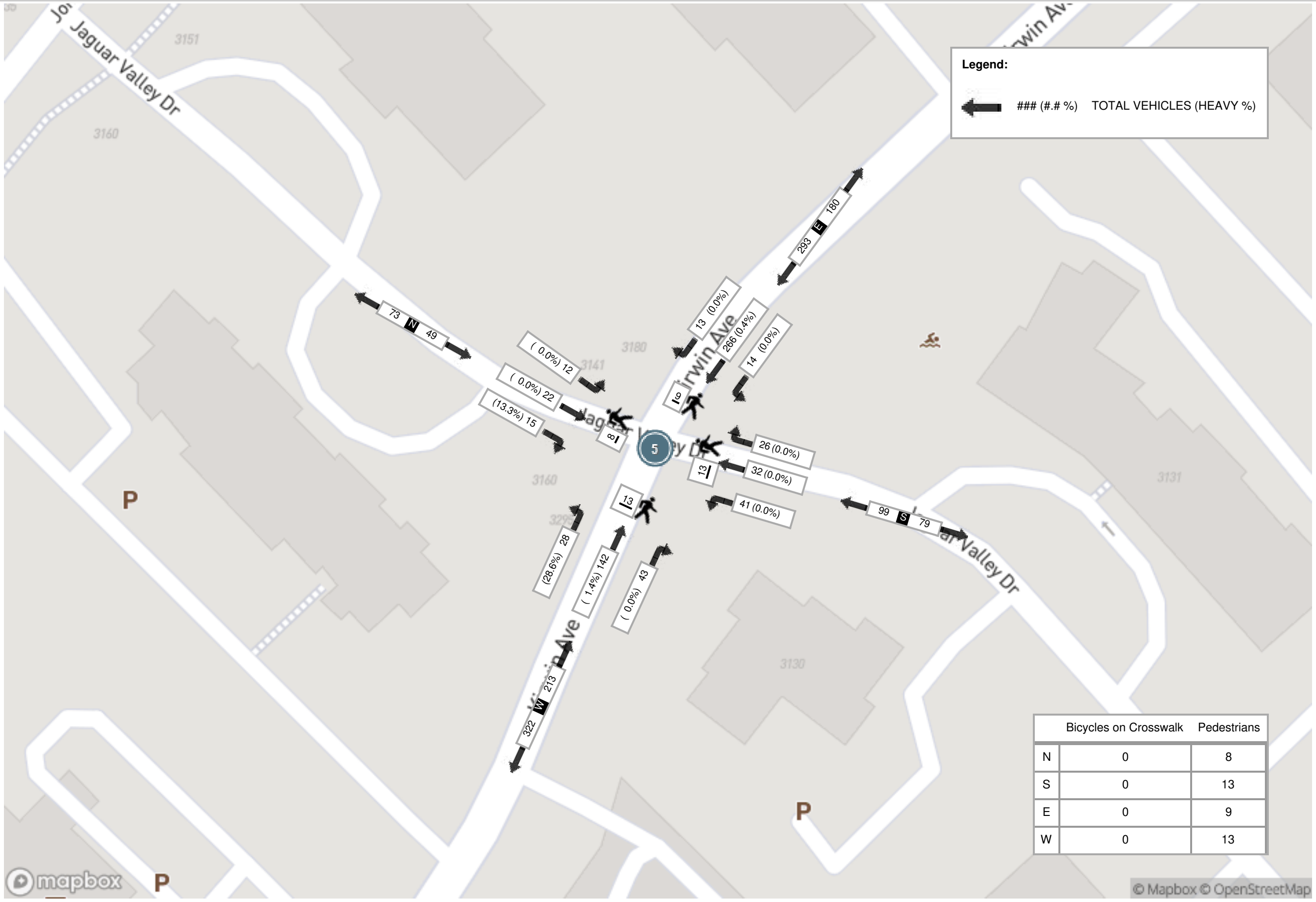


	Bicycles on Crosswalk	Pedestrians
N	0	5
S	0	23
E	0	2
W	0	6

Turning Movement Count
Location Name: KIRWIN AVE & JAGUAR VALLEY DR
Date: Tue, Jan 31, 2023 Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:00 PM - 05:00 PM Weather: Broken Clouds (-5.38 °C)



Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (1 . JOHN ST & LITTLE JOHN LN)

Start Time	E Approach JOHN ST					S Approach LITTLE JOHN LN					W Approach JOHN ST					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
06:30:00	2	1	0	1	3	1	11	0	0	12	4	1	0	0	5	20	
06:45:00	3	0	0	1	3	0	11	0	1	11	5	0	0	0	5	19	
07:00:00	1	0	0	0	1	0	9	1	0	10	11	0	0	0	11	22	
07:15:00	7	4	0	0	11	1	12	0	0	13	6	2	0	0	8	32	93
07:30:00	9	2	0	1	11	0	13	0	5	13	10	2	0	1	12	36	109
07:45:00	4	7	0	0	11	2	15	0	1	17	10	0	0	1	10	38	128
08:00:00	4	2	0	2	6	0	31	0	6	31	17	4	0	0	21	58	164
08:15:00	4	4	0	0	8	0	31	0	3	31	22	1	0	0	23	62	194
08:30:00	7	5	0	1	12	2	33	0	1	35	15	6	0	1	21	68	226
08:45:00	3	0	0	0	3	0	21	0	5	21	16	1	0	0	17	41	229
09:00:00	1	0	0	0	1	4	34	0	2	38	25	7	0	1	32	71	242
09:15:00	3	0	0	0	3	0	19	0	1	19	17	0	0	0	17	39	219
BREAK																	
15:30:00	1	1	0	0	2	0	33	0	8	33	21	5	0	0	26	61	
15:45:00	5	0	0	0	5	2	41	0	4	43	14	1	0	0	15	63	
16:00:00	2	1	0	3	3	5	35	0	1	40	17	5	0	2	22	65	
16:15:00	3	1	0	0	4	2	25	1	5	28	16	0	0	0	16	48	237
16:30:00	1	2	0	0	3	5	36	0	4	41	10	5	0	0	15	59	235
16:45:00	5	2	0	0	7	4	25	0	3	29	15	7	0	0	22	58	230
17:00:00	5	1	0	1	6	2	36	0	4	38	18	8	0	0	26	70	235
17:15:00	3	0	0	0	3	4	31	0	1	35	23	0	0	1	23	61	248
17:30:00	4	2	0	0	6	2	41	0	4	43	17	5	0	0	22	71	260
17:45:00	2	1	0	1	3	3	25	0	7	28	11	6	0	0	17	48	250
18:00:00	5	3	0	0	8	6	20	0	2	26	13	6	0	0	19	53	233
18:15:00	3	1	0	0	4	1	25	0	1	26	16	3	0	0	19	49	221
Grand Total	87	40	0	11	127	46	613	2	69	661	349	75	0	7	424	**1212**	-
Approach%	68.5%	31.5%	0%		-	7%	92.7%	0.3%		-	82.3%	17.7%	0%		-	**-**	-
Totals %	7.2%	3.3%	0%		10.5%	3.8%	50.6%	0.2%		54.5%	28.8%	6.2%	0%		35%	**-**	-
Heavy	1	0	0		-	0	11	0		-	10	1	0		-	**-**	-
Heavy %	1.1%	0%	0%		-	0%	1.8%	0%		-	2.9%	1.3%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (-13.36 °C)

Start Time	E Approach JOHN ST					S Approach LITTLE JOHN LN					W Approach JOHN ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:15:00	4	4	0	0	8	0	31	0	3	31	22	1	0	0	23	62
08:30:00	7	5	0	1	12	2	33	0	1	35	15	6	0	1	21	68
08:45:00	3	0	0	0	3	0	21	0	5	21	16	1	0	0	17	41
09:00:00	1	0	0	0	1	4	34	0	2	38	25	7	0	1	32	71
Grand Total	15	9	0	1	24	6	119	0	11	125	78	15	0	2	93	**242**
Approach%	62.5%	37.5%	0%		-	4.8%	95.2%	0%		-	83.9%	16.1%	0%		-	-
Totals %	6.2%	3.7%	0%		9.9%	2.5%	49.2%	0%		51.7%	32.2%	6.2%	0%		38.4%	-
PHF	0.54	0.45	0		0.5	0.38	0.88	0		0.82	0.78	0.54	0		0.73	-
Heavy	0	0	0		0	0	1	0		1	1	0	0		1	-
Heavy %	0%	0%	0%		0%	0%	0.8%	0%		0.8%	1.3%	0%	0%		1.1%	-
Lights	15	9	0		24	6	118	0		124	77	15	0		92	-
Lights %	100%	100%	0%		100%	100%	99.2%	0%		99.2%	98.7%	100%	0%		98.9%	-
Single-Unit Trucks	0	0	0		0	0	1	0		1	0	0	0		0	-
Single-Unit Trucks %	0%	0%	0%		0%	0%	0.8%	0%		0.8%	0%	0%	0%		0%	-
Buses	0	0	0		0	0	0	0		0	1	0	0		1	-
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	1.3%	0%	0%		1.1%	-
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	1	-	-	-	-	11	-	-	-	-	2	-	-
Pedestrians%	-	-	-	7.1%		-	-	-	78.6%		-	-	-	14.3%		-

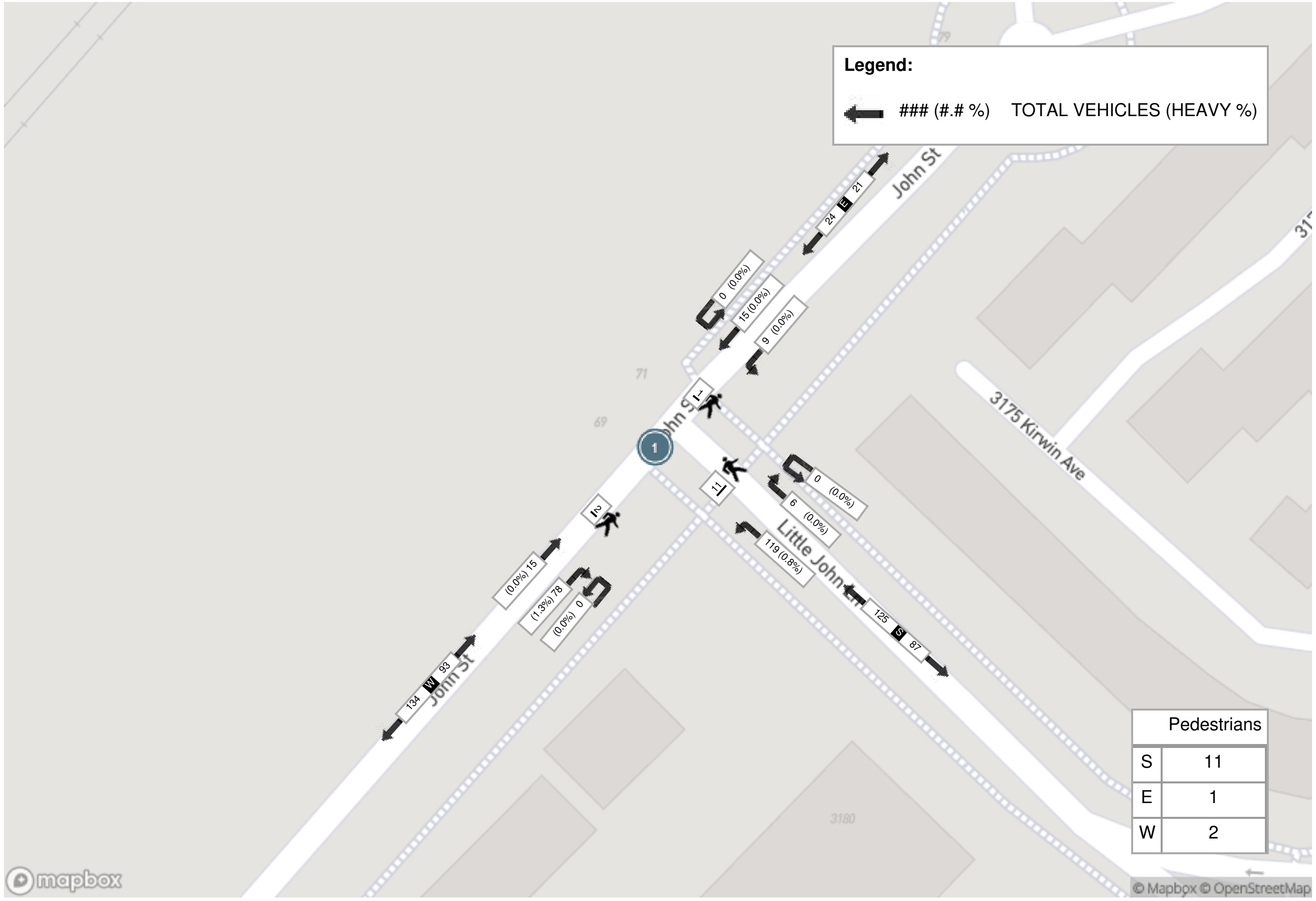
Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Broken Clouds (-5.38 °C)

Start Time	E Approach JOHN ST					S Approach LITTLE JOHN LN					W Approach JOHN ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:45:00	5	2	0	0	7	4	25	0	3	29	15	7	0	0	22	58
17:00:00	5	1	0	1	6	2	36	0	4	38	18	8	0	0	26	70
17:15:00	3	0	0	0	3	4	31	0	1	35	23	0	0	1	23	61
17:30:00	4	2	0	0	6	2	41	0	4	43	17	5	0	0	22	71
Grand Total	17	5	0	1	22	12	133	0	12	145	73	20	0	1	93	**260**
Approach%	77.3%	22.7%	0%		-	8.3%	91.7%	0%		-	78.5%	21.5%	0%		-	-
Totals %	6.5%	1.9%	0%		8.5%	4.6%	51.2%	0%		55.8%	28.1%	7.7%	0%		35.8%	-
PHF	0.85	0.63	0		0.79	0.75	0.81	0		0.84	0.79	0.63	0		0.89	-
Heavy	0	0	0		0	0	1	0		1	0	0	0		0	-
Heavy %	0%	0%	0%		0%	0%	0.8%	0%		0.7%	0%	0%	0%		0%	-
Lights	17	5	0		22	12	132	0		144	73	20	0		93	-
Lights %	100%	100%	0%		100%	100%	99.2%	0%		99.3%	100%	100%	0%		100%	-
Single-Unit Trucks	0	0	0		0	0	0	0		0	0	0	0		0	-
Single-Unit Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Buses	0	0	0		0	0	1	0		1	0	0	0		0	-
Buses %	0%	0%	0%		0%	0%	0.8%	0%		0.7%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	1	-	-	-	-	12	-	-	-	-	1	-	-
Pedestrians%	-	-	-	7.1%		-	-	-	85.7%		-	-	-	7.1%		-

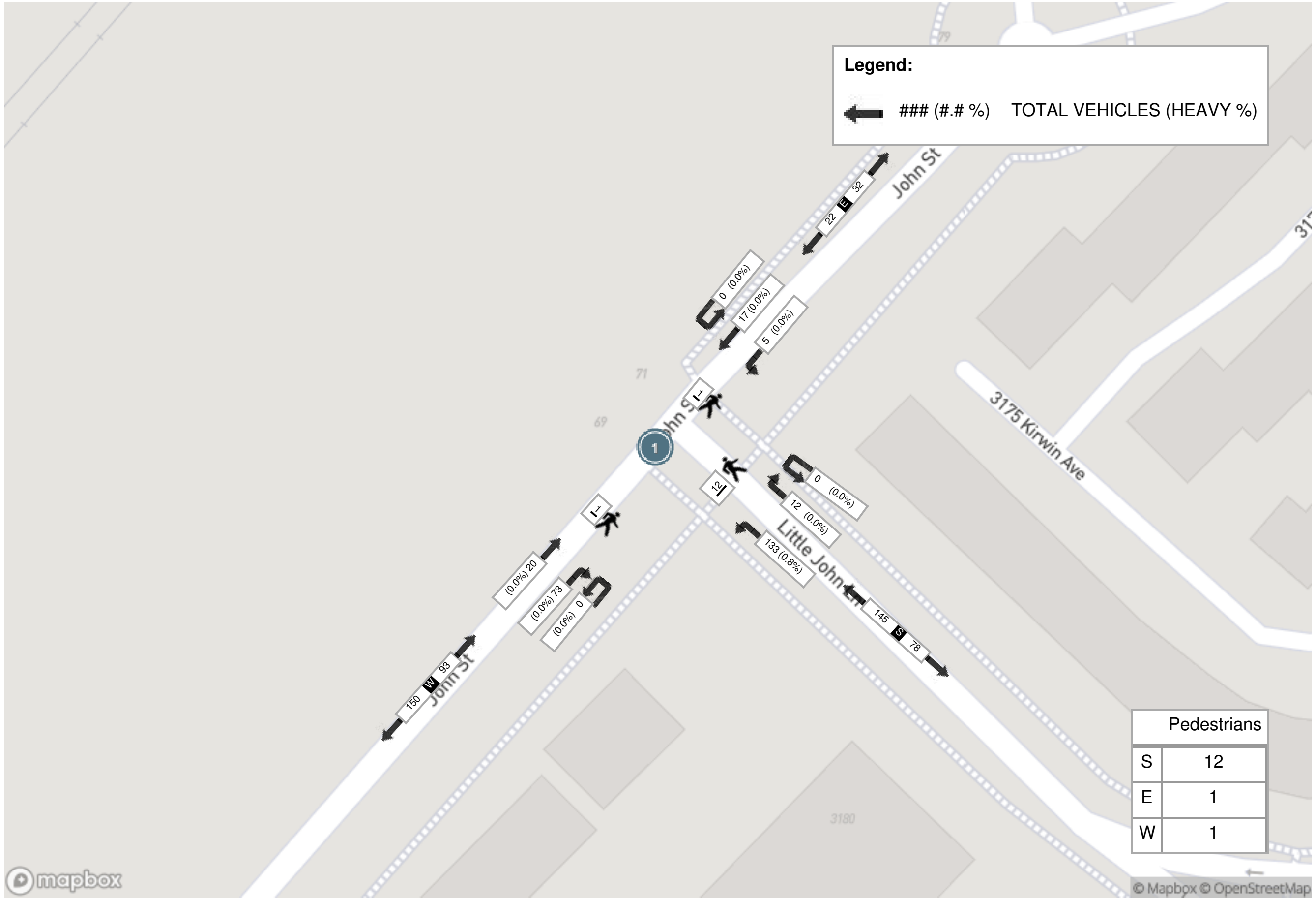
Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (-13.36 °C)



Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Broken Clouds (-5.38 °C)



	Pedestrians
S	12
E	1
W	1

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (2 . KIRWIN AVE & LITTLE JOHN LN)

Start Time	N Approach LITTLE JOHN LN					E Approach KIRWIN AVE					W Approach KIRWIN AVE					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	UTurn E:E	Peds E:	Approach Total	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	0	6	0	0	6	11	4	0	0	15	14	0	0	0	14	35	
06:45:00	5	9	0	0	14	7	5	0	0	12	12	1	0	1	13	39	
07:00:00	1	8	0	1	9	8	13	0	0	21	15	1	0	0	16	46	
07:15:00	5	10	0	0	15	14	10	0	0	24	20	2	0	0	22	61	181
07:30:00	1	14	0	0	15	11	25	0	0	36	25	1	0	0	26	77	223
07:45:00	3	16	0	3	19	15	20	0	1	35	30	1	0	2	31	85	269
08:00:00	6	23	0	2	29	29	27	0	0	56	43	1	0	0	44	129	352
08:15:00	6	23	0	3	29	31	24	0	0	55	45	5	0	0	50	134	425
08:30:00	3	22	0	2	25	33	32	0	0	65	30	0	0	4	30	120	468
08:45:00	5	14	0	2	19	20	25	0	0	45	52	7	0	9	59	123	506
09:00:00	2	25	0	3	27	33	26	0	0	59	51	5	0	3	56	142	519
09:15:00	1	17	0	1	18	15	38	0	0	53	32	2	0	0	34	105	490
BREAK																	
15:30:00	4	19	0	0	23	29	45	0	0	74	37	7	0	0	44	141	
15:45:00	3	12	0	3	15	44	56	0	1	100	37	6	0	5	43	158	
16:00:00	4	13	0	1	17	36	86	0	0	122	45	6	0	2	51	190	
16:15:00	7	17	0	4	24	31	75	0	0	106	42	5	0	12	47	177	666
16:30:00	1	11	0	1	12	43	73	0	0	116	32	7	0	0	39	167	692
16:45:00	3	9	0	2	12	27	53	0	0	80	32	3	0	2	35	127	661
17:00:00	4	21	0	2	25	38	64	0	0	102	42	7	0	6	49	176	647
17:15:00	6	19	0	4	25	39	66	0	0	105	38	5	0	0	43	173	643
17:30:00	5	18	0	1	23	46	71	0	0	117	42	2	0	0	44	184	660
17:45:00	1	13	0	1	14	28	66	0	0	94	30	3	0	0	33	141	674
18:00:00	1	15	0	3	16	24	44	0	0	68	40	4	0	4	44	128	626
18:15:00	1	16	0	0	17	28	49	0	0	77	34	1	0	0	35	129	582
Grand Total	78	370	0	39	448	640	997	0	2	1637	820	82	0	50	902	**2987**	-
Approach%	17.4%	82.6%	0%		-	39.1%	60.9%	0%		-	90.9%	9.1%	0%		-	**-**	-
Totals %	2.6%	12.4%	0%		15%	21.4%	33.4%	0%		54.8%	27.5%	2.7%	0%		30.2%	**-**	-
Heavy	4	9	0		-	14	23	0		-	16	1	0		-	**-**	-
Heavy %	5.1%	2.4%	0%		-	2.2%	2.3%	0%		-	2%	1.2%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:15 AM - 09:15 AM   Weather: Broken Clouds (-13.36 °C)

Start Time	N Approach LITTLE JOHN LN					E Approach KIRWIN AVE					W Approach KIRWIN AVE					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	6	23	0	3	29	31	24	0	0	55	45	5	0	0	50	134
08:30:00	3	22	0	2	25	33	32	0	0	65	30	0	0	4	30	120
08:45:00	5	14	0	2	19	20	25	0	0	45	52	7	0	9	59	123
09:00:00	2	25	0	3	27	33	26	0	0	59	51	5	0	3	56	142
Grand Total	16	84	0	10	100	117	107	0	0	224	178	17	0	16	195	**519**
Approach%	16%	84%	0%		-	52.2%	47.8%	0%		-	91.3%	8.7%	0%		-	-
Totals %	3.1%	16.2%	0%		19.3%	22.5%	20.6%	0%		43.2%	34.3%	3.3%	0%		37.6%	-
PHF	0.67	0.84	0		0.86	0.89	0.84	0		0.86	0.86	0.61	0		0.83	-
Heavy	0	1	0		1	2	10	0		12	6	0	0		6	-
Heavy %	0%	1.2%	0%		1%	1.7%	9.3%	0%		5.4%	3.4%	0%	0%		3.1%	-
Lights	16	83	0		99	115	97	0		212	172	17	0		189	-
Lights %	100%	98.8%	0%		99%	98.3%	90.7%	0%		94.6%	96.6%	100%	0%		96.9%	-
Single-Unit Trucks	0	0	0		0	1	2	0		3	0	0	0		0	-
Single-Unit Trucks %	0%	0%	0%		0%	0.9%	1.9%	0%		1.3%	0%	0%	0%		0%	-
Buses	0	1	0		1	1	8	0		9	6	0	0		6	-
Buses %	0%	1.2%	0%		1%	0.9%	7.5%	0%		4%	3.4%	0%	0%		3.1%	-
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	10	-	-	-	-	0	-	-	-	-	16	-	-
Pedestrians%	-	-	-	38.5%		-	-	-	0%		-	-	-	61.5%		-

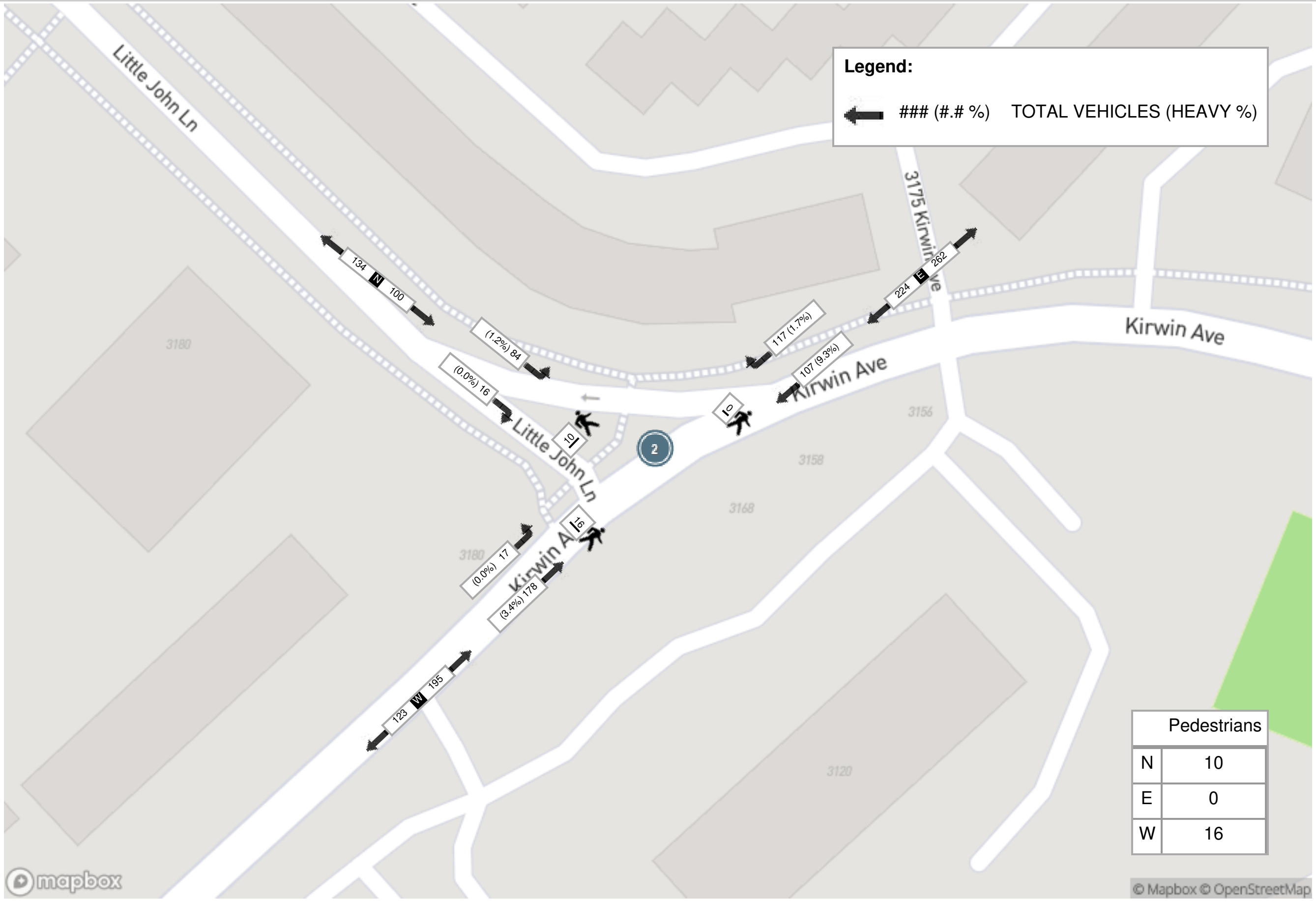
Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 03:45 PM - 04:45 PM Weather: Broken Clouds (-5.38 °C)

Start Time	N Approach LITTLE JOHN LN					E Approach KIRWIN AVE					W Approach KIRWIN AVE					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
15:45:00	3	12	0	3	15	44	56	0	1	100	37	6	0	5	43	158
16:00:00	4	13	0	1	17	36	86	0	0	122	45	6	0	2	51	190
16:15:00	7	17	0	4	24	31	75	0	0	106	42	5	0	12	47	177
16:30:00	1	11	0	1	12	43	73	0	0	116	32	7	0	0	39	167
Grand Total	15	53	0	9	68	154	290	0	1	444	156	24	0	19	180	**692**
Approach%	22.1%	77.9%	0%		-	34.7%	65.3%	0%		-	86.7%	13.3%	0%		-	-
Totals %	2.2%	7.7%	0%		9.8%	22.3%	41.9%	0%		64.2%	22.5%	3.5%	0%		26%	-
PHF	0.54	0.78	0		0.71	0.88	0.84	0		0.91	0.87	0.86	0		0.88	-
Heavy	0	1	0		1	3	4	0		7	2	0	0		2	-
Heavy %	0%	1.9%	0%		1.5%	1.9%	1.4%	0%		1.6%	1.3%	0%	0%		1.1%	-
Lights	15	52	0		67	150	285	0		435	153	24	0		177	-
Lights %	100%	98.1%	0%		98.5%	97.4%	98.3%	0%		98%	98.1%	100%	0%		98.3%	-
Single-Unit Trucks	0	0	0		0	1	0	0		1	1	0	0		1	-
Single-Unit Trucks %	0%	0%	0%		0%	0.6%	0%	0%		0.2%	0.6%	0%	0%		0.6%	-
Buses	0	1	0		1	2	4	0		6	1	0	0		1	-
Buses %	0%	1.9%	0%		1.5%	1.3%	1.4%	0%		1.4%	0.6%	0%	0%		0.6%	-
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0		0	1	1	0		2	1	0	0		1	-
Bicycles on Road %	0%	0%	0%		0%	0.6%	0.3%	0%		0.5%	0.6%	0%	0%		0.6%	-
Pedestrians	-	-	-	9	-	-	-	-	1	-	-	-	-	19	-	-
Pedestrians%	-	-	-	31%		-	-	-	3.4%		-	-	-	65.5%		-

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (-13.36 °C)



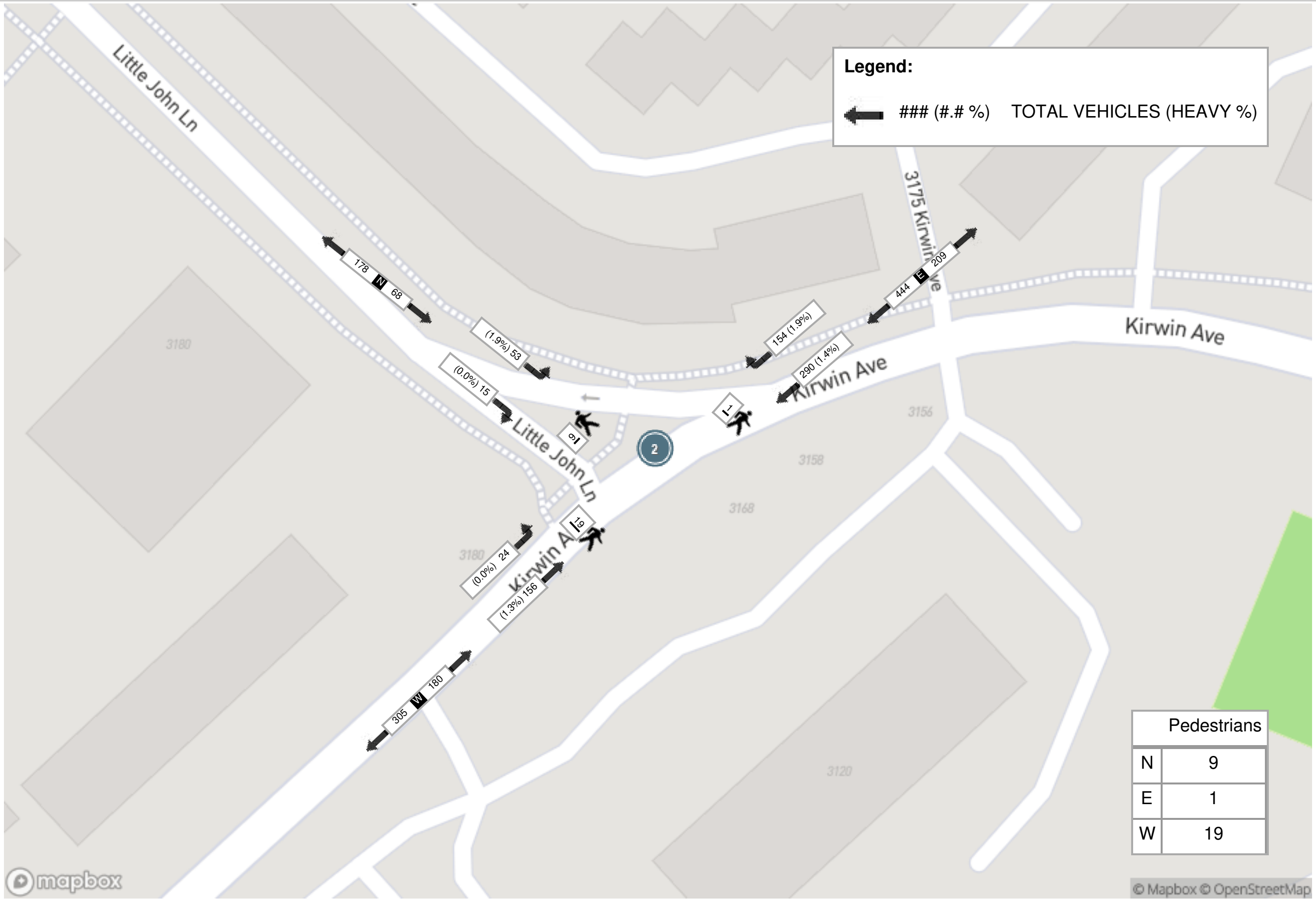
Pedestrians	
N	10
E	0
W	16

Spectrum

Turning Movement Count
Location Name: KIRWIN AVE & LITTLE JOHN LN
Date: Tue, Jan 31, 2023 Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 03:45 PM - 04:45 PM Weather: Broken Clouds (-5.38 °C)



	Pedestrians
N	9
E	1
W	19

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (4 . DUNDAS ST & KIRWIN AVE)

Start Time	N Approach KIRWIN AVE						E Approach DUNDAS ST E						S Approach CAMILLA RD						W Approach DUNDAS ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	8	2	18	0	1	28	8	51	5	0	0	64	10	1	1	0	0	12	4	140	1	0	0	145	249	
06:45:00	4	6	18	0	0	28	8	68	4	0	1	80	9	1	2	0	0	12	6	135	1	0	3	142	262	
07:00:00	7	5	16	0	0	28	12	75	3	0	0	90	7	4	3	0	0	14	5	112	1	0	2	118	250	
07:15:00	8	5	20	0	0	33	17	64	4	0	1	85	11	5	4	0	3	20	2	159	2	0	2	163	301	1062
07:30:00	2	8	48	0	1	58	19	100	11	0	0	130	14	9	5	0	0	28	11	183	2	0	4	196	412	1225
07:45:00	4	9	36	0	0	49	23	88	7	0	1	118	21	4	2	0	2	27	13	244	1	0	2	258	452	1415
08:00:00	6	22	36	0	1	64	27	113	11	0	0	151	16	15	12	0	0	43	23	266	4	0	3	293	551	1716
08:15:00	4	34	54	0	4	92	30	125	14	0	1	169	16	26	24	0	1	66	17	245	3	0	2	265	592	2007
08:30:00	3	14	39	0	0	56	35	139	13	0	0	187	16	22	8	0	0	46	13	268	6	0	3	287	576	2171
08:45:00	4	17	54	0	0	75	28	175	13	0	0	216	16	17	18	0	2	51	15	240	3	0	1	258	600	2319
09:00:00	6	30	46	0	2	82	33	152	15	0	2	200	23	22	10	0	2	55	14	220	5	0	9	239	576	2344
09:15:00	6	22	29	0	4	57	30	172	11	1	0	214	12	19	8	0	1	39	10	226	2	0	2	238	548	2300
BREAK																										
15:30:00	11	23	28	0	8	62	67	229	13	0	3	309	12	19	12	0	3	43	13	182	6	0	4	201	615	
15:45:00	1	13	33	0	6	47	75	217	20	0	1	312	20	32	10	0	2	62	10	173	10	0	7	193	614	
16:00:00	4	17	32	0	6	53	87	203	39	0	0	329	15	28	9	0	1	52	11	151	2	0	2	164	598	
16:15:00	9	18	39	0	6	66	82	211	23	0	1	316	18	22	7	0	1	47	11	191	14	0	4	216	645	2472
16:30:00	12	14	26	0	0	52	88	258	15	0	3	361	14	27	5	0	2	46	8	182	10	0	8	200	659	2516
16:45:00	5	9	25	0	3	39	57	268	19	0	2	344	16	23	14	0	4	53	12	179	13	0	1	204	640	2542
17:00:00	14	26	27	0	5	67	80	229	18	0	2	327	29	36	17	1	2	83	7	172	9	1	6	189	666	2610
17:15:00	6	17	30	0	4	53	86	251	29	0	3	366	19	22	7	0	3	48	8	199	6	0	2	213	680	2645
17:30:00	4	29	26	0	4	59	71	248	34	0	3	353	10	42	14	0	4	66	15	176	7	0	5	198	676	2662
17:45:00	6	18	30	0	3	54	69	221	13	0	2	303	8	29	8	0	4	45	7	176	5	1	1	189	591	2613
18:00:00	7	13	28	0	6	48	48	250	12	1	0	311	11	17	4	0	2	32	9	192	7	0	7	208	599	2546
18:15:00	5	17	32	0	4	54	58	205	20	0	3	283	16	19	9	0	3	44	6	173	6	0	4	185	566	2432
Grand Total	146	388	770	0	68	1304	1138	4112	366	2	29	5618	359	461	213	1	42	1034	250	4584	126	2	84	4962	**12918**	-
Approach%	11.2%	29.8%	59%	0%		-	20.3%	73.2%	6.5%	0%		-	34.7%	44.6%	20.6%	0.1%		-	5%	92.4%	2.5%	0%		-	-	-
Totals %	1.1%	3%	6%	0%		10.1%	8.8%	31.8%	2.8%	0%		43.5%	2.8%	3.6%	1.6%	0%		8%	1.9%	35.5%	1%	0%		38.4%	-	-
Heavy	2	9	13	0		-	21	157	6	0		-	8	11	8	0		-	10	168	4	0		-	-	-
Heavy %	1.4%	2.3%	1.7%	0%		-	1.8%	3.8%	1.6%	0%		-	2.2%	2.4%	3.8%	0%		-	4%	3.7%	3.2%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (-13.36 °C)

Start Time	N Approach KIRWIN AVE						E Approach DUNDAS ST E						S Approach CAMILLA RD						W Approach DUNDAS ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	4	34	54	0	4	92	30	125	14	0	1	169	16	26	24	0	1	66	17	245	3	0	2	265	592
08:30:00	3	14	39	0	0	56	35	139	13	0	0	187	16	22	8	0	0	46	13	268	6	0	3	287	576
08:45:00	4	17	54	0	0	75	28	175	13	0	0	216	16	17	18	0	2	51	15	240	3	0	1	258	600
09:00:00	6	30	46	0	2	82	33	152	15	0	2	200	23	22	10	0	2	55	14	220	5	0	9	239	576
Grand Total	17	95	193	0	6	305	126	591	55	0	3	772	71	87	60	0	5	218	59	973	17	0	15	1049	**2344**
Approach%	5.6%	31.1%	63.3%	0%		-	16.3%	76.6%	7.1%	0%		-	32.6%	39.9%	27.5%	0%		-	5.6%	92.8%	1.6%	0%		-	-
Totals %	0.7%	4.1%	8.2%	0%		13%	5.4%	25.2%	2.3%	0%		32.9%	3%	3.7%	2.6%	0%		9.3%	2.5%	41.5%	0.7%	0%		44.8%	-
PHF	0.71	0.7	0.89	0		0.83	0.9	0.84	0.92	0		0.89	0.77	0.84	0.63	0		0.83	0.87	0.91	0.71	0		0.91	-
Heavy	0	3	5	0		8	8	37	0	0		45	4	1	2	0		7	3	37	2	0		42	-
Heavy %	0%	3.2%	2.6%	0%		2.6%	6.3%	6.3%	0%	0%		5.8%	5.6%	1.1%	3.3%	0%		3.2%	5.1%	3.8%	11.8%	0%		4%	-
Lights	17	92	188	0		297	118	554	55	0		727	67	86	58	0		211	56	936	15	0		1007	-
Lights %	100%	96.8%	97.4%	0%		97.4%	93.7%	93.7%	100%	0%		94.2%	94.4%	98.9%	96.7%	0%		96.8%	94.9%	96.2%	88.2%	0%		96%	-
Single-Unit Trucks	0	0	0	0		0	2	16	0	0		18	1	0	1	0		2	0	17	0	0		17	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	1.6%	2.7%	0%	0%		2.3%	1.4%	0%	1.7%	0%		0.9%	0%	1.7%	0%	0%		1.6%	-
Buses	0	3	5	0		8	6	16	0	0		22	3	1	1	0		5	3	13	2	0		18	-
Buses %	0%	3.2%	2.6%	0%		2.6%	4.8%	2.7%	0%	0%		2.8%	4.2%	1.1%	1.7%	0%		2.3%	5.1%	1.3%	11.8%	0%		1.7%	-
Articulated Trucks	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	7	0	0		7	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.6%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	5	-	-	-	-	-	2	-	-	-	-	-	5	-	-	-	-	-	15	-	-
Pedestrians%	-	-	-	-	17.2%		-	-	-	-	6.9%		-	-	-	-	17.2%		-	-	-	-	51.7%		-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	3.4%		-	-	-	-	3.4%		-	-	-	-	0%		-	-	-	-	0%		-

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

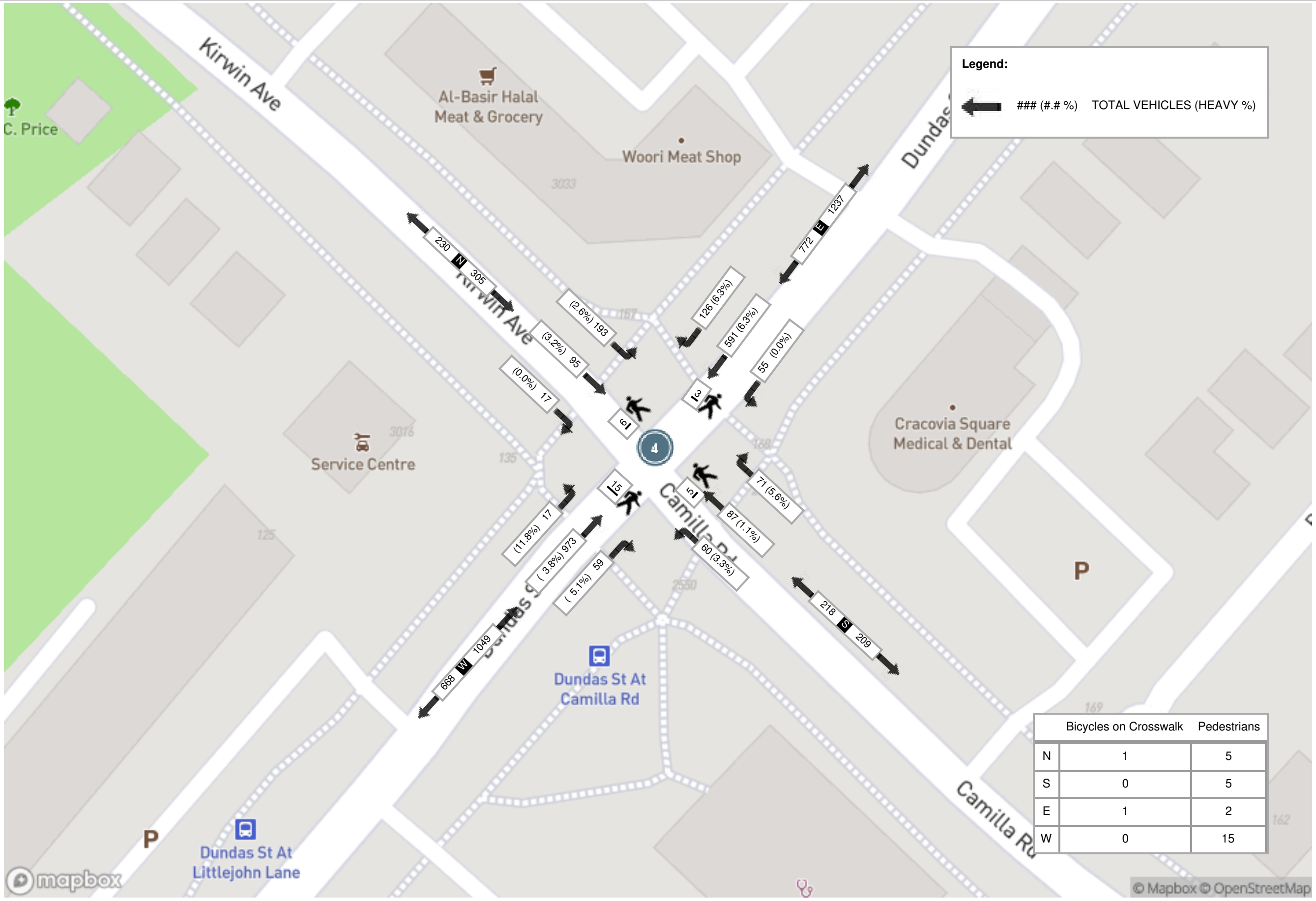
Peak Hour: 04:45 PM - 05:45 PM Weather: Broken Clouds (-5.38 °C)

Start Time	N Approach KIRWIN AVE						E Approach DUNDAS ST E						S Approach CAMILLA RD						W Approach DUNDAS ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	5	9	25	0	3	39	57	268	19	0	2	344	16	23	14	0	4	53	12	179	13	0	1	204	640
17:00:00	14	26	27	0	5	67	80	229	18	0	2	327	29	36	17	1	2	83	7	172	9	1	6	189	666
17:15:00	6	17	30	0	4	53	86	251	29	0	3	366	19	22	7	0	3	48	8	199	6	0	2	213	680
17:30:00	4	29	26	0	4	59	71	248	34	0	3	353	10	42	14	0	4	66	15	176	7	0	5	198	676
Grand Total	29	81	108	0	16	218	294	996	100	0	10	1390	74	123	52	1	13	250	42	726	35	1	14	804	**2662**
Approach%	13.3%	37.2%	49.5%	0%		-	21.2%	71.7%	7.2%	0%		-	29.6%	49.2%	20.8%	0.4%		-	5.2%	90.3%	4.4%	0.1%		-	-
Totals %	1.1%	3%	4.1%	0%		8.2%	11%	37.4%	3.8%	0%		52.2%	2.8%	4.6%	2%	0%		9.4%	1.6%	27.3%	1.3%	0%		30.2%	-
PHF	0.52	0.7	0.9	0		0.81	0.85	0.93	0.74	0		0.95	0.64	0.73	0.76	0.25		0.75	0.7	0.91	0.67	0.25		0.94	-
Heavy	1	0	1	0		2	1	18	0	0		19	0	0	0	0		0	2	23	0	0		25	-
Heavy %	3.4%	0%	0.9%	0%		0.9%	0.3%	1.8%	0%	0%		1.4%	0%	0%	0%	0%		0%	4.8%	3.2%	0%	0%		3.1%	-
Lights	28	81	107	0		216	293	976	100	0		1369	74	123	52	1		250	40	703	35	1		779	-
Lights %	96.6%	100%	99.1%	0%		99.1%	99.7%	98%	100%	0%		98.5%	100%	100%	100%	100%		100%	95.2%	96.8%	100%	100%		96.9%	-
Single-Unit Trucks	1	0	0	0		1	1	5	0	0		6	0	0	0	0		0	2	8	0	0		10	-
Single-Unit Trucks %	3.4%	0%	0%	0%		0.5%	0.3%	0.5%	0%	0%		0.4%	0%	0%	0%	0%		0%	4.8%	1.1%	0%	0%		1.2%	-
Buses	0	0	1	0		1	0	11	0	0		11	0	0	0	0		0	0	13	0	0		13	-
Buses %	0%	0%	0.9%	0%		0.5%	0%	1.1%	0%	0%		0.8%	0%	0%	0%	0%		0%	0%	1.8%	0%	0%		1.6%	-
Articulated Trucks	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	2	0	0		2	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.2%	-
Bicycles on Road	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	16	-	-	-	-	-	10	-	-	-	-	-	13	-	-	-	-	-	14	-	-
Pedestrians%	-	-	-	-	30.2%		-	-	-	-	18.9%		-	-	-	-	24.5%		-	-	-	-	26.4%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Turning Movement Count
Location Name: DUNDAS ST & KIRWIN AVE
Date: Tue, Jan 31, 2023 Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Broken Clouds (-13.36 °C)

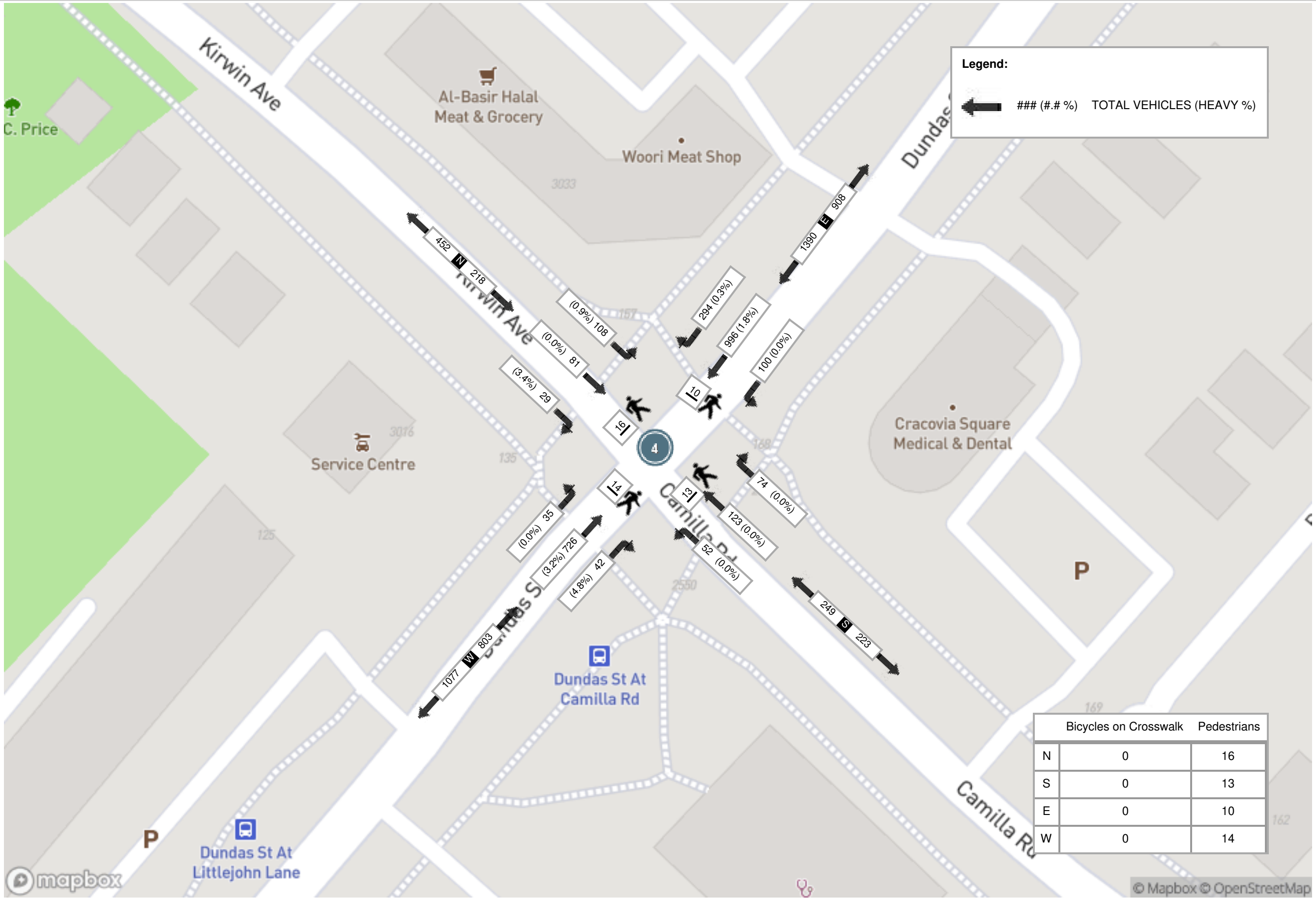


	Bicycles on Crosswalk	Pedestrians
N	1	5
S	0	5
E	1	2
W	0	15

Turning Movement Count
Location Name: DUNDAS ST & KIRWIN AVE
Date: Tue, Jan 31, 2023   Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:45 PM - 05:45 PM   Weather: Broken Clouds (-5.38 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	16
S	0	13
E	0	10
W	0	14

Turning Movement Count
Location Name: HURONTARIO ST & KIRWIN AVE / HILLCREST AVE
Date: Thu, Feb 08, 2024 Deployment Lead: David Chu

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Turning Movement Count (2 . HURONTARIO ST & KIRWIN AVE / HILLCREST AVE)

Start Time	N Approach HURONTARIO ST						E Approach KIRWIN AVE						S Approach HURONTARIO ST						W Approach HILLCREST AVE						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	3	48	5	0	2	56	4	8	1	0	2	13	0	78	2	0	1	80	7	10	7	0	0	24	173	
06:45:00	5	63	4	1	0	73	8	9	1	0	0	18	1	64	4	0	1	69	11	13	5	0	1	29	189	
07:00:00	0	70	1	0	0	71	9	10	1	0	2	20	2	71	5	0	5	78	11	14	7	0	1	32	201	
07:15:00	4	84	5	0	4	93	9	18	1	0	4	28	1	75	8	0	2	84	10	15	9	0	2	34	239	802
07:30:00	5	89	1	0	2	95	4	15	6	0	2	25	3	91	7	0	2	101	14	22	6	0	3	42	263	892
07:45:00	4	118	2	0	3	124	7	14	4	0	3	25	2	77	5	0	5	84	11	27	8	0	8	46	279	982
08:00:00	6	128	1	1	9	136	7	29	4	0	12	40	3	103	14	0	15	120	11	13	5	0	44	29	325	1106
08:15:00	2	150	2	0	9	154	9	19	7	0	8	35	2	126	7	0	11	135	32	28	10	0	53	70	394	1261
08:30:00	6	115	6	0	3	127	7	25	5	0	13	37	1	99	11	0	8	111	18	25	11	0	13	54	329	1327
08:45:00	5	109	4	2	4	120	13	23	3	0	6	39	7	76	10	0	2	93	19	34	6	0	12	59	311	1359
09:00:00	5	142	12	1	1	160	5	17	6	0	7	28	5	76	10	0	3	91	21	28	13	0	5	62	341	1375
09:15:00	1	99	7	0	0	107	15	25	1	0	6	41	6	68	7	0	2	81	16	32	19	0	4	67	296	1277
BREAK																										
15:30:00	6	135	7	0	5	148	12	36	6	0	18	54	7	132	18	0	11	157	21	28	9	0	6	58	417	
15:45:00	1	101	7	1	6	110	22	55	8	0	15	85	3	126	25	0	13	154	21	55	6	0	12	82	431	
16:00:00	3	97	8	0	8	108	9	34	3	0	23	46	4	130	28	0	18	162	14	27	8	0	16	49	365	
16:15:00	10	104	10	0	13	124	15	67	14	0	18	96	9	87	22	0	5	118	22	47	11	0	18	80	418	1631
16:30:00	6	107	9	0	6	122	13	60	6	0	13	79	8	125	22	1	11	156	14	39	9	0	6	62	419	1633
16:45:00	5	109	7	0	6	121	20	44	9	0	27	73	6	137	25	0	20	168	21	20	12	0	32	53	415	1617
17:00:00	9	147	17	0	3	173	13	73	7	1	20	94	15	120	31	0	15	166	23	32	19	0	2	74	507	1759
17:15:00	7	114	10	0	4	131	13	53	7	0	16	73	6	118	20	0	18	144	20	31	10	0	23	61	409	1750
17:30:00	3	129	10	0	4	142	13	45	10	0	21	68	10	117	22	0	3	149	26	23	19	0	18	68	427	1758
17:45:00	5	81	9	0	11	95	10	42	7	0	17	59	5	119	16	0	13	140	18	40	13	0	16	71	365	1708
18:00:00	8	100	10	0	10	118	20	44	5	0	15	69	12	129	19	0	5	160	34	44	12	1	10	91	438	1639
18:15:00	12	117	9	0	4	138	16	40	4	0	15	60	5	99	16	1	4	121	11	32	11	0	10	54	373	1603
Grand Total	121	2556	163	6	117	2846	273	805	126	1	283	1205	123	2443	354	2	193	2922	426	679	245	1	315	1351	**8324**	-
Approach%	4.3%	89.8%	5.7%	0.2%		-	22.7%	66.8%	10.5%	0.1%		-	4.2%	83.6%	12.1%	0.1%		-	31.5%	50.3%	18.1%	0.1%		-	-	-
Totals %	1.5%	30.7%	2%	0.1%		34.2%	3.3%	9.7%	1.5%	0%		14.5%	1.5%	29.3%	4.3%	0%		35.1%	5.1%	8.2%	2.9%	0%		16.2%	-	-
Heavy	12	146	3	0		-	6	13	5	0		-	4	143	27	0		-	24	8	26	0		-	-	-
Heavy %	9.9%	5.7%	1.8%	0%		-	2.2%	1.6%	4%	0%		-	3.3%	5.9%	7.6%	0%		-	5.6%	1.2%	10.6%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

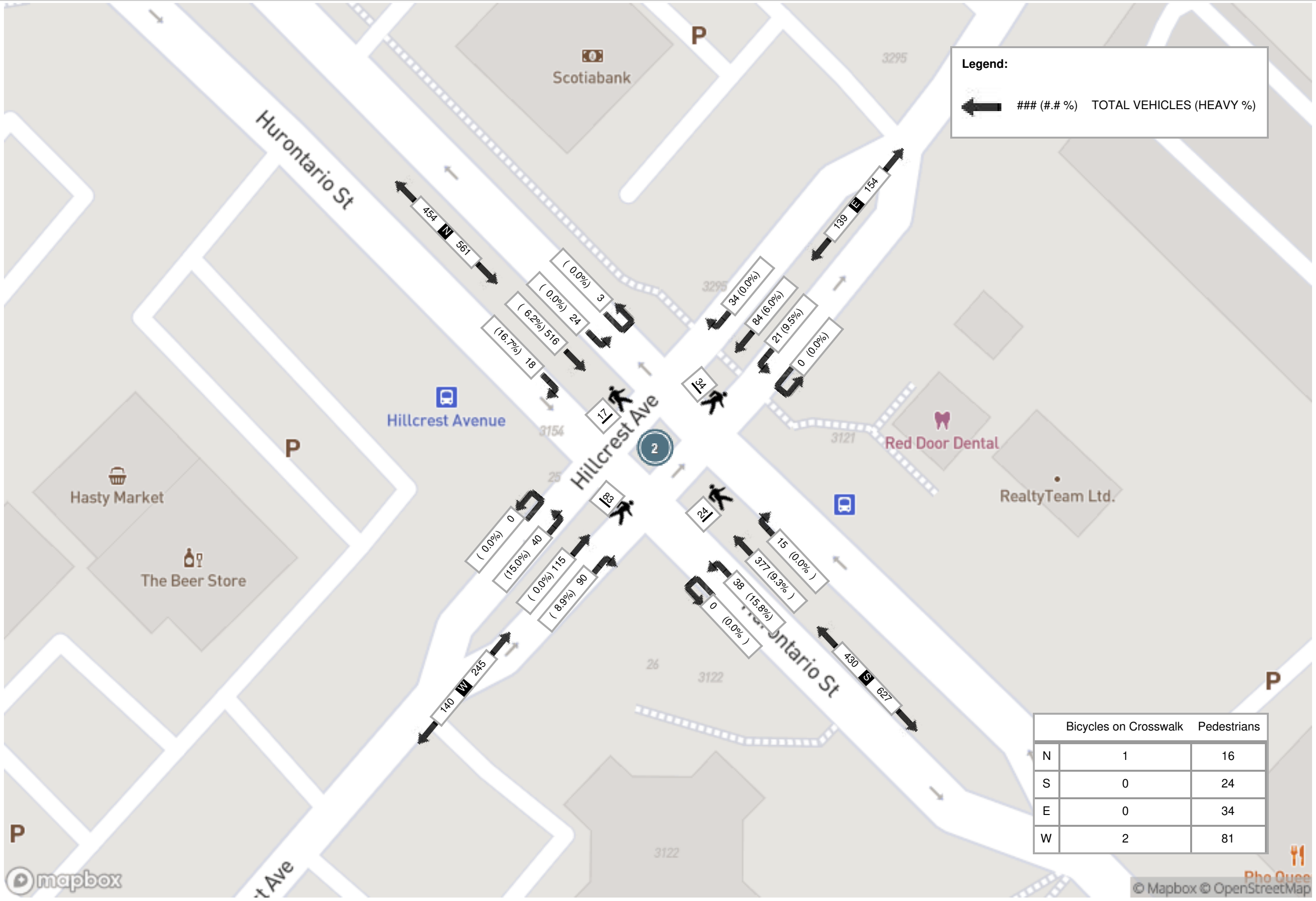
Peak Hour: 08:15 AM - 09:15 AM Weather: Fog (0.24 °C)

Start Time	N Approach HURONTARIO ST						E Approach KIRWIN AVE						S Approach HURONTARIO ST						W Approach HILLCREST AVE						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	2	150	2	0	9	154	9	19	7	0	8	35	2	126	7	0	11	135	32	28	10	0	53	70	394
08:30:00	6	115	6	0	3	127	7	25	5	0	13	37	1	99	11	0	8	111	18	25	11	0	13	54	329
08:45:00	5	109	4	2	4	120	13	23	3	0	6	39	7	76	10	0	2	93	19	34	6	0	12	59	311
09:00:00	5	142	12	1	1	160	5	17	6	0	7	28	5	76	10	0	3	91	21	28	13	0	5	62	341
Grand Total	18	516	24	3	17	561	34	84	21	0	34	139	15	377	38	0	24	430	90	115	40	0	83	245	**1375**
Approach%	3.2%	92%	4.3%	0.5%		-	24.5%	60.4%	15.1%	0%		-	3.5%	87.7%	8.8%	0%		-	36.7%	46.9%	16.3%	0%		-	-
Totals %	1.3%	37.5%	1.7%	0.2%		40.8%	2.5%	6.1%	1.5%	0%		10.1%	1.1%	27.4%	2.8%	0%		31.3%	6.5%	8.4%	2.9%	0%		17.8%	-
PHF	0.75	0.86	0.5	0.38		0.88	0.65	0.84	0.75	0		0.89	0.54	0.75	0.86	0		0.8	0.7	0.85	0.77	0		0.88	-
Heavy	3	32	0	0		35	0	5	2	0		7	0	35	6	0		41	8	0	6	0		14	-
Heavy %	16.7%	6.2%	0%	0%		6.2%	0%	6%	9.5%	0%		5%	0%	9.3%	15.8%	0%		9.5%	8.9%	0%	15%	0%		5.7%	-
Lights	15	484	24	3		526	34	79	19	0		132	15	342	32	0		389	82	115	34	0		231	-
Lights %	83.3%	93.8%	100%	100%		93.8%	100%	94%	90.5%	0%		95%	100%	90.7%	84.2%	0%		90.5%	91.1%	100%	85%	0%		94.3%	-
Single-Unit Trucks	1	18	0	0		19	0	0	0	0		0	0	11	1	0		12	0	0	2	0		2	-
Single-Unit Trucks %	5.6%	3.5%	0%	0%		3.4%	0%	0%	0%	0%		0%	0%	2.9%	2.6%	0%		2.8%	0%	0%	5%	0%		0.8%	-
Buses	1	12	0	0		13	0	5	2	0		7	0	21	5	0		26	8	0	4	0		12	-
Buses %	5.6%	2.3%	0%	0%		2.3%	0%	6%	9.5%	0%		5%	0%	5.6%	13.2%	0%		6%	8.9%	0%	10%	0%		4.9%	-
Articulated Trucks	1	2	0	0		3	0	0	0	0		0	0	3	0	0		3	0	0	0	0		0	-
Articulated Trucks %	5.6%	0.4%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.7%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	16	-	-	-	-	-	34	-	-	-	-	-	24	-	-	-	-	-	81	-	-
Pedestrians%	-	-	-	-	10.1%		-	-	-	-	21.5%		-	-	-	-	15.2%		-	-	-	-	51.3%		-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-
Bicycles on Crosswalk%	-	-	-	-	0.6%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	1.3%		-

Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (5.51 °C)

Start Time	N Approach HURONTARIO ST						E Approach KIRWIN AVE						S Approach HURONTARIO ST						W Approach HILLCREST AVE						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	10	104	10	0	13	124	15	67	14	0	18	96	9	87	22	0	5	118	22	47	11	0	18	80	418
16:30:00	6	107	9	0	6	122	13	60	6	0	13	79	8	125	22	1	11	156	14	39	9	0	6	62	419
16:45:00	5	109	7	0	6	121	20	44	9	0	27	73	6	137	25	0	20	168	21	20	12	0	32	53	415
17:00:00	9	147	17	0	3	173	13	73	7	1	20	94	15	120	31	0	15	166	23	32	19	0	2	74	507
Grand Total	30	467	43	0	28	540	61	244	36	1	78	342	38	469	100	1	51	608	80	138	51	0	58	269	**1759**
Approach%	5.6%	86.5%	8%	0%		-	17.8%	71.3%	10.5%	0.3%		-	6.3%	77.1%	16.4%	0.2%		-	29.7%	51.3%	19%	0%		-	-
Totals %	1.7%	26.5%	2.4%	0%		30.7%	3.5%	13.9%	2%	0.1%		19.4%	2.2%	26.7%	5.7%	0.1%		34.6%	4.5%	7.8%	2.9%	0%		15.3%	-
PHF	0.75	0.79	0.63	0		0.78	0.76	0.84	0.64	0.25		0.89	0.63	0.86	0.81	0.25		0.9	0.87	0.73	0.67	0		0.84	-
Heavy	0	15	0	0		15	2	0	1	0		3	1	14	1	0		16	2	1	3	0		6	-
Heavy %	0%	3.2%	0%	0%		2.8%	3.3%	0%	2.8%	0%		0.9%	2.6%	3%	1%	0%		2.6%	2.5%	0.7%	5.9%	0%		2.2%	-
Lights	30	451	43	0		524	59	244	35	1		339	37	455	99	1		592	78	137	48	0		263	-
Lights %	100%	96.6%	100%	0%		97%	96.7%	100%	97.2%	100%		99.1%	97.4%	97%	99%	100%		97.4%	97.5%	99.3%	94.1%	0%		97.8%	-
Single-Unit Trucks	0	6	0	0		6	2	0	1	0		3	1	5	0	0		6	1	0	0	0		1	-
Single-Unit Trucks %	0%	1.3%	0%	0%		1.1%	3.3%	0%	2.8%	0%		0.9%	2.6%	1.1%	0%	0%		1%	1.3%	0%	0%	0%		0.4%	-
Buses	0	9	0	0		9	0	0	0	0		0	0	9	1	0		10	1	1	3	0		5	-
Buses %	0%	1.9%	0%	0%		1.7%	0%	0%	0%	0%		0%	0%	1.9%	1%	0%		1.6%	1.3%	0.7%	5.9%	0%		1.9%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	28	-	-	-	-	-	78	-	-	-	-	-	51	-	-	-	-	-	58	-	-
Pedestrians%	-	-	-	-	13%		-	-	-	-	36.3%		-	-	-	-	23.7%		-	-	-	-	27%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Peak Hour: 08:15 AM - 09:15 AM Weather: Fog (0.24 °C)

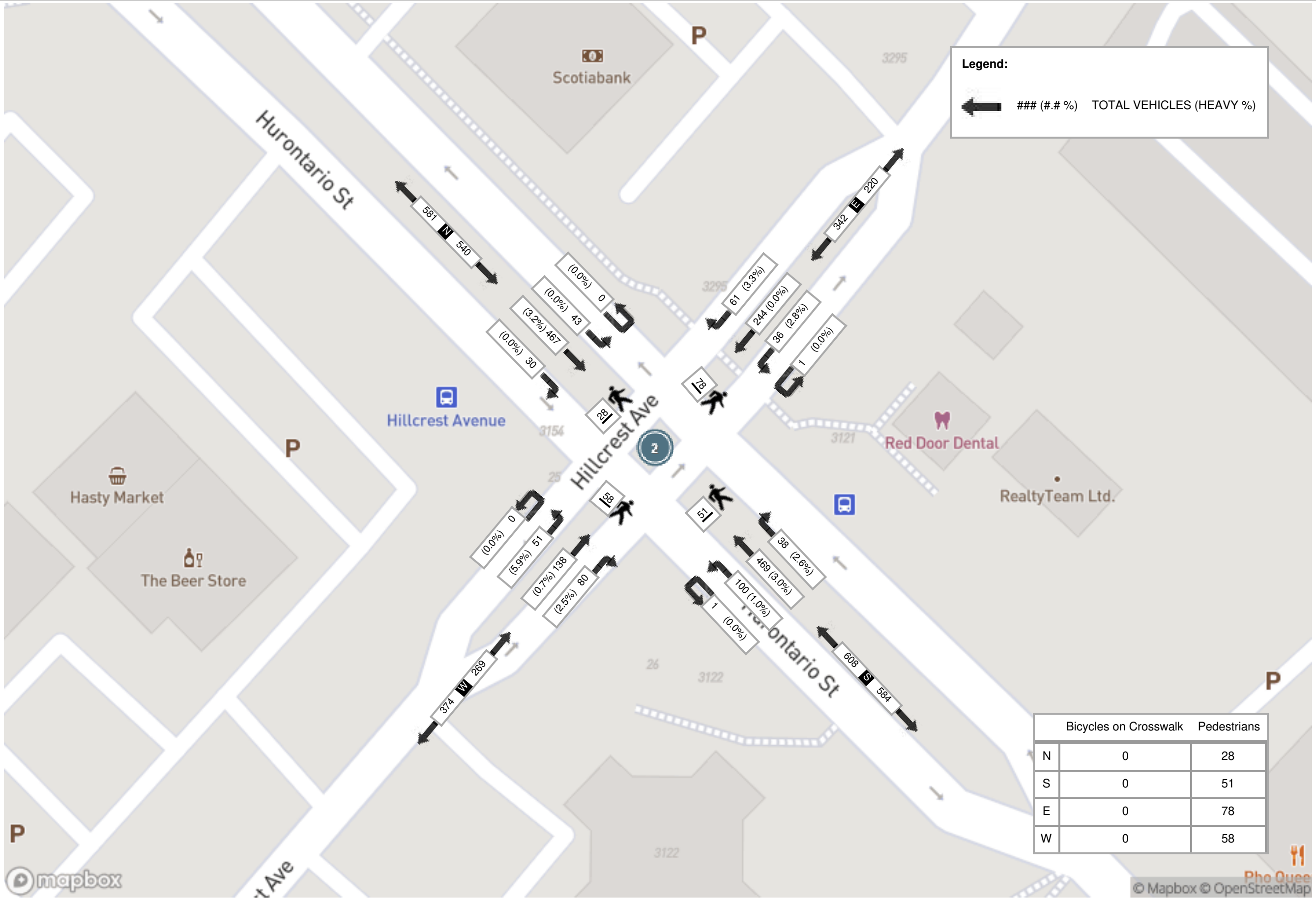


	Bicycles on Crosswalk	Pedestrians
N	1	16
S	0	24
E	0	34
W	2	81

Turning Movement Count
Location Name: HURONTARIO ST & KIRWIN AVE / HILLCREST AVE
Date: Thu, Feb 08, 2024 Deployment Lead: David Chu

Crozier & Associates
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (5.51 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	28
S	0	51
E	0	78
W	0	58

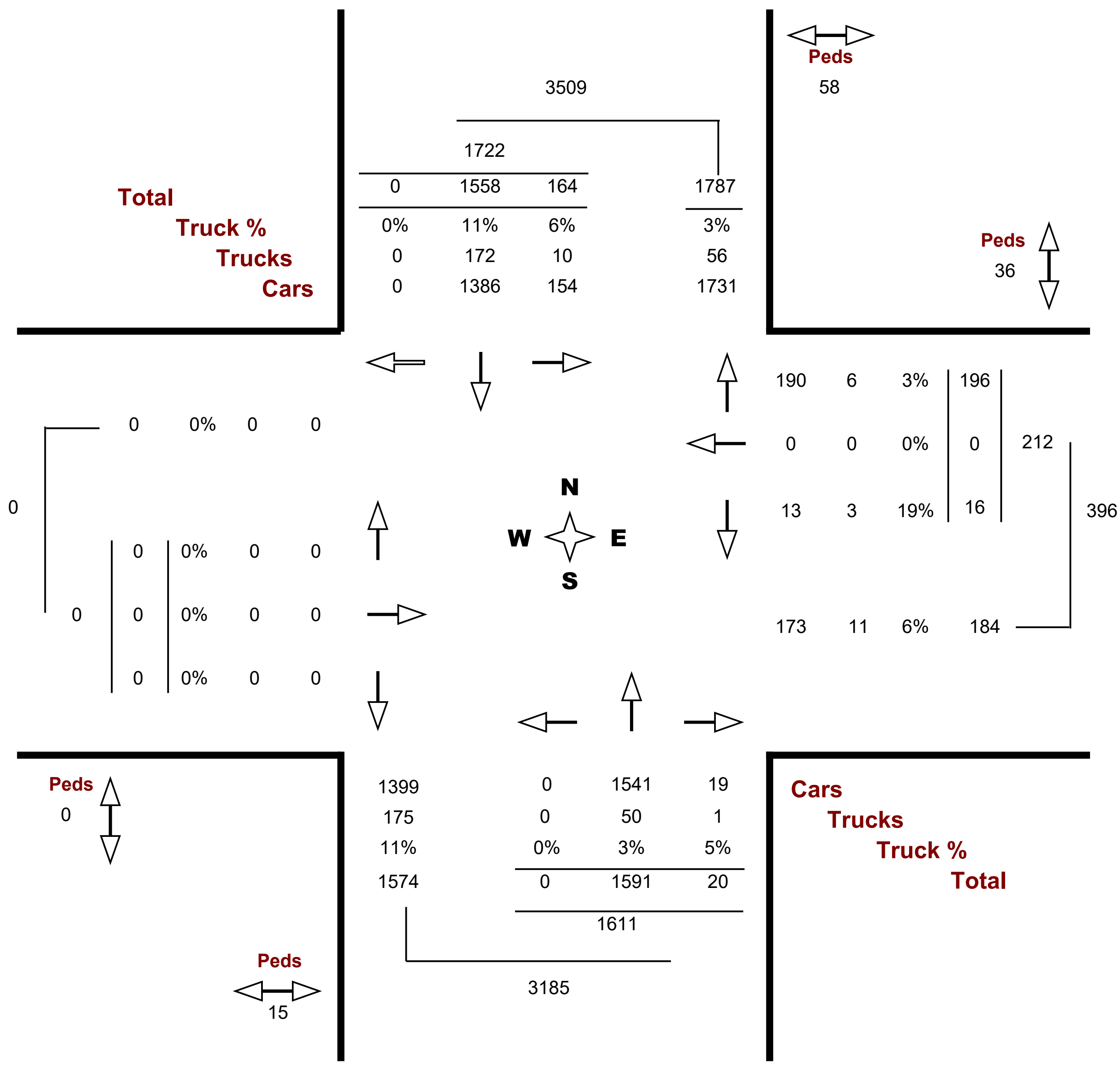
Turning Movements Report - AM Period

Location............. HURONTARIO ST @ JOHN ST

Municipality....... Mississauga **GeoID.......** 349455

Count Date....... Tuesday, 05 May, 2015 **Peak Hour......** 07:30 AM — 08:30 AM

Road 1 JOHN ST **Road 2** HURONTARIO ST



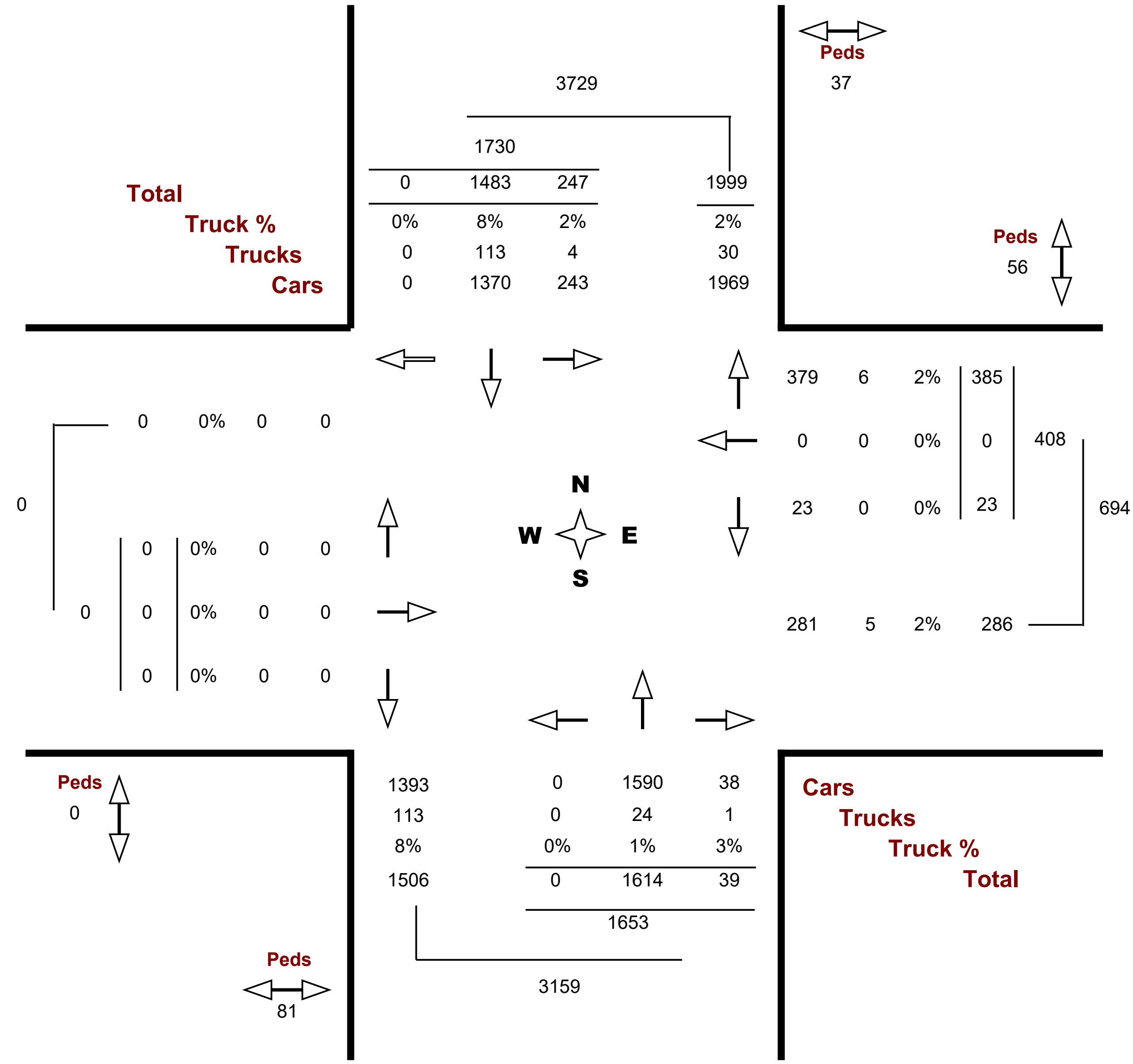
Turning Movements Report - PM Period

Location............. HURONTARIO ST @ JOHN ST

Municipality....... Mississauga **GeoID.......** 349455

Count Date....... Tuesday, 05 May, 2015 **Peak Hour......** 05:00 PM — 06:00 PM

Road 1 JOHN ST **Road 2** HURONTARIO ST



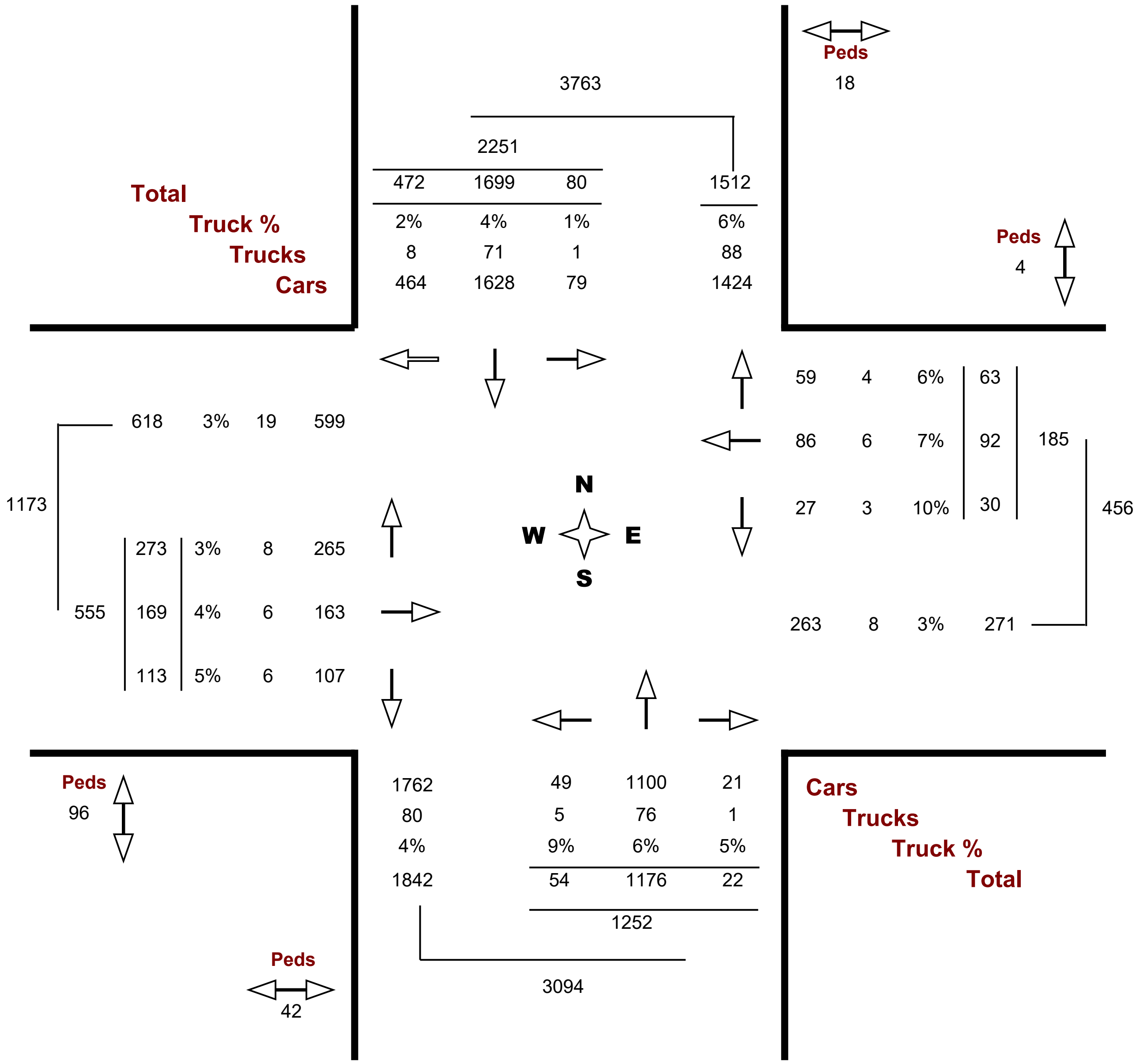
Turning Movements Report - AM Period

Location............. HURONTARIO ST @ KIRWIN AVE / HILLCREST AVE

Municipality....... Mississauga **GeoID.......** 349513

Count Date....... Tuesday, 22 November, 2016 **Peak Hour......** 07:45 AM — 08:45 AM

Road 1 HURONTARIO ST **Road 2** KIRWIN AVE / HILLCREST AVE



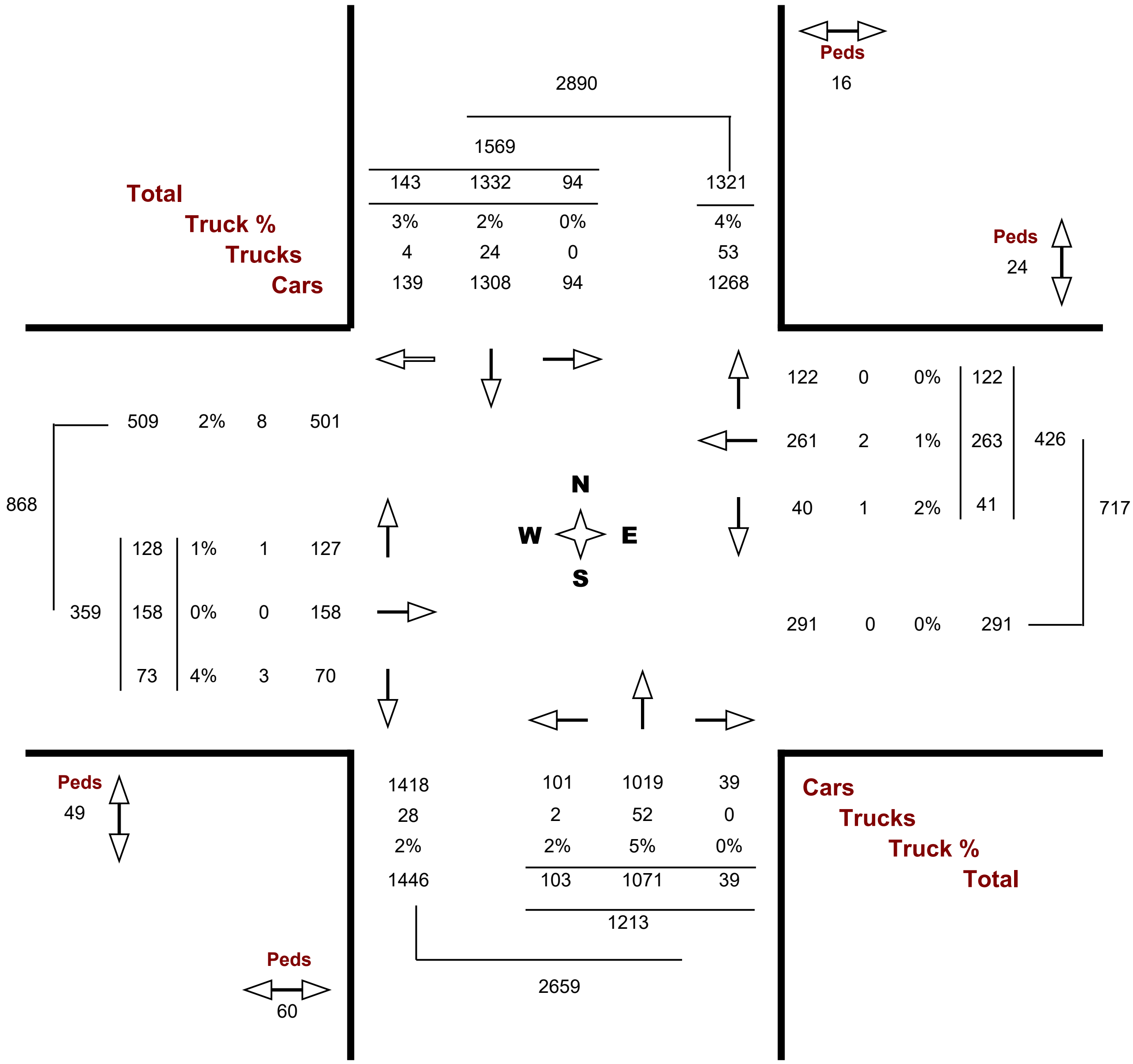
Turning Movements Report - PM Period

Location............. HURONTARIO ST @ KIRWIN AVE / HILLCREST AVE

Municipality....... Mississauga **GeoID.......** 349513

Count Date....... Tuesday, 22 November, 2016 **Peak Hour......** 04:15 PM — 05:15 PM

Road 1 HURONTARIO ST **Road 2** KIRWIN AVE / HILLCREST AVE



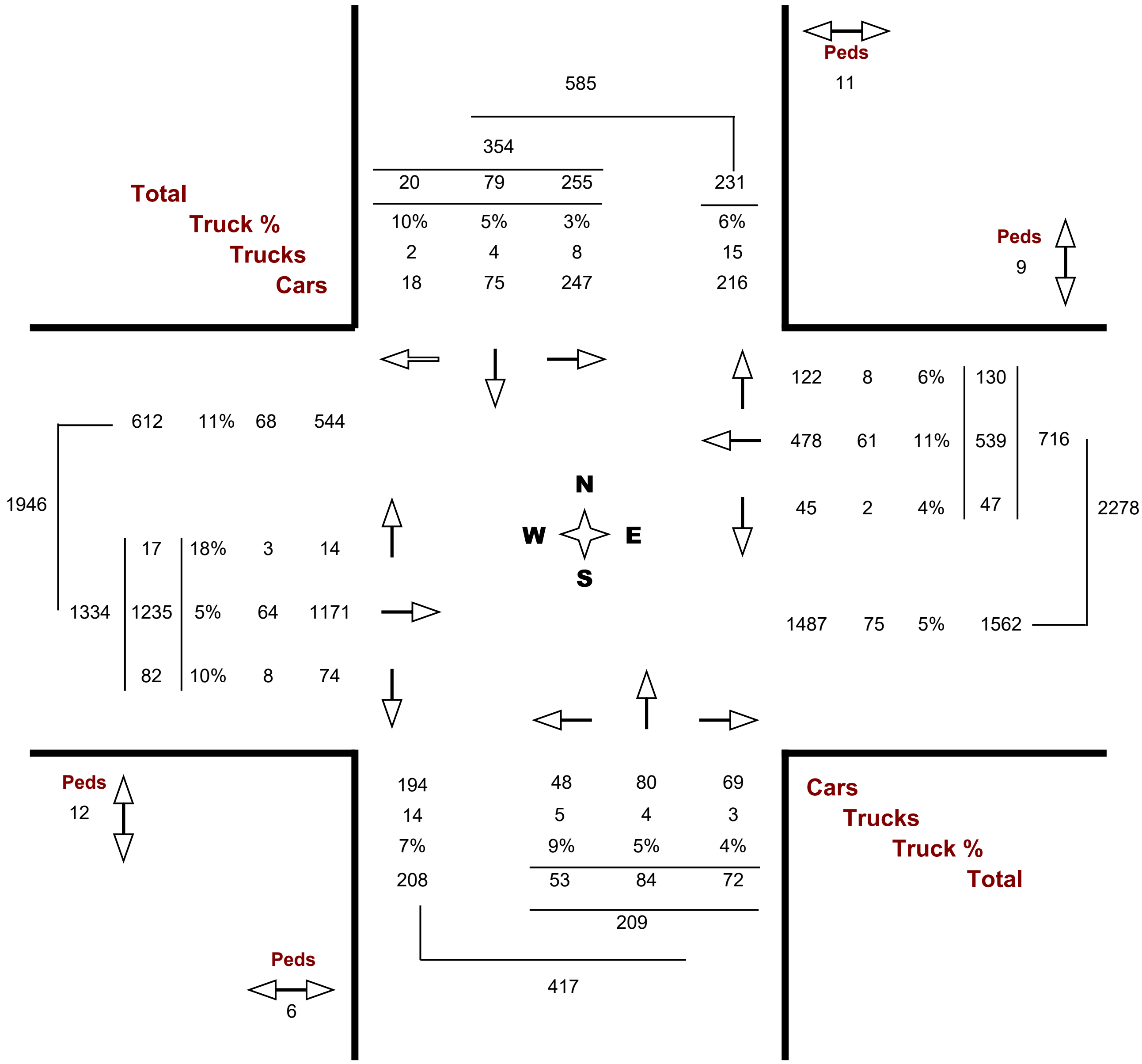
Turning Movements Report - AM Period

Location............. CAMILLA RD @ DUNDAS ST E / KIRWIN AVE

Municipality....... Mississauga **GeoID.......** 349923

Count Date....... Tuesday, 02 December, 2014 **Peak Hour......** 08:00 AM — 09:00 AM

Road 1 CAMILLA RD **Road 2** DUNDAS ST E / KIRWIN AVE



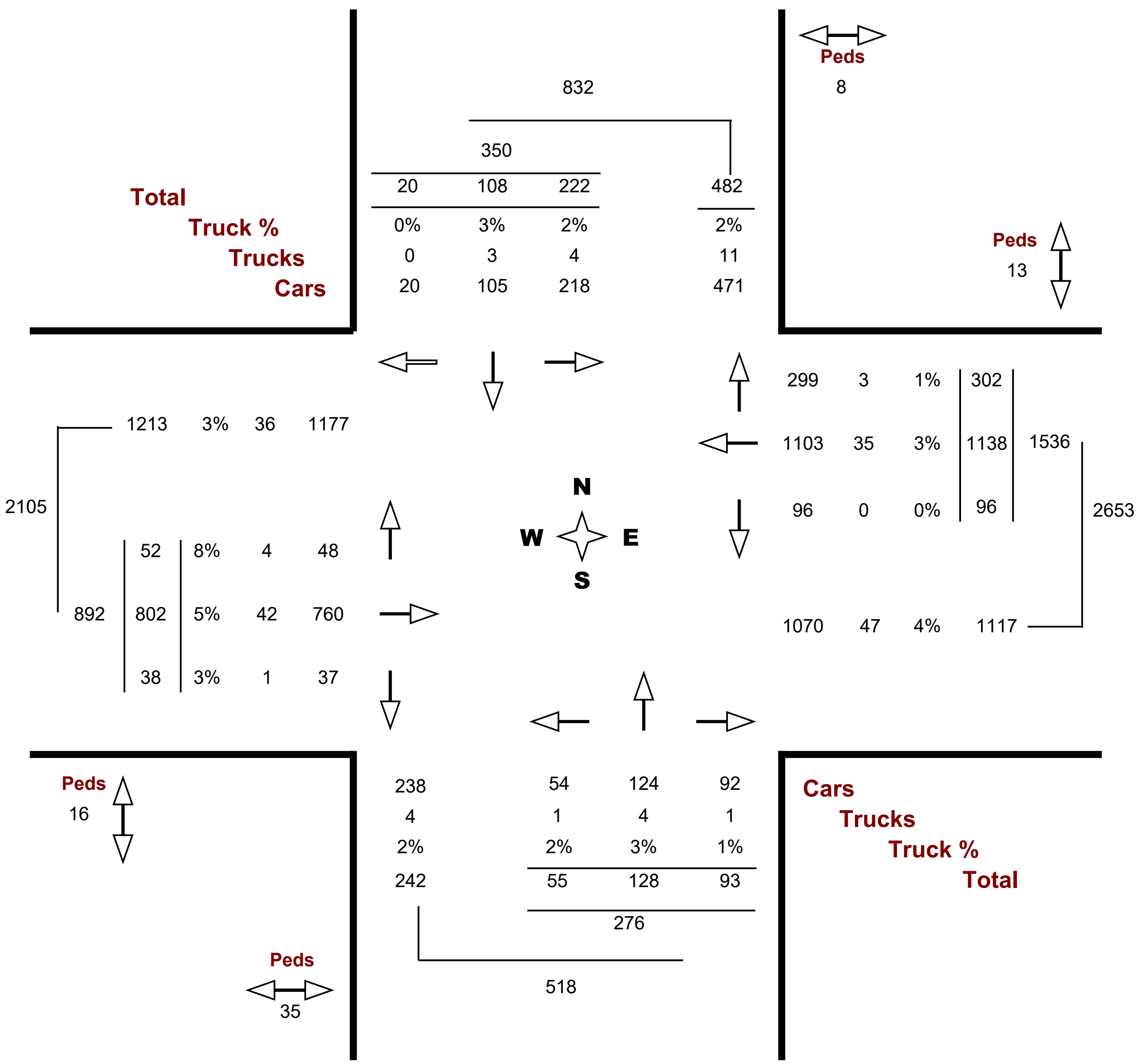
Turning Movements Report - PM Period

Location............. CAMILLA RD @ DUNDAS ST E / KIRWIN AVE

Municipality....... Mississauga **GeoID.......** 349923

Count Date....... Tuesday, 02 December, 2014 **Peak Hour......** 04:30 PM — 05:30 PM

Road 1 CAMILLA RD **Road 2** DUNDAS ST E / KIRWIN AVE



Phase - Parameter 1-16	Units	1	2	3	4	5	6	7	8
Walk	Sec	0	10	0	12	0	10	0	12
Ped Clear	Sec	0	21	0	26	0	21	0	26
Min Green	Sec	5	8	5	8	5	8	0	8
Passage	Sec	2.0	3.0	2.0	3.0	2.0	3.0	0.0	3.0
Maximum 1	Sec	15	30	15	35	15	30	0	35
Maximum 2	Sec	15	30	15	35	15	30	0	35
Yellow Change	Sec	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
Red Clearance	Sec	0.0	3.0	0.0	4.0	0.0	3.0	0.0	4.0
Red Revert	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	Sec	0	0	0	0	0	0	0	0
Time Before Reduction	Sec	0	0	0	0	0	0	0	0
Cars Before Reduction	Veh	0	0	0	0	0	0	0	0
Time To Reduce	Sec	0	0	0	0	0	0	0	0
Reduce By	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dynamic Max Limit	Sec	0	0	0	0	0	0	0	0
Dynamic Max Step	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[P2] Start Up	Enum	phaseNotOn	redClear	phaseNotOn	phaseNotOn	phaseNotOn	redClear	other	phaseNotOn
[P2] Options	Bit	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 3:Non-Actuated 1 7:Max Vehicle Recall 8:Ped. Recall 10:Dual Entry Phase 13:Actuated Rest In Walk	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 5:Non Lock Detector Memory 10:Dual Entry Phase	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 3:Non-Actuated 1 7:Max Vehicle Recall 8:Ped. Recall 10:Dual Entry Phase 13:Actuated Rest In Walk		0:Enabled Phase 5:Non Lock Detector Memory 10:Dual Entry Phase
[P2] Ring	Ring	1	1	1	1	2	2	0	2
[P2] Concurrency	Phase (,)	(5,6)	(5,6)	(8)	(8)	(1,2)	(1,2)	()	(3,4)

Coordination - Pattern 1-16	Units	1	2	3	4	5	6	7	8
Cycle Time	Sec	160	160	160	160	160	0	0	0
Offset	Sec	107	102	115	107	115	0	0	0
Split	Split	1	2	3	4	5	6	7	8
Sequence	Sequence	1	1	1	1	1	1	1	1

Coordination - Pattern 1-16	Units	9	10	11	12	13	14	15
Cycle Time	Sec	0	0	0	0	0	0	0
Offset	Sec	0	0	0	0	0	0	0
Split	Split	9	10	11	12	13	14	15
Sequence	Sequence	1	1	1	1	1	1	1

Coordination - Splits	Units	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 8
Split 1 - Mode	Enum	none	none	none	none	none	none	none
Split 1 - Time	Sec	20	79	15	46	20	79	61
Split 1 - Coord	Enum	False	True	False	False	False	True	False
Split 2 - Mode	Enum	none	none	none	none	none	none	none
Split 2 - Time	Sec	20	79	15	46	20	79	61
Split 2 - Coord	Enum	False	True	False	False	False	True	False
Split 3 - Mode	Enum	none	none	none	none	none	none	none
Split 3 - Time	Sec	20	74	20	46	20	74	66
Split 3 - Coord	Enum	False	True	False	False	False	True	False
Split 4 - Mode	Enum	none	none	none	pedestrianRecall	none	none	pedestrianRecall
Split 4 - Time	Sec	20	79	15	46	20	79	61
Split 4 - Coord	Enum	False	True	False	False	False	True	False
Split 5 - Mode	Enum	none	none	none	pedestrianRecall	none	none	pedestrianRecall
Split 5 - Time	Sec	20	74	20	46	20	74	66
Split 5 - Coord	Enum	False	True	False	False	False	True	False

Generic ASC 2117 HURONTARIO STREET N @ John Street

Time Base - Schedule 1-16	Units	1	2	3	4	5	6	7	8
Month	Bit	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND	J-----------	-F----------	---A--------	----M-------	------J-----
Day of Week	Bit	-MTWTF-	S------	------S	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS
Day of Month	Bit	12345678901234567 89012345678901	12345678901234567 89012345678901	12345678901234567 89012345678901	1----------------------------- -	-------------5------------- -	-2---------------------------- -	---------------------4------ -	1----------------------------- -
Day Plan	Number	1	3	2	3	3	3	3	3

Time Base - Schedule 1-16	Units	9	10	11	12	13	14	15	16
Month	Bit	-------A----	--------S---	---------O--	-----------D	-----------D	-----------D	------------	------------
Day of Week	Bit	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS
Day of Month	Bit	-2-----------------------------	-----6-------------------------	----------1--------------------	------------------------5------	---------------------------8---	-----------------------4-------	-------------------------------	-------------------------------
Day Plan	Number	3	3	3	3	3	3	0	0

Time Base - Day Plans	Units	Evt 1	Evt 2	Evt 3	Evt 4	Evt 5	Evt 6	Evt 7	Evt 8
Plan 1 Hour	Hour	0	6	7	9	9	15	16	18
Plan 1 Minute	Min	0	0	0	0	30	0	30	30
Plan 1 Action	Number	8	1	4	1	2	3	5	3
Plan 2 Hour	Hour	0	7	0	0	0	0	0	0
Plan 2 Minute	Min	0	0	0	0	0	0	0	0
Plan 2 Action	Number	8	2	0	0	0	0	0	0
Plan 3 Hour	Hour	0	8	23	0	0	0	0	0
Plan 3 Minute	Min	0	0	0	0	0	0	0	0
Plan 3 Action	Number	8	2	8	0	0	0	0	0

Time Base - Day Plans	Units	Evt 9
Plan 1 Hour	Hour	19
Plan 1 Minute	Min	30
Plan 1 Action	Number	2

Time Base - Action 1-16	Units	1	2	3	4	5	6	7	8
Pattern	Enum	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Pattern 7	Free
Aux. Functions	Bit								
Spec. Functions	Bit								

Generic ASC 2117 HURONTARIO STREET N @ John Street

Time Base - Action 1-16	Units	9	10
Pattern	Enum	Pattern 9	Pattern 10
Aux. Functions	Bit		
Spec. Functions	Bit		

Location	HURONTARIO STREET N @ John Street
Phase 2	SB
Phase 4	WB
Phase 5	SBLT
Phase 6	NB
Phase 8	EB

Phase - Parameter 1-16	Units	1	2	3	4	5	6	7	8
Walk	Sec	0	14	0	15	0	14	0	15
Ped Clear	Sec	0	30	0	33	0	30	0	33
Min Green	Sec	7	8	5	8	5	8	0	8
Passage	Sec	2.0	3.0	2.0	3.0	2.0	3.0	0.0	3.0
Maximum 1	Sec	15	35	15	25	15	35	0	25
Maximum 2	Sec	15	35	15	25	15	35	0	25
Yellow Change	Sec	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
Red Clearance	Sec	0.0	3.5	0.0	4.0	0.0	3.5	0.0	4.0
Red Revert	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	Sec	0	0	0	0	0	0	0	0
Time Before Reduction	Sec	0	0	0	0	0	0	0	0
Cars Before Reduction	Veh	0	0	0	0	0	0	0	0
Time To Reduce	Sec	0	0	0	0	0	0	0	0
Reduce By	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dynamic Max Limit	Sec	0	0	0	0	0	0	0	0
Dynamic Max Step	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[P2] Start Up	Enum	phaseNotOn	redClear	phaseNotOn	phaseNotOn	phaseNotOn	redClear	other	phaseNotOn
[P2] Options	Bit	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 3:Non-Actuated 1 7:Max Vehicle Recall 8:Ped. Recall 10:Dual Entry Phase 13:Actuated Rest In Walk	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 5:Non Lock Detector Memory 10:Dual Entry Phase	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 3:Non-Actuated 1 7:Max Vehicle Recall 8:Ped. Recall 10:Dual Entry Phase 13:Actuated Rest In Walk	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 5:Non Lock Detector Memory 10:Dual Entry Phase
[P2] Ring	Ring	1	1	1	1	2	2	0	2
[P2] Concurrency	Phase (,)	(5,6)	(5,6)	(8)	(8)	(1,2)	(1,2)	()	(3,4)

Coordination - Pattern 1-16	Units	1	2	3	4	5	6	7	8
Cycle Time	Sec	160	160	160	160	160	0	0	0
Offset	Sec	99	93	107	62	104	0	0	0
Split	Split	1	2	3	4	5	6	7	8
Sequence	Sequence	1	1	1	1	1	1	1	1

Coordination - Splits	Units	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 8
Split 1 - Mode	Enum	none	none	none	none	none	none	none
Split 1 - Time	Sec	13	62	21	64	13	62	85
Split 1 - Coord	Enum	False	True	False	False	False	True	False
Split 2 - Mode	Enum	none	none	none	none	none	none	none
Split 2 - Time	Sec	13	78	13	56	13	78	69
Split 2 - Coord	Enum	False	True	False	False	False	True	False
Split 3 - Mode	Enum	none	none	none	none	none	none	none
Split 3 - Time	Sec	16	54	26	64	16	54	90
Split 3 - Coord	Enum	False	True	False	False	False	True	False
Split 4 - Mode	Enum	none	none	none	pedestrianRecall	none	none	pedestrianRecall
Split 4 - Time	Sec	13	62	21	64	13	62	85
Split 4 - Coord	Enum	False	True	False	False	False	True	False
Split 5 - Mode	Enum	none	none	none	none	none	none	none
Split 5 - Time	Sec	13	78	13	56	13	78	69
Split 5 - Coord	Enum	False	True	False	False	False	True	False

Generic ASC 2115 HURONTARIO STREET N @ Hillcrest Avenue / Kirwin Avenue

Time Base - Schedule 1-16	Units	1	2	3	4	5	6	7	8
Month	Bit	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND	J-----------	-F----------	---A--------	----M-------	------J-----
Day of Week	Bit	-MTWTF-	S------	------S	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS
Day of Month	Bit	1234567890123456789012345678901	1234567890123456789012345678901	1234567890123456789012345678901	1------------------------------	----5--------------------------	-2-----------------------------	------------------------4------	1------------------------------
Day Plan	Number	1	3	2	3	3	3	3	3

Time Base - Schedule 1-16	Units	9	10	11	12	13	14	15	16
Month	Bit	-------A----	--------S---	---------O--	-----------D	-----------D	-----------D	------------	------------
Day of Week	Bit	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS
Day of Month	Bit	-2-----------------------------	-----6-------------------------	----------1--------------------	-----------------------5-------	--------------------------8----	----------------------4--------	-------------------------------	-------------------------------
Day Plan	Number	3	3	3	3	3	3	0	0

Time Base - Day Plans	Units	Evt 1	Evt 2	Evt 3	Evt 4	Evt 5	Evt 6	Evt 7	Evt 8
Plan 1 Hour	Hour	0	6	7	9	9	15	3	16

Plan 1 Minute	Min	0	0	0	0	30	0	0	0
Plan 1 Action	Number	8	1	4	1	2	5	7	3
Plan 2 Hour	Hour	0	7	0	0	0	0	3	0
Plan 2 Minute	Min	0	0	0	0	0	0	0	0
Plan 2 Action	Number	8	2	0	0	0	0	7	0
Plan 3 Hour	Hour	0	8	23	0	0	0	3	0
Plan 3 Minute	Min	0	0	0	0	0	0	0	0
Plan 3 Action	Number	8	2	8	0	0	0	7	0

Time Base - Day Plans	**Units**	**Evt 9**
Plan 1 Hour	Hour	19
Plan 1 Minute	Min	30
Plan 1 Action	Number	2

Time Base - Action 1-16	**Units**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Pattern	Enum	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Free	Free
Aux. Functions	Bit								
Spec. Functions	Bit								

Time Base - Action 1-16	**Units**	**9**	**10**
Pattern	Enum	Pattern 9	Pattern 10
Aux. Functions	Bit		
Spec. Functions	Bit		

Location	HURONTARIO STREET N @ Hillcrest Avenue / Kirwin Avenue
Phase 1	NBLT
Phase 2	SB
Phase 3	EBLT + SBRT
Phase 4	WB
Phase 5	SBLT
Phase 6	NB
Phase 8	EB

Phase - Parameter 1-16	Units	1	2	3	4	5	6	7	8
Walk	Sec	0	10	0	10	0	10	0	10
Ped Clear	Sec	0	27	0	26	0	27	0	26
Min Green	Sec	5	8	5	8	0	8	0	8
Passage	Sec	3.0	3.0	3.0	3.0	0.0	3.0	0.0	3.0
Maximum 1	Sec	10	40	10	30	0	40	0	30
Maximum 2	Sec	10	40	10	30	0	40	0	30
Yellow Change	Sec	3.0	3.5	3.0	3.0	3.0	3.5	3.0	3.0
Red Clearance	Sec	0.0	3.5	0.0	4.0	0.0	3.5	0.0	4.0
Red Revert	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	Sec	0	0	0	0	0	0	0	0
Time Before Reduction	Sec	0	0	0	0	0	0	0	0
Cars Before Reduction	Veh	0	0	0	0	0	0	0	0
Time To Reduce	Sec	0	0	0	0	0	0	0	0
Reduce By	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dynamic Max Limit	Sec	0	0	0	0	0	0	0	0
Dynamic Max Step	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[P2] Start Up	Enum	phaseNotOn	redClear	phaseNotOn	phaseNotOn	other	redClear	other	phaseNotOn
[P2] Options	Bit	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 3:Non-Actuated 1 7:Max Vehicle Recall 8:Ped. Recall 10:Dual Entry Phase 13:Actuated Rest In Walk	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 5:Non Lock Detector Memory 10:Dual Entry Phase		0:Enabled Phase 3:Non-Actuated 1 7:Max Vehicle Recall 8:Ped. Recall 10:Dual Entry Phase 13:Actuated Rest In Walk		0:Enabled Phase 5:Non Lock Detector Memory 10:Dual Entry Phase
[P2] Ring	Ring	1	1	1	1	0	2	0	2
[P2] Concurrency	Phase (,)	(6)	(6)	(8)	(8)	()	(1,2)	()	(3,4)

Coordination - Pattern 1-16	Units	1	2	3	4	5	6	7	8
Cycle Time	Sec	160	160	160	0	0	0	0	0
Offset	Sec	38	155	26	0	0	0	0	0
Split	Split	1	2	3	4	5	6	7	8
Sequence	Sequence	1	1	1	1	1	1	1	1

Coordination - Splits	Units	Phase 1	Phase 2	Phase 3	Phase 4	Phase 6	Phase 8
Split 1 - Mode	Enum	phaseOmitted	none	none	none	none	none
Split 1 - Time	Sec	0	98	17	45	98	62
Split 1 - Coord	Enum	False	True	False	False	True	False
Split 2 - Mode	Enum	none	none	none	none	none	none
Split 2 - Time	Sec	16	75	16	53	91	69
Split 2 - Coord	Enum	False	True	False	False	True	False
Split 3 - Mode	Enum	none	none	none	none	none	none
Split 3 - Time	Sec	17	85	13	45	102	58
Split 3 - Coord	Enum	False	True	False	False	True	False

Time Base - Schedule 1-16	Units	1	2	3	4	5	6	7	8
Month	Bit	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND	J-----------	-F----------	---A--------	----M-------	------J-----
Day of Week	Bit	-MTWTF-	S------	------S	-M-----	-M-----	-----F-	-M-----	-----F-

Time Base - Schedule 1-16	Units	1	2	3	4	5	6	7	8
Day of Month	Bit	1234567890123456789012345678901	1234567890123456789012345678901	1234567890123456789012345678901	--3----------------------------	--------------------1----------	--------------5----------------	----------------------3--------	1------------------------------
Day Plan	Number	1	3	2	3	3	3	3	3

Time Base - Schedule 1-16	Units	9	10	11	12	13	14	15	16
Month	Bit	-------A----	--------S---	---------O--	-----------D	-----------D	-----------D	--------S---	------------
Day of Week	Bit	-M-----	-M-----	-M-----	--T----	-M-----	---W---	-----F-	SMTWTFS
Day of Month	Bit	1------------------------------	----5--------------------------	---------0---------------------	--------------------------7----	-------------------------6-----	---------------------------8---	-----------------------------0-	-------------------------------
Day Plan	Number	3	3	3	3	3	3	3	0

Time Base - Day Plans	Units	Evt 1	Evt 2	Evt 3	Evt 4	Evt 5	Evt 6
Plan 1 Hour	Hour	0	6	9	15	19	3
Plan 1 Minute	Min	0	0	30	0	30	0
Plan 1 Action	Number	8	1	2	3	2	7

Plan 2 Hour	Hour	0	7	3	0	0	0		
Plan 2 Minute	Min	0	0	0	0	0	0		
Plan 2 Action	Number	8	2	7	0	0	0		
Plan 3 Hour	Hour	0	8	23	3	0	0		
Plan 3 Minute	Min	0	0	0	0	0	0		
Plan 3 Action	Number	8	2	8	7	0	0		

Time Base - Action 1-16	**Units**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Pattern	Enum	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Free	Free
Aux. Functions	Bit								
Spec. Functions	Bit								

Time Base - Action 1-16	**Units**	**9**	**10**
Pattern	Enum	Pattern 9	Pattern 10
Aux. Functions	Bit		
Spec. Functions	Bit		

Location	DUNDAS STREET E @ Kirwin Avenue/Camilla Road
Phase 1	WBLT
Phase 2	EB
Phase 3	SBLT
Phase 4	NB
Phase 6	WB
Phase 8	SB

Phase - Parameter 1-16	Units	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
Phase Description*	String								
Walk	Sec	0	10	0	10	0	0	0	0
Ped Clear	Sec	0	15	0	19	0	0	0	0
Min Green	Sec	7	10	0	10	0	0	0	0
Passage	Sec	3.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0
Maximum 1	Sec	25	32	0	45	0	0	0	0
Maximum 2	Sec	25	32	0	45	0	0	0	0
Yellow Change	Sec	3.0	3.5	3.0	3.5	3.0	4.0	3.0	4.0
Red Clearance	Sec	0.0	3.5	0.0	2.0	0.0	0.0	0.0	0.0
Red Revert	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	Sec	0	0	0	0	0	0	0	0
Time Before Reduction	Sec	0	0	0	0	0	0	0	0
Cars Before Reduction	Veh	0	0	0	0	0	0	0	0
Time To Reduce	Sec	0	0	0	0	0	0	0	0
Reduce By	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dynamic Max Limit	Sec	0	0	0	0	0	0	0	0
Dynamic Max Step	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[P2] Start Up	Enum	phaseNotOn	redClear	other	phaseNotOn	other	other	other	other
[P2] Options	Bit	0:Enabled Phase 5:Non Lock Detector Memory	0:Enabled Phase 3:Non-Actuated 1 7:Max Vehicle Recall 8:Ped. Recall 13:Actuated Rest In Walk		0:Enabled Phase 5:Non Lock Detector Memory				
[P2] Ring	Ring	1	1	0	1	0	0	0	0
[P2] Concurrency	Phase (,)	()	()	()	()	()	()	()	()

Coordination - Pattern 1-32	Units	1	2	3	4	5	6	7	8
Cycle Time	Sec	0	0	0	0	0	0	0	0
Offset	Sec	0	0	0	0	0	0	0	0
Split	Split	1	2	3	4	5	6	7	8
Sequence	Sequence	1	1	1	1	1	1	1	1
Phase Parameter Table*	Number	1	1	1	1	1	1	1	1
Coord Phase Reference Point*	Enum	green	green	green	green	green	green	green	green
Coord Mode*	Enum	singlePermissive	singlePermissive	singlePermissive	singlePermissive	singlePermissive	singlePermissive	singlePermissive	singlePermissive

Coordination - Splits	Units	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
Split 1 - Mode	Enum	none	none	none	none	none	none	none	none
Split 1 - Time	Sec	0	0	0	0	0	0	0	0
Split 1 - Coord	Enum	False	True	False	False	False	False	False	False
Split 1 - Coord Phase Options*	Bit		0: Reference Point						
Split 2 - Mode	Enum	none	none	none	none	none	none	none	none
Split 2 - Time	Sec	0	0	0	0	0	0	0	0
Split 2 - Coord	Enum	False	True	False	False	False	False	False	False
Split 2 - Coord Phase Options*	Bit		0: Reference Point						
Split 3 - Mode	Enum	none	none	none	none	none	none	none	none
Split 3 - Time	Sec	0	0	0	0	0	0	0	0
Split 3 - Coord	Enum	False	False	False	False	False	False	False	False
Split 3 - Coord Phase Options*	Bit								
Split 4 - Mode	Enum	none	none	none	none	none	none	none	none
Split 4 - Time	Sec	0	0	0	0	0	0	0	0
Split 4 - Coord	Enum	False	False	False	False	False	False	False	False

Time Base - Schedule 1-16	Units	1	2	3	4	5	6	7	8
Month	Bit	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND	J-----------	-F----------	--M---------	----M-------	------J-----
Day of Week	Bit	-MTWTF-	S------	------S	---W---	-M-----	-----F-	-M-----	-M-----
Day of Month	Bit	1234567890123456789012345678901	1234567890123456789012345678901	1234567890123456789012345678901	1------------------------------	------------------9------------	----------------------------9--	-------------------0-----------	1------------------------------
Day Plan	Number	1	3	2	3	3	3	3	3

Time Base - Schedule 1-16	Units	9	10	11	12	13	14	15	16
Month	Bit	-------A----	--------S---	---------O--	-----------D	-----------D	-----------D	--------S---	------------
Day of Week	Bit	-M-----	-M-----	-M-----	---W---	----T--	--T----	-M-----	SMTWTFS

Day of Month	Bit	----5----------------------- --	-2------------------------- --	------------4------------- --	----------------------5---- --	-----------------------6--- --	---------------------4----- --	--------------------------- 0-	--------------------------- --
Day Plan	Number	3	3	3	3	3	3	3	0

Time Base - Day Plans	**Units**	**Evt 1**	**Evt 2**	**Evt 3**
Plan 1 Hour	Hour	3	19	0
Plan 1 Minute	Min	0	30	0
Plan 1 Action	Number	7	8	0
Plan 2 Hour	Hour	0	0	3
Plan 2 Minute	Min	0	0	0
Plan 2 Action	Number	8	0	7
Plan 3 Hour	Hour	0	0	3
Plan 3 Minute	Min	0	0	0
Plan 3 Action	Number	8	0	7

Time Base - Action 1-32	**Units**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Pattern	Enum	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Free	Free
Aux. Functions	Bit								
Spec. Functions	Bit								

Time Base - Action 1-32	**Units**	**9**	**10**
Pattern	Enum	Pattern 9	Pattern 10
Aux. Functions	Bit		
Spec. Functions	Bit		

Location	HILLCREST AVENUE E @ GO East
Phase 1	EBLT
Phase 2	EW
Phase 4	SB

Volume Result Details by Hour Report

Location............ HURONTARIO ST btwn AGNES ST & UNNAMED UEDU

Municipality....... Mississauga

Count Station..... 2114

Direction........... Both Directions

Date	Time Period		Count	Peak Hour
Thursday, May 19, 2016				
	12:00 AM	01:00 AM	653	☐
	01:00 AM	02:00 AM	389	☐
	02:00 AM	03:00 AM	231	☐
	03:00 AM	04:00 AM	211	☐
	04:00 AM	05:00 AM	216	☐
	05:00 AM	06:00 AM	469	☐
	06:00 AM	07:00 AM	1198	☐
	07:00 AM	08:00 AM	1783	☐
	08:00 AM	09:00 AM	2357	☐
	09:00 AM	10:00 AM	2163	☐
	10:00 AM	11:00 AM	2239	☐
	11:00 AM	12:00 PM	2553	☐
	12:00 PM	01:00 PM	2722	☐
	01:00 PM	02:00 PM	2517	☐
	02:00 PM	03:00 PM	2676	☐
	03:00 PM	04:00 PM	2770	☐
	04:00 PM	05:00 PM	2867	☐
	05:00 PM	06:00 PM	2750	☐
	06:00 PM	07:00 PM	2960	☑
	07:00 PM	08:00 PM	2810	☐
	08:00 PM	09:00 PM	2534	☐
	09:00 PM	10:00 PM	2257	☐
	10:00 PM	11:00 PM	1827	☐
	11:00 PM	12:00 AM	1507	☐
Total			**44,659**	

Volume Result Details by Hour Report

Location............. HURONTARIO ST btwn AGNES ST & UNNAMED UEDU
Municipality....... Mississauga
Count Station..... 2114
Direction............ Both Directions

Date	Time Period		Count	Peak Hour
Wednesday, May 16, 2018				
	12:00 AM	01:00 AM	469	☐
	01:00 AM	02:00 AM	267	☐
	02:00 AM	03:00 AM	190	☐
	03:00 AM	04:00 AM	120	☐
	04:00 AM	05:00 AM	175	☐
	05:00 AM	06:00 AM	458	☐
	06:00 AM	07:00 AM	1086	☐
	07:00 AM	08:00 AM	1689	☐
	08:00 AM	09:00 AM	1999	☐
	09:00 AM	10:00 AM	1970	☐
	10:00 AM	11:00 AM	1954	☐
	11:00 AM	12:00 PM	2166	☐
	12:00 PM	01:00 PM	2267	☐
	01:00 PM	02:00 PM	2150	☐
	02:00 PM	03:00 PM	2320	☑
	03:00 PM	04:00 PM	2214	☐
	04:00 PM	05:00 PM	2196	☐
	05:00 PM	06:00 PM	2257	☐
	06:00 PM	07:00 PM	1997	☐
	07:00 PM	08:00 PM	2240	☐
	08:00 PM	09:00 PM	1962	☐
	09:00 PM	10:00 PM	1930	☐
	10:00 PM	11:00 PM	1297	☐
	11:00 PM	12:00 AM	967	☐
Total			**36,340**	

APPENDIX E:

Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare.
B	> 10 and ≤ 15	VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal.
C	> 15 and ≤ 25	GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable.
D	> 25 and ≤ 35	FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street.
E	> 35 and ≤ 50	POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable.
F	> 50	UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay.
B	> 10 and ≤ 20	VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay.
C	> 20 and ≤ 35	GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B".
D	> 35 and ≤ 55	FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression.
E	> 55 and ≤ 80	POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common.
F	> 80	UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

APPENDIX F:

Detailed Capacity Analysis

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	198	30	7	19	15	1591	90	1558	291
Future Volume (vph)	198	30	7	19	15	1591	90	1558	291
Lane Group Flow (vph)	215	97	8	187	16	1746	98	1693	316
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases		8		4		6	5	2	
Permitted Phases	8		4		6	6	2	2	2
Detector Phase	8	8	4	4	6	6	5	2	2
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	38.0	38.0	9.5	38.0	38.0
Total Split (s)	61.0	61.0	61.0	61.0	79.0	79.0	20.0	99.0	99.0
Total Split (%)	38.1%	38.1%	38.1%	38.1%	49.4%	49.4%	12.5%	61.9%	61.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	2.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes		
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
v/c Ratio	0.92	0.25	0.03	0.37	0.14	0.65	0.51	0.59	0.37
Control Delay	97.7	38.7	38.7	9.7	20.5	25.8	22.3	17.7	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	97.7	38.7	38.7	9.7	20.5	26.2	22.3	17.7	7.6
Queue Length 50th (m)	66.6	20.7	1.9	5.0	2.3	163.0	10.0	106.1	17.6
Queue Length 95th (m)	93.4	33.6	5.9	23.0	m6.3	m211.0	25.0	146.1	43.4
Internal Link Dist (m)		191.8		112.9		109.3		252.0	
Turn Bay Length (m)			25.0		15.0		35.0		40.0
Base Capacity (vph)	302	504	367	601	114	2671	258	2873	844
Starvation Cap Reductn	0	0	0	0	0	400	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.19	0.02	0.31	0.14	0.77	0.38	0.59	0.37

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 107 (67%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	30	59	7	19	153	15	1591	16	90	1558	291
Future Volume (vph)	198	30	59	7	19	153	15	1591	16	90	1558	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		2.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.97		1.00	1.00		1.00	1.00	0.86
Flpb, ped/bikes	0.99	1.00		0.97	1.00		0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1584	1467		1489	1455		1590	4617		1606	4371	1195
Flt Permitted	0.54	1.00		0.69	1.00		0.12	1.00		0.08	1.00	1.00
Satd. Flow (perm)	895	1467		1088	1455		197	4617		137	4371	1195
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	215	33	64	8	21	166	16	1729	17	98	1693	316
RTOR Reduction (vph)	0	10	0	0	123	0	0	0	0	0	0	59
Lane Group Flow (vph)	215	87	0	8	64	0	16	1746	0	98	1693	257
Confl. Peds. (#/hr)	16		24	24		16	81		34	34		81
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	0%	0%	5%	5%	0%	0%	0%	2%	0%	0%	8%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6	6		2	2	2
Actuated Green, G (s)	40.8	40.8		40.8	40.8		91.5	91.5		104.2	104.2	104.2
Effective Green, g (s)	41.8	41.8		41.8	41.8		92.5	92.5		105.2	105.2	105.2
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.58	0.58		0.66	0.66	0.66
Clearance Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	233	383		284	380		113	2669		188	2873	785
v/s Ratio Prot		0.06			0.04			c0.38		0.03	c0.39	
v/s Ratio Perm	c0.24			0.01			0.08			0.31		0.22
v/c Ratio	0.92	0.23		0.03	0.17		0.14	0.65		0.52	0.59	0.33
Uniform Delay, d1	57.5	46.4		44.0	45.7		15.5	22.9		16.4	15.3	12.0
Progression Factor	1.00	1.00		1.00	1.00		0.80	0.98		1.00	1.00	1.00
Incremental Delay, d2	38.3	0.3		0.0	0.2		2.2	1.1		2.6	0.9	1.1
Delay (s)	95.8	46.7		44.0	45.9		14.7	23.4		19.0	16.2	13.1
Level of Service	F	D		D	D		B	C		B	B	B
Approach Delay (s)		80.5			45.8			23.4			15.9	
Approach LOS		F			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		

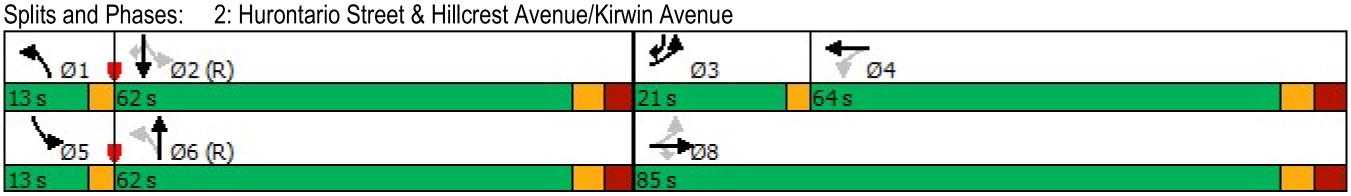
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	273	179	115	30	96	39	1191	80	1715	181
Future Volume (vph)	273	179	115	30	96	39	1191	80	1715	181
Lane Group Flow (vph)	297	195	125	33	172	42	1319	87	1864	197
Turn Type	pm+pt	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	pm+ov
Protected Phases	3	8			4	1	6	5	2	3
Permitted Phases	8		8	4		6	6	2	2	2
Detector Phase	3	8	8	4	4	1	6	5	2	3
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	7.0	8.0	5.0	8.0	5.0
Minimum Split (s)	9.5	56.0	56.0	56.0	56.0	10.0	51.5	9.5	51.5	9.5
Total Split (s)	21.0	85.0	85.0	64.0	64.0	13.0	62.0	13.0	62.0	21.0
Total Split (%)	13.1%	53.1%	53.1%	40.0%	40.0%	8.1%	38.8%	8.1%	38.8%	13.1%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0
All-Red Time (s)	0.0	4.0	4.0	4.0	4.0	0.0	3.5	0.0	3.5	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	7.0	7.0	7.0	7.0	2.0	6.5	2.0	6.5	2.0
Lead/Lag	Lead			Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	None
v/c Ratio	0.98	0.42	0.29	0.24	0.73	0.27	0.51	0.35	0.67	0.19
Control Delay	96.4	50.4	7.8	63.6	74.0	14.4	21.8	12.2	15.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.1	0.0
Total Delay	96.4	50.4	7.8	63.6	74.0	14.4	22.4	12.2	15.2	0.6
Queue Length 50th (m)	82.0	51.7	0.0	9.5	46.3	4.2	87.8	6.7	66.8	0.4
Queue Length 95th (m)	#127.5	70.8	15.1	19.7	69.0	10.1	119.1	11.7	74.5	1.1
Internal Link Dist (m)		206.4			133.2		400.9		109.3	
Turn Bay Length (m)				50.0		60.0		55.0		
Base Capacity (vph)	303	842	684	354	584	181	2598	270	2763	1041
Starvation Cap Reductn	0	0	0	0	0	0	0	0	175	0
Spillback Cap Reductn	0	0	0	0	3	0	801	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.23	0.18	0.09	0.30	0.23	0.73	0.32	0.72	0.19

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 99 (62%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Hurontario Street & Hillcrest Avenue/Kirwin Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	179	115	30	96	63	39	1191	22	80	1715	181
Future Volume (vph)	273	179	115	30	96	63	39	1191	22	80	1715	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	2.0	7.0	7.0	7.0	7.0		2.0	6.5		2.0	6.5	2.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1584	1729	1272	1488	1599		1575	4478		1605	4628	1352
Flt Permitted	0.39	1.00	1.00	0.64	1.00		0.07	1.00		0.15	1.00	1.00
Satd. Flow (perm)	643	1729	1272	995	1599		121	4478		261	4628	1352
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	195	125	33	104	68	42	1295	24	87	1864	197
RTOR Reduction (vph)	0	0	92	0	20	0	0	1	0	0	0	41
Lane Group Flow (vph)	297	195	33	33	152	0	42	1318	0	87	1864	156
Confl. Peds. (#/hr)	16		60	60		16	24		49	49		24
Heavy Vehicles (%)	1%	0%	5%	3%	1%	0%	2%	5%	0%	0%	2%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8			4		1	6		5	2	3
Permitted Phases	8		8	4			6	6		2	2	2
Actuated Green, G (s)	41.7	41.7	41.7	20.7	20.7		97.7	91.8		101.9	93.9	111.9
Effective Green, g (s)	42.7	42.7	42.7	21.7	21.7		99.7	92.8		103.8	94.9	113.9
Actuated g/C Ratio	0.27	0.27	0.27	0.14	0.14		0.62	0.58		0.65	0.59	0.71
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0		3.0	7.5		3.0	7.5	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	283	461	339	134	216		138	2597		244	2744	962
v/s Ratio Prot	c0.12	0.11			c0.10		0.01	0.29		c0.02	c0.40	0.02
v/s Ratio Perm	0.16		0.03	0.03			0.18			0.21		0.10
v/c Ratio	1.05	0.42	0.10	0.25	0.70		0.30	0.51		0.36	0.68	0.16
Uniform Delay, d1	55.6	48.5	44.2	61.8	66.1		15.6	20.0		12.2	22.2	7.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.88	0.59	0.10
Incremental Delay, d2	67.1	0.6	0.1	1.0	10.0		1.3	0.7		0.8	1.2	0.1
Delay (s)	122.6	49.1	44.3	62.8	76.1		16.9	20.7		11.5	14.4	0.8
Level of Service	F	D	D	E	E		B	C		B	B	A
Approach Delay (s)		83.5			73.9			20.6			13.0	
Approach LOS		F			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	105.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	17	973	59	55	597	126	60	88	193	96
Future Volume (vph)	17	973	59	55	597	126	60	88	193	96
Lane Group Flow (vph)	18	1058	64	60	649	137	65	173	210	122
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2			6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	98.0	98.0	98.0	98.0	98.0	98.0	45.0	45.0	17.0	62.0
Total Split (%)	61.3%	61.3%	61.3%	61.3%	61.3%	61.3%	28.1%	28.1%	10.6%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio	0.04	0.48	0.07	0.23	0.29	0.14	0.43	0.74	0.84	0.30
Control Delay	10.2	13.5	3.9	13.5	11.0	1.9	70.6	74.7	78.3	47.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	13.5	3.9	13.5	11.0	1.9	70.6	74.7	78.3	47.8
Queue Length 50th (m)	1.7	78.3	1.5	6.7	40.2	0.0	19.3	46.4	57.0	30.4
Queue Length 95th (m)	5.5	109.6	7.6	16.7	58.4	8.0	33.6	69.3	#82.4	46.1
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	438	2182	907	264	2203	973	275	406	249	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.48	0.07	0.23	0.29	0.14	0.24	0.43	0.84	0.21

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

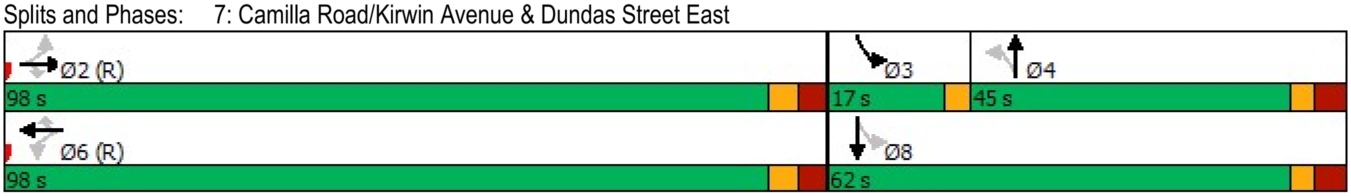
Offset: 38 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East



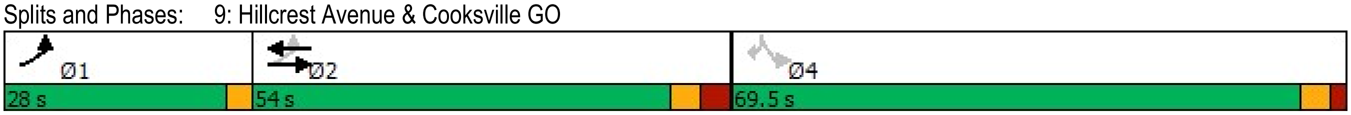
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	973	59	55	597	126	60	88	71	193	96	17
Future Volume (vph)	17	973	59	55	597	126	60	88	71	193	96	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1586	3189	1304	1598	3221	1360	1581	1596		1586	1676	
Flt Permitted	0.38	1.00	1.00	0.23	1.00	1.00	0.68	1.00		0.35	1.00	
Satd. Flow (perm)	640	3189	1304	386	3221	1360	1130	1596		588	1676	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	1058	64	60	649	137	65	96	77	210	104	18
RTOR Reduction (vph)	0	0	15	0	0	43	0	21	0	0	5	0
Lane Group Flow (vph)	18	1058	49	60	649	94	65	152	0	210	117	0
Confl. Peds. (#/hr)	16		13	13		16	14		10	10		14
Heavy Vehicles (%)	0%	3%	5%	0%	2%	0%	0%	0%	0%	1%	0%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	108.5	108.5	108.5	108.5	108.5	108.5	20.5	20.5		37.5	37.5	
Effective Green, g (s)	109.5	109.5	109.5	109.5	109.5	109.5	21.5	21.5		38.5	38.5	
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.68	0.68	0.13	0.13		0.24	0.24	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	438	2182	892	264	2204	930	151	214		235	403	
v/s Ratio Prot		c0.33			0.20			c0.10		c0.08	0.07	
v/s Ratio Perm	0.03		0.04	0.16		0.07	0.06			0.13		
v/c Ratio	0.04	0.48	0.05	0.23	0.29	0.10	0.43	0.71		0.89	0.29	
Uniform Delay, d1	8.2	11.9	8.3	9.4	10.0	8.6	63.6	66.3		55.7	49.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.8	0.1	2.0	0.3	0.2	2.0	10.6		31.8	0.4	
Delay (s)	8.4	12.7	8.4	11.4	10.3	8.8	65.6	76.9		87.5	50.0	
Level of Service	A	B	A	B	B	A	E	E		F	D	
Approach Delay (s)		12.4			10.2			73.8			73.7	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	257	550	298	17	217
Future Volume (vph)	257	550	298	17	217
Lane Group Flow (vph)	0	877	344	18	236
Turn Type	pm+pt	NA	NA	Perm	Perm
Protected Phases	1	2	2		
Permitted Phases	2			4	4
Detector Phase	1	2	2	4	4
Switch Phase					
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	32.0	32.0	34.5	34.5
Total Split (s)	28.0	54.0	54.0	69.5	69.5
Total Split (%)	18.5%	35.6%	35.6%	45.9%	45.9%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.0	3.5	3.5	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	4.5	4.5
Lead/Lag	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	None
v/c Ratio		0.35	0.15	0.09	0.54
Control Delay		4.9	3.9	26.3	9.3
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		4.9	3.9	26.3	9.3
Queue Length 50th (m)		13.8	6.5	2.0	0.0
Queue Length 95th (m)		19.6	10.5	7.1	17.0
Internal Link Dist (m)		132.4	206.4	85.2	
Turn Bay Length (m)					
Base Capacity (vph)		2529	2276	1200	1451
Starvation Cap Reductn		0	0	0	0
Spillback Cap Reductn		0	0	0	0
Storage Cap Reductn		0	0	0	0
Reduced v/c Ratio		0.35	0.15	0.01	0.16

Intersection Summary
Cycle Length: 151.5
Actuated Cycle Length: 69.9
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 9: Hillcrest Avenue & Cooksville GO



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	257	550	298	18	17	217
Future Volume (vph)	257	550	298	18	17	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		4.5	4.5
Lane Util. Factor		0.91	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.98
Flpb, ped/bikes		1.00	1.00		0.98	1.00
Frt		1.00	0.99		1.00	0.85
Flt Protected		0.98	1.00		0.95	1.00
Satd. Flow (prot)		4861	3300		1264	1500
Flt Permitted		0.75	1.00		0.95	1.00
Satd. Flow (perm)		3679	3300		1264	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	279	598	324	20	18	236
RTOR Reduction (vph)	0	0	1	0	0	199
Lane Group Flow (vph)	0	877	343	0	18	37
Confl. Peds. (#/hr)	30			30	23	7
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	5%	6%	10%	0%	42%	7%
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	1	2	2			
Permitted Phases	2				4	4
Actuated Green, G (s)		47.3	47.3		10.1	10.1
Effective Green, g (s)		48.3	48.3		11.1	11.1
Actuated g/C Ratio		0.69	0.69		0.16	0.16
Clearance Time (s)		7.0	7.0		5.5	5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2542	2280		200	238
v/s Ratio Prot			0.10			
v/s Ratio Perm		c0.24			0.01	c0.02
v/c Ratio		0.35	0.15		0.09	0.16
Uniform Delay, d1		4.4	3.7		25.1	25.4
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.1		0.2	0.3
Delay (s)		4.5	3.9		25.3	25.7
Level of Service		A	A		C	C
Approach Delay (s)		4.5	3.9		25.6	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	14.5
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	91	46	3	132	40	3
Future Volume (Veh/h)	91	46	3	132	40	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	50	3	143	43	3
Pedestrians	21			6	30	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	2			1	3	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	137					
pX, platoon unblocked						
vC, conflicting volume			179		324	160
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			179		324	160
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		93	100
cM capacity (veh/h)			1369		625	861

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	149	146	46
Volume Left	0	3	43
Volume Right	50	0	3
cSH	1700	1369	637
Volume to Capacity	0.09	0.00	0.07
Queue Length 95th (m)	0.0	0.1	1.8
Control Delay (s)	0.0	0.2	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	11.1
Approach LOS			B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	148	18	7	127	10	14	15	10	21	23	15
Future Vol, veh/h	13	148	18	7	127	10	14	15	10	21	23	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	29	1	0	0	0	0	0	0	0	0	0	13
Mvmt Flow	14	161	20	8	138	11	15	16	11	23	25	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.1	8.8	8.1	8.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	36%	100%	0%	100%	0%	36%
Vol Thru, %	38%	0%	89%	0%	93%	39%
Vol Right, %	26%	0%	11%	0%	7%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	39	13	166	7	137	59
LT Vol	14	13	0	7	0	21
Through Vol	15	0	148	0	127	23
RT Vol	10	0	18	0	10	15
Lane Flow Rate	42	14	180	8	149	64
Geometry Grp	2	5	5	5	5	2
Degree of Util (X)	0.056	0.023	0.242	0.011	0.201	0.084
Departure Headway (Hd)	4.748	5.884	4.828	5.423	4.87	4.719
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	755	610	745	661	739	760
Service Time	2.773	3.606	2.55	3.146	2.592	2.743
HCM Lane V/C Ratio	0.056	0.023	0.242	0.012	0.202	0.084
HCM Control Delay	8.1	8.7	9.1	8.2	8.8	8.2
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.9	0	0.7	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	15	78	9	15	0	119	0	6	0	0	0
Future Volume (Veh/h)	0	15	78	9	15	0	119	0	6	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	85	10	16	0	129	0	7	0	0	0
Pedestrians		1			1			12				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		354										
pX, platoon unblocked												
vC, conflicting volume	16			113			108	106	72	102	149	17
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			113			108	106	72	102	149	17
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			85	100	99	100	100	100
cM capacity (veh/h)	1602			1472			851	770	984	859	729	1061

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	101	26	136
Volume Left	0	10	129
Volume Right	85	0	7
cSH	1700	1472	857
Volume to Capacity	0.06	0.01	0.16
Queue Length 95th (m)	0.0	0.2	4.3
Control Delay (s)	0.0	2.9	10.0
Lane LOS		A	A
Approach Delay (s)	0.0	2.9	10.0
Approach LOS			A

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	179	108	117	84	16
Future Vol, veh/h	17	179	108	117	84	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	1	1	2	2	0
Mvmt Flow	18	195	117	127	91	17
Number of Lanes	1	1	1	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	2
HCM Control Delay	9.5	8.2	9
HCM LOS	A	A	A

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	84%
Vol Thru, %	0%	100%	100%	0%	0%
Vol Right, %	0%	0%	0%	100%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	179	108	117	100
LT Vol	17	0	0	0	84
Through Vol	0	179	108	0	0
RT Vol	0	0	0	117	16
Lane Flow Rate	18	195	117	127	109
Geometry Grp	5	5	5	5	2
Degree of Util (X)	0.028	0.27	0.163	0.152	0.152
Departure Headway (Hd)	5.489	5.004	4.988	4.302	5.03
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	653	718	720	834	713
Service Time	3.217	2.732	2.714	2.027	3.062
HCM Lane V/C Ratio	0.028	0.272	0.163	0.152	0.153
HCM Control Delay	8.4	9.6	8.7	7.8	9
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	1.1	0.6	0.5	0.5

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	228	37	22	31	25	1614	115	1483	160
Future Volume (vph)	228	37	22	31	25	1614	115	1483	160
Lane Group Flow (vph)	248	78	24	209	27	1780	125	1612	174
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases		8		4		6	5	2	
Permitted Phases	8		4		6	6	2	2	2
Detector Phase	8	8	4	4	6	6	5	2	2
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	38.0	38.0	9.5	38.0	38.0
Total Split (s)	66.0	66.0	66.0	66.0	74.0	74.0	20.0	94.0	94.0
Total Split (%)	41.3%	41.3%	41.3%	41.3%	46.3%	46.3%	12.5%	58.8%	58.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	2.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes		
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
v/c Ratio	0.94	0.16	0.07	0.38	0.28	0.77	0.69	0.63	0.23
Control Delay	94.1	31.8	35.3	9.7	23.2	21.7	48.2	22.7	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	94.1	31.8	35.3	9.7	23.2	21.7	48.2	22.8	8.6
Queue Length 50th (m)	75.4	14.9	5.3	7.5	2.3	180.2	20.6	119.3	11.0
Queue Length 95th (m)	#117.1	26.1	11.8	26.5	m7.0	221.4	44.7	150.2	26.2
Internal Link Dist (m)		191.8		112.9		109.3		252.0	
Turn Bay Length (m)			25.0		15.0		35.0		40.0
Base Capacity (vph)	312	579	430	613	95	2320	224	2557	756
Starvation Cap Reductn	0	0	0	0	0	5	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	111	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.13	0.06	0.34	0.28	0.77	0.56	0.66	0.23

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 115 (72%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

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

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

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	37	35	22	31	161	25	1614	24	115	1483	160
Future Volume (vph)	228	37	35	22	31	161	25	1614	24	115	1483	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		2.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.94		1.00	1.00		1.00	1.00	0.85
Flpb, ped/bikes	0.96	1.00		0.98	1.00		0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1512	1551		1570	1365		1391	4522		1530	4214	1187
Flt Permitted	0.53	1.00		0.71	1.00		0.13	1.00		0.06	1.00	1.00
Satd. Flow (perm)	849	1551		1167	1365		186	4522		101	4214	1187
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	248	40	38	24	34	175	27	1754	26	125	1612	174
RTOR Reduction (vph)	0	8	0	0	120	0	0	1	0	0	0	36
Lane Group Flow (vph)	248	70	0	24	89	0	27	1779	0	125	1612	138
Confl. Peds. (#/hr)	47		20	20		47	90		46	46		90
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	2%	0%	3%	0%	0%	5%	14%	4%	0%	5%	12%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6	6		2	2	2
Actuated Green, G (s)	48.9	48.9		48.9	48.9		81.0	81.0		96.1	96.1	96.1
Effective Green, g (s)	49.9	49.9		49.9	49.9		82.0	82.0		97.1	97.1	97.1
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.51	0.51		0.61	0.61	0.61
Clearance Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	264	483		363	425		95	2317		178	2557	720
v/s Ratio Prot		0.04			0.06			c0.39		c0.06	0.38	
v/s Ratio Perm	c0.29			0.02			0.15			0.37		0.12
v/c Ratio	0.94	0.14		0.07	0.21		0.28	0.77		0.70	0.63	0.19
Uniform Delay, d1	53.6	39.7		38.7	40.5		22.3	31.3		33.3	20.0	14.0
Progression Factor	1.00	1.00		1.00	1.00		0.53	0.57		1.00	1.00	1.00
Incremental Delay, d2	38.8	0.1		0.1	0.2		6.4	2.2		11.8	1.2	0.6
Delay (s)	92.3	39.8		38.8	40.8		18.2	20.1		45.2	21.2	14.6
Level of Service	F	D		D	D		B	C		D	C	B
Approach Delay (s)		79.8			40.6			20.0			22.2	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↱	↰	↑↑↱	↰	↑↑↑	↱
Traffic Volume (vph)	128	183	81	41	278	87	1096	94	1340	28
Future Volume (vph)	128	183	81	41	278	87	1096	94	1340	28
Lane Group Flow (vph)	139	199	88	45	435	95	1233	102	1457	30
Turn Type	pm+pt	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	pm+ov
Protected Phases	3	8			4	1	6	5	2	3
Permitted Phases	8		8	4		6	6	2	2	2
Detector Phase	3	8	8	4	4	1	6	5	2	3
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	7.0	8.0	5.0	8.0	5.0
Minimum Split (s)	9.5	56.0	56.0	56.0	56.0	10.0	51.5	9.5	51.5	9.5
Total Split (s)	13.0	69.0	69.0	56.0	56.0	13.0	78.0	13.0	78.0	13.0
Total Split (%)	8.1%	43.1%	43.1%	35.0%	35.0%	8.1%	48.8%	8.1%	48.8%	8.1%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0
All-Red Time (s)	0.0	4.0	4.0	4.0	4.0	0.0	3.5	0.0	3.5	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	7.0	7.0	7.0	7.0	2.0	6.5	2.0	6.5	2.0
Lead/Lag	Lead			Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	None
v/c Ratio	0.66	0.32	0.16	0.16	0.95	0.57	0.60	0.46	0.70	0.04
Control Delay	46.5	36.6	6.3	42.7	83.0	30.5	33.8	20.5	17.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.0
Total Delay	46.5	36.6	6.3	42.7	83.0	30.5	34.2	20.5	17.3	0.1
Queue Length 50th (m)	28.0	43.9	0.0	10.5	130.2	14.0	108.6	3.8	138.0	0.3
Queue Length 95th (m)	44.1	64.8	11.6	21.3	#194.3	24.1	124.8	m14.8	42.6	m0.0
Internal Link Dist (m)		206.4			133.2		400.9		109.3	
Turn Bay Length (m)				50.0		60.0		55.0		
Base Capacity (vph)	211	644	551	288	477	176	2042	231	2087	735
Starvation Cap Reductn	0	0	0	0	0	0	0	0	194	0
Spillback Cap Reductn	0	0	0	0	0	0	312	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.31	0.16	0.16	0.91	0.54	0.71	0.44	0.77	0.04

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 104 (65%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

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

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

Splits and Phases: 2: Hurontario Street & Hillcrest Avenue/Kirwin Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	183	81	41	278	122	87	1096	39	94	1340	28
Future Volume (vph)	128	183	81	41	278	122	87	1096	39	94	1340	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	2.0	7.0	7.0	7.0	7.0		2.0	6.5		2.0	6.5	2.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	0.99		1.00	1.00		1.00	1.00	0.90
Flpb, ped/bikes	1.00	1.00	1.00	0.97	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1558	1662	1284	1414	1528		1460	4388		1575	4495	1268
Flt Permitted	0.19	1.00	1.00	0.63	1.00		0.10	1.00		0.15	1.00	1.00
Satd. Flow (perm)	310	1662	1284	942	1528		157	4388		251	4495	1268
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	199	88	45	302	133	95	1191	42	102	1457	30
RTOR Reduction (vph)	0	0	55	0	10	0	0	2	0	0	0	14
Lane Group Flow (vph)	139	199	33	45	425	0	95	1231	0	102	1457	16
Confl. Peds. (#/hr)	18		42	42		18	96		4	4		96
Heavy Vehicles (%)	3%	4%	6%	10%	7%	7%	10%	7%	5%	2%	5%	2%
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	8			4		1	6		5	2	3
Permitted Phases	8		8	4			6	6		2	2	2
Actuated Green, G (s)	59.2	59.2	59.2	46.2	46.2		82.4	73.4		82.2	73.3	83.3
Effective Green, g (s)	60.2	60.2	60.2	47.2	47.2		84.4	74.4		84.2	74.3	85.3
Actuated g/C Ratio	0.38	0.38	0.38	0.30	0.30		0.53	0.47		0.53	0.46	0.53
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0		3.0	7.5		3.0	7.5	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	202	625	483	277	450		164	2040		214	2087	676
v/s Ratio Prot	c0.05	0.12			c0.28		c0.04	0.28		0.03	c0.32	0.00
v/s Ratio Perm	0.21		0.03	0.05			0.27			0.22		0.01
v/c Ratio	0.69	0.32	0.07	0.16	0.94		0.58	0.60		0.48	0.70	0.02
Uniform Delay, d1	37.8	35.4	31.9	41.8	55.1		23.4	31.8		21.3	34.0	17.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.90	0.44	0.02
Incremental Delay, d2	9.4	0.3	0.1	0.3	28.7		4.9	1.3		1.3	1.6	0.0
Delay (s)	47.1	35.7	32.0	42.0	83.8		28.3	33.2		20.6	16.6	0.3
Level of Service	D	D	C	D	F		C	C		C	B	A
Approach Delay (s)		38.6			79.9			32.8			16.6	
Approach LOS		D			E			C			B	

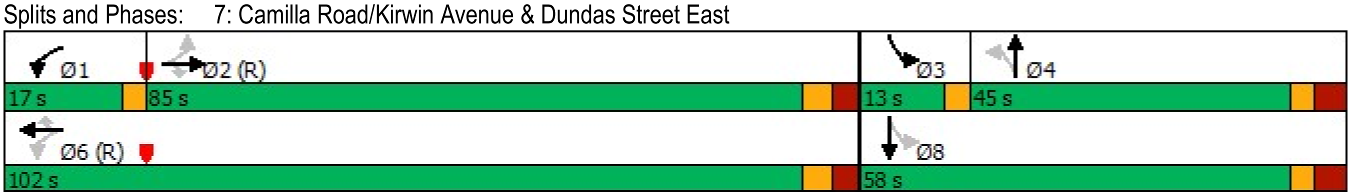
Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	35	730	42	100	996	294	52	124	193	96
Future Volume (vph)	35	730	42	100	996	294	52	124	193	96
Lane Group Flow (vph)	38	793	46	109	1083	320	57	215	210	122
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	1	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	9.5	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	85.0	85.0	85.0	17.0	102.0	102.0	45.0	45.0	13.0	58.0
Total Split (%)	53.1%	53.1%	53.1%	10.6%	63.8%	63.8%	28.1%	28.1%	8.1%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	0.0	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
v/c Ratio	0.17	0.42	0.06	0.26	0.52	0.32	0.31	0.78	0.99	0.30
Control Delay	19.5	18.9	1.6	10.1	14.6	2.4	61.2	76.7	110.9	46.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	18.9	1.6	10.1	14.6	2.4	61.2	76.7	110.9	46.9
Queue Length 50th (m)	5.1	67.6	0.0	10.3	84.4	1.8	16.2	61.1	56.6	30.2
Queue Length 95th (m)	14.3	99.3	3.2	20.4	119.5	14.1	28.8	85.4	#96.3	45.4
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	224	1901	825	455	2100	986	267	398	212	537
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.42	0.06	0.24	0.52	0.32	0.21	0.54	0.99	0.23

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 26 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East



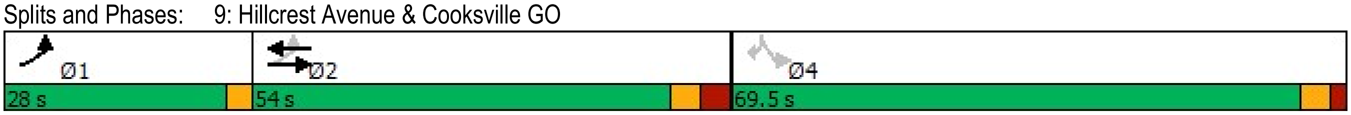
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	730	42	100	996	294	52	124	74	193	96	17
Future Volume (vph)	35	730	42	100	996	294	52	124	74	193	96	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1431	3159	1327	1605	3099	1312	1533	1578		1559	1641	
Flt Permitted	0.25	1.00	1.00	0.30	1.00	1.00	0.68	1.00		0.31	1.00	
Satd. Flow (perm)	374	3159	1327	503	3099	1312	1095	1578		517	1641	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	793	46	109	1083	320	57	135	80	210	104	18
RTOR Reduction (vph)	0	0	18	0	0	97	0	15	0	0	5	0
Lane Group Flow (vph)	38	793	28	109	1083	223	57	200	0	210	117	0
Confl. Peds. (#/hr)	6		5	5		6	15		3	3		15
Heavy Vehicles (%)	12%	4%	5%	0%	6%	6%	3%	1%	6%	3%	3%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	95.4	95.4	95.4	107.5	107.5	107.5	25.5	25.5		38.5	38.5	
Effective Green, g (s)	96.4	96.4	96.4	108.5	108.5	108.5	26.5	26.5		39.5	39.5	
Actuated g/C Ratio	0.60	0.60	0.60	0.68	0.68	0.68	0.17	0.17		0.25	0.25	
Clearance Time (s)	7.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	225	1903	799	410	2101	889	181	261		199	405	
v/s Ratio Prot		0.25		0.02	c0.35			c0.13		c0.07	0.07	
v/s Ratio Perm	0.10		0.02	0.16		0.17	0.05			0.19		
v/c Ratio	0.17	0.42	0.03	0.27	0.52	0.25	0.31	0.77		1.06	0.29	
Uniform Delay, d1	14.1	16.9	12.9	9.8	12.7	10.0	58.8	63.8		58.4	48.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.7	0.1	0.3	0.9	0.7	1.0	12.6		79.1	0.4	
Delay (s)	15.7	17.6	13.0	10.1	13.7	10.7	59.8	76.4		137.5	49.3	
Level of Service	B	B	B	B	B	B	E	E		F	D	
Approach Delay (s)		17.2			12.8			72.9			105.1	
Approach LOS		B			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	136	319	371	73	361
Future Volume (vph)	136	319	371	73	361
Lane Group Flow (vph)	0	495	427	79	392
Turn Type	pm+pt	NA	NA	Perm	Perm
Protected Phases	1	2	2		
Permitted Phases	2			4	4
Detector Phase	1	2	2	4	4
Switch Phase					
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.5	32.0	32.0	34.5	34.5
Total Split (s)	28.0	54.0	54.0	69.5	69.5
Total Split (%)	18.5%	35.6%	35.6%	45.9%	45.9%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.0	3.5	3.5	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	4.5	4.5
Lead/Lag	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	None
v/c Ratio		0.20	0.19	0.38	0.68
Control Delay		4.5	4.4	31.8	9.9
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		4.5	4.4	31.8	9.9
Queue Length 50th (m)		6.8	8.3	9.4	0.0
Queue Length 95th (m)		12.1	15.1	21.0	21.7
Internal Link Dist (m)		132.4	206.4	85.2	
Turn Bay Length (m)					
Base Capacity (vph)		2480	2250	1193	1450
Starvation Cap Reductn		0	0	0	0
Spillback Cap Reductn		0	0	0	0
Storage Cap Reductn		0	0	0	0
Reduced v/c Ratio		0.20	0.19	0.07	0.27

Intersection Summary
Cycle Length: 151.5
Actuated Cycle Length: 70.4
Natural Cycle: 85
Control Type: Semi Act-Uncoord

Splits and Phases: 9: Hillcrest Avenue & Cooksville GO



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	136	319	371	22	73	361
Future Volume (vph)	136	319	371	22	73	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		4.5	4.5
Lane Util. Factor		0.91	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.98
Flpb, ped/bikes		1.00	1.00		0.98	1.00
Frt		1.00	0.99		1.00	0.85
Flt Protected		0.99	1.00		0.95	1.00
Satd. Flow (prot)		4868	3300		1264	1500
Flt Permitted		0.74	1.00		0.95	1.00
Satd. Flow (perm)		3648	3300		1264	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	347	403	24	79	392
RTOR Reduction (vph)	0	0	1	0	0	326
Lane Group Flow (vph)	0	495	426	0	79	66
Confl. Peds. (#/hr)	30			30	23	7
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	5%	6%	10%	0%	42%	7%
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	1	2	2			
Permitted Phases	2				4	4
Actuated Green, G (s)		47.0	47.0		10.8	10.8
Effective Green, g (s)		48.0	48.0		11.8	11.8
Actuated g/C Ratio		0.68	0.68		0.17	0.17
Clearance Time (s)		7.0	7.0		5.5	5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2490	2253		212	251
v/s Ratio Prot			0.13			
v/s Ratio Perm		c0.14			c0.06	0.04
v/c Ratio		0.20	0.19		0.37	0.26
Uniform Delay, d1		4.1	4.1		26.0	25.5
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.0	0.2		1.1	0.6
Delay (s)		4.1	4.2		27.1	26.0
Level of Service		A	A		C	C
Approach Delay (s)		4.1	4.2		26.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	86	48	6	148	53	14
Future Volume (Veh/h)	86	48	6	148	53	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	52	7	161	58	15
Pedestrians	4			2	13	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	137					
pX, platoon unblocked						
vC, conflicting volume			158		311	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			158		311	134
tC, single (s)			4.4		6.5	6.5
tC, 2 stage (s)						
tF (s)			2.5		3.6	3.6
p0 queue free %			99		91	98
cM capacity (veh/h)			1238		645	827

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	145	168	73
Volume Left	0	7	58
Volume Right	52	0	15
cSH	1700	1238	676
Volume to Capacity	0.09	0.01	0.11
Queue Length 95th (m)	0.0	0.1	2.7
Control Delay (s)	0.0	0.4	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	11.0
Approach LOS			B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	143	43	14	268	13	41	32	26	12	22	15
Future Vol, veh/h	28	143	43	14	268	13	41	32	26	12	22	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	39	1	6	0	6	10	0	7	10	0	4	20
Mvmt Flow	30	155	47	15	291	14	45	35	28	13	24	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.8	11.9	9.3	8.8
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	41%	100%	0%	100%	0%	24%
Vol Thru, %	32%	0%	77%	0%	95%	45%
Vol Right, %	26%	0%	23%	0%	5%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	99	28	186	14	281	49
LT Vol	41	28	0	14	0	12
Through Vol	32	0	143	0	268	22
RT Vol	26	0	43	0	13	15
Lane Flow Rate	108	30	202	15	305	53
Geometry Grp	2	5	5	5	5	2
Degree of Util (X)	0.157	0.054	0.285	0.024	0.442	0.078
Departure Headway (Hd)	5.258	6.394	5.076	5.643	5.21	5.291
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	678	558	704	631	687	671
Service Time	3.327	4.161	2.842	3.404	2.971	3.372
HCM Lane V/C Ratio	0.159	0.054	0.287	0.024	0.444	0.079
HCM Control Delay	9.3	9.5	9.9	8.5	12.1	8.8
HCM Lane LOS	A	A	A	A	B	A
HCM 95th-tile Q	0.6	0.2	1.2	0.1	2.3	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	20	73	5	17	0	133	0	12	0	0	0
Future Volume (Veh/h)	0	20	73	5	17	0	133	0	12	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	79	5	18	0	145	0	13	0	0	0
Pedestrians		2			1			11				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		354										
pX, platoon unblocked												
vC, conflicting volume	18			112			102	100	74	104	140	20
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			112			102	100	74	104	140	20
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			83	100	99	100	100	100
cM capacity (veh/h)	1599			1475			861	779	983	855	741	1056

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	101	23	158
Volume Left	0	5	145
Volume Right	79	0	13
cSH	1700	1475	870
Volume to Capacity	0.06	0.00	0.18
Queue Length 95th (m)	0.0	0.1	5.0
Control Delay (s)	0.0	1.6	10.1
Lane LOS		A	B
Approach Delay (s)	0.0	1.6	10.1
Approach LOS			B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	157	292	154	53	15
Future Vol, veh/h	24	157	292	154	53	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	3	9	2	1	0
Mvmt Flow	26	171	317	167	58	16
Number of Lanes	1	1	1	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	2
HCM Control Delay	9.5	10.4	9.1
HCM LOS	A	B	A

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	78%
Vol Thru, %	0%	100%	100%	0%	0%
Vol Right, %	0%	0%	0%	100%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	157	292	154	68
LT Vol	24	0	0	0	53
Through Vol	0	157	292	0	0
RT Vol	0	0	0	154	15
Lane Flow Rate	26	171	317	167	74
Geometry Grp	5	5	5	5	2
Degree of Util (X)	0.041	0.245	0.443	0.195	0.111
Departure Headway (Hd)	5.619	5.167	5.026	4.204	5.386
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	637	695	717	854	664
Service Time	3.353	2.901	2.754	1.931	3.426
HCM Lane V/C Ratio	0.041	0.246	0.442	0.196	0.111
HCM Control Delay	8.6	9.6	11.7	8	9.1
HCM Lane LOS	A	A	B	A	A
HCM 95th-tile Q	0.1	1	2.3	0.7	0.4

Lanes, Volumes, Timings
1: Hurontario Street & Cooksville GO/John Street

2029 FB AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	328	30	7	19	15	1576	97	1305	296
Future Volume (vph)	328	30	7	19	15	1576	97	1305	296
Lane Group Flow (vph)	357	206	8	194	16	1730	105	1418	322
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA	Perm
Protected Phases		8		4	1	6	5	2	
Permitted Phases	8		4			6		2	2
Detector Phase	8	8	4	4	1	6	5	2	2
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	64.0	64.0	64.0	64.0	9.5	81.0	15.0	86.5	86.5
Total Split (%)	40.0%	40.0%	40.0%	40.0%	5.9%	50.6%	9.4%	54.1%	54.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	1.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
v/c Ratio	1.01	0.36	0.02	0.20	0.28	1.17	0.92	0.90	0.46
Control Delay	99.5	23.4	34.0	17.6	78.5	120.5	136.5	42.2	14.7
Queue Delay	0.0	40.7	0.0	0.0	0.0	1.5	0.0	48.9	0.0
Total Delay	99.5	64.1	34.0	17.6	78.5	122.0	136.5	91.1	14.7
Queue Length 50th (m)	~114.9	27.2	1.7	10.6	4.6	~348.7	33.8	195.4	30.6
Queue Length 95th (m)	#182.1	49.6	5.7	20.2	m5.9	m#362.1	#72.2	#278.5	62.2
Internal Link Dist (m)		191.8		112.9		109.3		252.0	
Turn Bay Length (m)			25.0		37.5		48.5		48.5
Base Capacity (vph)	355	565	330	972	57	1478	114	1579	705
Starvation Cap Reductn	0	0	0	0	0	449	0	0	0
Spillback Cap Reductn	0	364	0	0	0	0	0	812	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	1.02	0.02	0.20	0.28	1.68	0.92	1.85	0.46

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

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

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

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

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	328	30	159	7	19	159	15	1576	16	97	1305	296
Future Volume (vph)	328	30	159	7	19	159	15	1576	16	97	1305	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.94		1.00	1.00		1.00	1.00	0.85
Flpb, ped/bikes	0.95	1.00		0.98	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1504	1429		1578	2552		1409	3151		1530	2933	1187
Flt Permitted	0.63	1.00		0.56	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	997	1429		929	2552		1409	3151		1530	2933	1187
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	357	33	173	8	21	173	16	1713	17	105	1418	322
RTOR Reduction (vph)	0	56	0	0	64	0	0	1	0	0	0	69
Lane Group Flow (vph)	357	150	0	8	130	0	16	1729	0	105	1418	253
Confl. Peds. (#/hr)	47		20	20		47	90		46	46		90
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	2%	0%	3%	0%	0%	5%	14%	4%	0%	5%	12%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4				6			2	2
Actuated Green, G (s)	56.0	56.0		56.0	56.0		2.2	74.0		11.0	82.8	82.8
Effective Green, g (s)	57.0	57.0		57.0	57.0		3.2	75.0		12.0	83.8	83.8
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.02	0.47		0.08	0.52	0.52
Clearance Time (s)	8.0	8.0		8.0	8.0		4.0	7.0		4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	355	509		330	909		28	1477		114	1536	621
v/s Ratio Prot		0.10			0.05		0.01	c0.55		c0.07	0.48	
v/s Ratio Perm	c0.36			0.01								0.21
v/c Ratio	1.01	0.29		0.02	0.14		0.57	1.17		0.92	0.92	0.41
Uniform Delay, d1	51.5	37.0		33.4	34.9		77.7	42.5		73.5	35.1	23.1
Progression Factor	1.00	1.00		1.00	1.00		0.98	1.07		1.00	1.00	1.00
Incremental Delay, d2	49.2	0.3		0.0	0.1		10.7	80.1		59.8	10.7	2.0
Delay (s)	100.7	37.4		33.5	35.0		86.9	125.6		133.4	45.9	25.1
Level of Service	F	D		C	D		F	F		F	D	C
Approach Delay (s)		77.5			34.9			125.2			47.2	
Approach LOS		E			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	81.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	122.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	343	189	165	182	109	1157	106	1481
Future Volume (vph)	343	189	165	182	109	1157	106	1481
Lane Group Flow (vph)	373	466	179	349	118	1282	115	1823
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	3	8		4	1	6	5	2
Permitted Phases	8		4			6		2
Detector Phase	3	8	4	4	1	6	5	2
Switch Phase								
Minimum Initial (s)	5.0	8.0	8.0	8.0	7.0	8.0	5.0	8.0
Minimum Split (s)	9.5	56.0	56.0	56.0	11.0	51.5	9.5	51.5
Total Split (s)	11.0	67.0	56.0	56.0	13.0	76.4	16.6	80.0
Total Split (%)	6.9%	41.9%	35.0%	35.0%	8.1%	47.8%	10.4%	50.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	0.0	4.0	4.0	4.0	1.0	3.5	1.0	3.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	7.0	7.0	7.0	3.0	6.5	3.0	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	1.19	0.45	0.91	0.41	0.82	0.89	0.82	1.30
Control Delay	154.0	29.7	100.6	30.3	106.7	49.0	85.5	186.6
Queue Delay	3.1	0.0	0.0	0.0	0.0	49.9	0.0	1.4
Total Delay	157.1	29.7	100.6	30.3	106.7	98.9	85.5	188.0
Queue Length 50th (m)	~110.9	41.8	53.5	29.2	~42.6	206.1	37.6	~384.1
Queue Length 95th (m)	#187.2	56.8	#94.6	43.3	#90.5	#255.5	m#50.0	#425.0
Internal Link Dist (m)		206.4		133.2		400.9		109.3
Turn Bay Length (m)			50.0		53.0		36.0	
Base Capacity (vph)	313	1122	222	955	144	1434	142	1403
Starvation Cap Reductn	0	0	0	0	0	0	0	399
Spillback Cap Reductn	68	0	0	21	0	792	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.52	0.42	0.81	0.37	0.82	2.00	0.81	1.82

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 99 (62%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 150

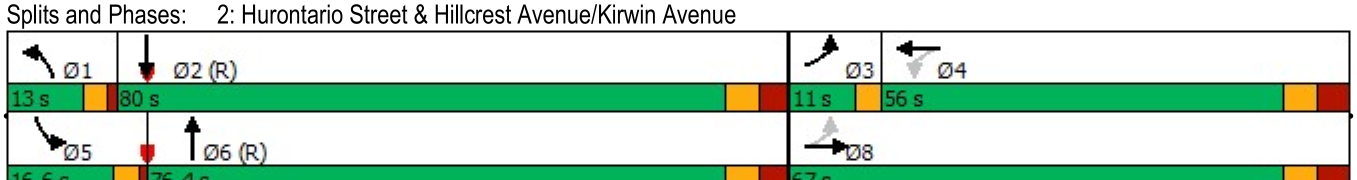
Control Type: Actuated-Coordinated

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

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

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

Splits and Phases: 2: Hurontario Street & Hillcrest Avenue/Kirwin Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	343	189	240	165	182	139	109	1157	22	106	1481	196
Future Volume (vph)	343	189	240	165	182	139	109	1157	22	106	1481	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	2.0	7.0		7.0	7.0		3.0	6.5		3.0	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.94		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1553	2777		1428	2834		1460	3061		1575	3043	
Flt Permitted	0.44	1.00		0.48	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	725	2777		728	2834		1460	3061		1575	3043	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	373	205	261	179	198	151	118	1258	24	115	1610	213
RTOR Reduction (vph)	0	86	0	0	92	0	0	1	0	0	6	0
Lane Group Flow (vph)	373	380	0	179	257	0	118	1281	0	115	1817	0
Confl. Peds. (#/hr)	18		42	42		18	96		4	4		96
Heavy Vehicles (%)	3%	4%	6%	10%	7%	7%	10%	7%	5%	2%	5%	2%
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases	8			4				6			2	
Actuated Green, G (s)	53.2	53.2		42.2	42.2		14.8	74.0		13.3	72.5	
Effective Green, g (s)	54.2	54.2		43.2	43.2		15.8	75.0		14.3	73.5	
Actuated g/C Ratio	0.34	0.34		0.27	0.27		0.10	0.47		0.09	0.46	
Clearance Time (s)	3.0	8.0		8.0	8.0		4.0	7.5		4.0	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	292	940		196	765		144	1434		140	1397	
v/s Ratio Prot	c0.07	0.14			0.09		c0.08	0.42		0.07	c0.60	
v/s Ratio Perm	0.36			c0.25								
v/c Ratio	1.28	0.40		0.91	0.34		0.82	0.89		0.82	1.30	
Uniform Delay, d1	52.2	40.5		56.6	46.9		70.7	38.9		71.6	43.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.77	1.47	
Incremental Delay, d2	148.7	0.3		40.6	0.3		29.1	8.9		23.3	139.0	
Delay (s)	200.9	40.8		97.2	47.1		99.8	47.7		78.4	202.7	
Level of Service	F	D		F	D		F	D		E	F	
Approach Delay (s)		112.0			64.1			52.1			195.3	
Approach LOS		F			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	123.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	124.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	19	1088	59	56	637	137	60	91	255	97
Future Volume (vph)	19	1088	59	56	637	137	60	91	255	97
Lane Group Flow (vph)	21	1183	64	61	692	149	65	179	277	135
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2			6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	98.0	98.0	98.0	98.0	98.0	98.0	45.0	45.0	17.0	62.0
Total Split (%)	61.3%	61.3%	61.3%	61.3%	61.3%	61.3%	28.1%	28.1%	10.6%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio	0.06	0.55	0.07	0.28	0.33	0.16	0.43	0.75	1.11	0.33
Control Delay	10.8	15.3	4.1	15.9	11.8	1.9	69.7	75.2	138.8	46.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	15.3	4.1	15.9	11.8	1.9	69.7	75.2	138.8	46.5
Queue Length 50th (m)	2.1	95.8	1.6	7.2	45.1	0.0	19.2	48.3	~89.3	32.8
Queue Length 95th (m)	6.4	133.5	7.8	19.0	65.5	8.6	33.4	71.4	#139.1	49.3
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	369	2140	914	219	2099	936	263	396	249	574
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.55	0.07	0.28	0.33	0.16	0.25	0.45	1.11	0.24

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 38 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

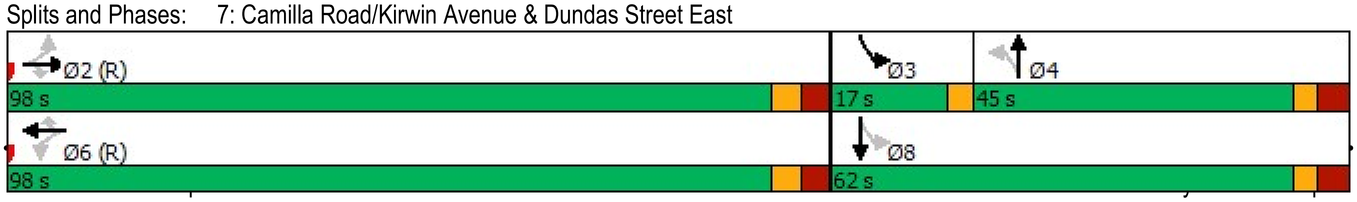
Natural Cycle: 100

Control Type: Actuated-Coordinated

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

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

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East



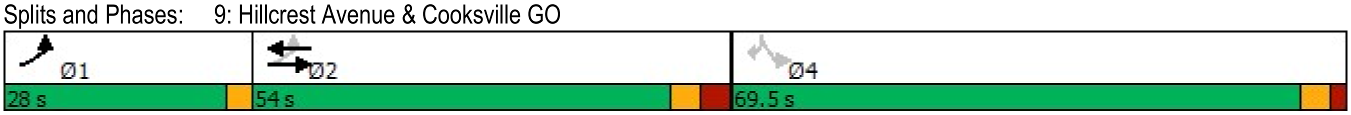
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1088	59	56	637	137	60	91	74	255	97	28
Future Volume (vph)	19	1088	59	56	637	137	60	91	74	255	97	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1428	3159	1327	1604	3099	1312	1534	1551		1558	1622	
Flt Permitted	0.36	1.00	1.00	0.19	1.00	1.00	0.67	1.00		0.35	1.00	
Satd. Flow (perm)	546	3159	1327	324	3099	1312	1083	1551		577	1622	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1183	64	61	692	149	65	99	80	277	105	30
RTOR Reduction (vph)	0	0	15	0	0	48	0	21	0	0	8	0
Lane Group Flow (vph)	21	1183	49	61	692	101	65	158	0	277	127	0
Confl. Peds. (#/hr)	6		5	5		6	15		3	3		15
Heavy Vehicles (%)	12%	4%	5%	0%	6%	6%	3%	1%	6%	3%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	107.4	107.4	107.4	107.4	107.4	107.4	21.6	21.6		38.6	38.6	
Effective Green, g (s)	108.4	108.4	108.4	108.4	108.4	108.4	22.6	22.6		39.6	39.6	
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.68	0.68	0.14	0.14		0.25	0.25	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	369	2140	899	219	2099	888	152	219		234	401	
v/s Ratio Prot		c0.37			0.22			c0.10		c0.11	0.08	
v/s Ratio Perm	0.04		0.04	0.19		0.08	0.06			0.18		
v/c Ratio	0.06	0.55	0.05	0.28	0.33	0.11	0.43	0.72		1.18	0.32	
Uniform Delay, d1	8.7	13.3	8.6	10.3	10.7	9.0	62.8	65.7		57.4	49.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.0	0.1	3.1	0.4	0.3	1.9	11.2		117.6	0.5	
Delay (s)	8.9	14.3	8.8	13.4	11.1	9.3	64.7	76.9		175.0	49.6	
Level of Service	A	B	A	B	B	A	E	E		F	D	
Approach Delay (s)		14.0			11.0			73.7			133.9	
Approach LOS		B			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	257	559	314	17	217
Future Volume (vph)	257	559	314	17	217
Lane Group Flow (vph)	0	887	361	18	236
Turn Type	pm+pt	NA	NA	Perm	Perm
Protected Phases	1	2	2		
Permitted Phases	2			4	4
Detector Phase	1	2	2	4	4
Switch Phase					
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	32.0	32.0	34.5	34.5
Total Split (s)	28.0	54.0	54.0	69.5	69.5
Total Split (%)	18.5%	35.6%	35.6%	45.9%	45.9%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.0	3.5	3.5	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	4.5	4.5
Lead/Lag	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	None
v/c Ratio		0.35	0.16	0.09	0.54
Control Delay		4.9	3.9	26.3	9.3
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		4.9	3.9	26.3	9.3
Queue Length 50th (m)		14.1	6.9	2.0	0.0
Queue Length 95th (m)		20.0	11.1	7.1	17.0
Internal Link Dist (m)		132.4	206.4	85.2	
Turn Bay Length (m)					
Base Capacity (vph)		2520	2278	1200	1451
Starvation Cap Reductn		0	0	0	0
Spillback Cap Reductn		0	0	0	0
Storage Cap Reductn		0	0	0	0
Reduced v/c Ratio		0.35	0.16	0.01	0.16

Intersection Summary
Cycle Length: 151.5
Actuated Cycle Length: 69.9
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 9: Hillcrest Avenue & Cooksville GO



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	257	559	314	18	17	217
Future Volume (vph)	257	559	314	18	17	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		4.5	4.5
Lane Util. Factor		0.91	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.98
Flpb, ped/bikes		1.00	1.00		0.98	1.00
Frt		1.00	0.99		1.00	0.85
Flt Protected		0.98	1.00		0.95	1.00
Satd. Flow (prot)		4862	3301		1264	1500
Flt Permitted		0.74	1.00		0.95	1.00
Satd. Flow (perm)		3666	3301		1264	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	279	608	341	20	18	236
RTOR Reduction (vph)	0	0	1	0	0	199
Lane Group Flow (vph)	0	887	360	0	18	37
Confl. Peds. (#/hr)	30			30	23	7
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	5%	6%	10%	0%	42%	7%
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	1	2	2			
Permitted Phases	2				4	4
Actuated Green, G (s)		47.3	47.3		10.1	10.1
Effective Green, g (s)		48.3	48.3		11.1	11.1
Actuated g/C Ratio		0.69	0.69		0.16	0.16
Clearance Time (s)		7.0	7.0		5.5	5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2533	2280		200	238
v/s Ratio Prot			0.11			
v/s Ratio Perm		c0.24			0.01	c0.02
v/c Ratio		0.35	0.16		0.09	0.16
Uniform Delay, d1		4.4	3.7		25.1	25.4
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.1		0.2	0.3
Delay (s)		4.5	3.9		25.3	25.7
Level of Service		A	A		C	C
Approach Delay (s)		4.5	3.9		25.6	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	14.5
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	91	53	3	132	46	3
Future Volume (Veh/h)	91	53	3	132	46	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	58	3	143	50	3
Pedestrians	4			2	13	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	137					
pX, platoon unblocked						
vC, conflicting volume			170		294	143
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			170		294	143
tC, single (s)			4.4		6.5	6.5
tC, 2 stage (s)						
tF (s)			2.5		3.6	3.6
p0 queue free %			100		92	100
cM capacity (veh/h)			1225		662	817

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	157	146	53
Volume Left	0	3	50
Volume Right	58	0	3
cSH	1700	1225	669
Volume to Capacity	0.09	0.00	0.08
Queue Length 95th (m)	0.0	0.1	2.0
Control Delay (s)	0.0	0.2	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.8
Approach LOS			B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	194	18	7	150	10	14	21	10	21	30	15
Future Vol, veh/h	13	194	18	7	150	10	14	21	10	21	30	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	39	1	6	0	6	10	0	7	10	0	4	20
Mvmt Flow	14	211	20	8	163	11	15	23	11	23	33	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.8	9.4	8.4	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	31%	100%	0%	100%	0%	32%
Vol Thru, %	47%	0%	92%	0%	94%	45%
Vol Right, %	22%	0%	8%	0%	6%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	13	212	7	160	66
LT Vol	14	13	0	7	0	21
Through Vol	21	0	194	0	150	30
RT Vol	10	0	18	0	10	15
Lane Flow Rate	49	14	230	8	174	72
Geometry Grp	2	5	5	5	5	2
Degree of Util (X)	0.068	0.024	0.315	0.012	0.245	0.098
Departure Headway (Hd)	4.969	6.128	4.917	5.515	5.071	4.933
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	719	584	730	649	708	725
Service Time	3.012	3.862	2.65	3.251	2.807	2.975
HCM Lane V/C Ratio	0.068	0.024	0.315	0.012	0.246	0.099
HCM Control Delay	8.4	9	9.9	8.3	9.5	8.5
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	1.4	0	1	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	15	78	9	15	0	119	0	6	0	0	0
Future Volume (Veh/h)	0	15	78	9	15	0	119	0	6	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	85	10	16	0	129	0	7	0	0	0
Pedestrians		2			1			11				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		354										
pX, platoon unblocked												
vC, conflicting volume	16			112			108	106	70	102	148	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			112			108	106	70	102	148	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			85	100	99	100	100	100
cM capacity (veh/h)	1602			1475			852	771	987	860	731	1059

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	101	26	136
Volume Left	0	10	129
Volume Right	85	0	7
cSH	1700	1475	858
Volume to Capacity	0.06	0.01	0.16
Queue Length 95th (m)	0.0	0.2	4.3
Control Delay (s)	0.0	2.9	10.0
Lane LOS		A	A
Approach Delay (s)	0.0	2.9	10.0
Approach LOS			A

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	225	131	117	84	16
Future Vol, veh/h	17	225	131	117	84	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	3	9	2	1	0
Mvmt Flow	18	245	142	127	91	17
Number of Lanes	1	1	1	1	1	0

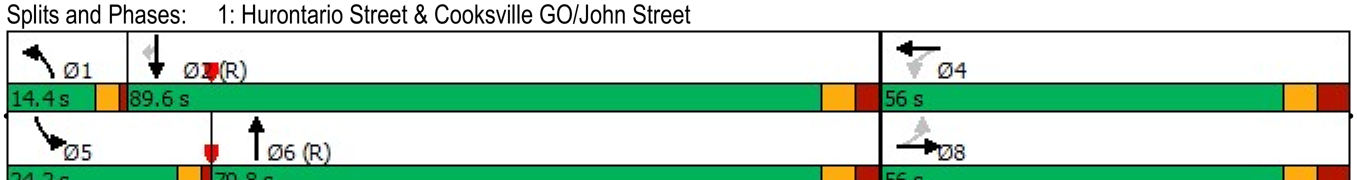
Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	2
HCM Control Delay	10.4	8.6	9.2
HCM LOS	B	A	A

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	84%
Vol Thru, %	0%	100%	100%	0%	0%
Vol Right, %	0%	0%	0%	100%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	225	131	117	100
LT Vol	17	0	0	0	84
Through Vol	0	225	131	0	0
RT Vol	0	0	0	117	16
Lane Flow Rate	18	245	142	127	109
Geometry Grp	5	5	5	5	2
Degree of Util (X)	0.028	0.345	0.205	0.154	0.157
Departure Headway (Hd)	5.524	5.073	5.177	4.353	5.192
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	648	709	693	823	689
Service Time	3.259	2.808	2.911	2.087	3.234
HCM Lane V/C Ratio	0.028	0.346	0.205	0.154	0.158
HCM Control Delay	8.4	10.5	9.2	7.9	9.2
HCM Lane LOS	A	B	A	A	A
HCM 95th-tile Q	0.1	1.5	0.8	0.5	0.6

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	288	37	22	31	40	1427	125	242	235
Future Volume (vph)	288	37	22	31	40	1427	125	242	235
Lane Group Flow (vph)	313	122	24	216	43	1577	136	263	255
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA	Perm
Protected Phases		8		4	1	6	5	2	
Permitted Phases	8		4			6		2	2
Detector Phase	8	8	4	4	1	6	5	2	2
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	56.0	56.0	56.0	56.0	14.4	79.8	24.2	89.6	89.6
Total Split (%)	35.0%	35.0%	35.0%	35.0%	9.0%	49.9%	15.1%	56.0%	56.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	1.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
v/c Ratio	1.01	0.25	0.08	0.22	0.43	1.02	0.76	0.16	0.33
Control Delay	106.7	20.8	40.5	8.9	86.0	67.1	93.8	19.2	3.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	31.2	0.0	0.0	0.0
Total Delay	106.7	20.9	40.5	8.9	86.0	98.3	93.8	19.2	3.3
Queue Length 50th (m)	~100.8	12.9	5.5	4.0	13.1	~280.2	42.3	22.2	0.0
Queue Length 95th (m)	#164.8	29.8	13.1	14.1	m26.8	#330.6	65.5	31.0	14.0
Internal Link Dist (m)		191.8		112.9		109.3		252.0	
Turn Bay Length (m)			25.0		37.5		48.5		48.5
Base Capacity (vph)	311	493	319	981	114	1545	212	1655	766
Starvation Cap Reductn	0	0	0	0	0	314	0	0	0
Spillback Cap Reductn	0	27	19	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.26	0.08	0.22	0.38	1.28	0.64	0.16	0.33

Intersection Summary
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 115 (72%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	37	75	22	31	167	40	1427	24	125	242	235
Future Volume (vph)	288	37	75	22	31	167	40	1427	24	125	242	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.97		1.00	1.00		1.00	1.00	0.86
Flpb, ped/bikes	0.99	1.00		0.97	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1462		1491	2791		1606	3208		1606	3042	1195
Flt Permitted	0.61	1.00		0.66	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1017	1462		1042	2791		1606	3208		1606	3042	1195
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	40	82	24	34	182	43	1551	26	136	263	255
RTOR Reduction (vph)	0	46	0	0	126	0	0	1	0	0	0	117
Lane Group Flow (vph)	313	76	0	24	90	0	43	1576	0	136	263	138
Confl. Peds. (#/hr)	16		24	24		16	81		34	34		81
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	0%	0%	5%	5%	0%	0%	0%	2%	0%	0%	8%	4%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4				6			2	2
Actuated Green, G (s)	48.0	48.0		48.0	48.0		7.7	76.0		17.0	85.3	85.3
Effective Green, g (s)	49.0	49.0		49.0	49.0		8.7	77.0		18.0	86.3	86.3
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.05	0.48		0.11	0.54	0.54
Clearance Time (s)	8.0	8.0		8.0	8.0		4.0	7.0		4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	311	447		319	854		87	1543		180	1640	644
v/s Ratio Prot		0.05			0.03		0.03	c0.49		c0.08	0.09	
v/s Ratio Perm	c0.31			0.02								0.12
v/c Ratio	1.01	0.17		0.08	0.11		0.49	1.02		0.76	0.16	0.21
Uniform Delay, d1	55.5	40.6		39.4	39.8		73.5	41.5		68.9	18.6	19.2
Progression Factor	1.00	1.00		1.00	1.00		1.01	0.96		1.00	1.00	1.00
Incremental Delay, d2	52.7	0.2		0.1	0.1		4.4	28.5		16.4	0.2	0.8
Delay (s)	108.2	40.8		39.5	39.8		78.3	68.2		85.3	18.8	19.9
Level of Service	F	D		D	D		E	E		F	B	B
Approach Delay (s)		89.3			39.8			68.5			33.1	
Approach LOS		F			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	61.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	128	252	86	317	197	116	223	133
Future Volume (vph)	128	252	86	317	197	116	223	133
Lane Group Flow (vph)	139	395	93	502	214	168	242	224
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	3	8		4	1	6	5	2
Permitted Phases	8		4			6		2
Detector Phase	3	8	4	4	1	6	5	2
Switch Phase								
Minimum Initial (s)	5.0	8.0	8.0	8.0	7.0	8.0	5.0	8.0
Minimum Split (s)	9.5	56.0	56.0	56.0	11.0	51.5	9.5	51.5
Total Split (s)	13.0	69.0	56.0	56.0	37.0	53.0	38.0	54.0
Total Split (%)	8.1%	43.1%	35.0%	35.0%	23.1%	33.1%	23.8%	33.8%
Yellow Time (s)	3.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	0.0	4.0	4.0	4.0	1.0	3.5	1.0	3.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	7.0	7.0	7.0	3.0	6.5	3.0	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.71	0.46	0.59	0.79	0.80	0.13	0.82	0.16
Control Delay	62.1	42.7	73.3	64.9	84.3	24.9	91.1	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.7	0.8	0.0
Total Delay	62.1	42.7	73.3	64.9	84.3	25.7	91.9	17.0
Queue Length 50th (m)	33.9	48.2	27.4	74.0	66.2	13.5	79.3	11.8
Queue Length 95th (m)	49.3	60.1	45.2	89.3	90.4	25.6	107.1	20.4
Internal Link Dist (m)		206.4		133.2		400.9		109.3
Turn Bay Length (m)			50.0		53.0		36.0	
Base Capacity (vph)	196	1201	252	977	338	1314	358	1392
Starvation Cap Reductn	0	0	0	0	0	0	19	0
Spillback Cap Reductn	0	0	0	7	0	881	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.33	0.37	0.52	0.63	0.39	0.71	0.16

Intersection Summary
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 104 (65%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 2: Hurontario Street & Hillcrest Avenue/Kirwin Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	252	111	86	317	144	197	116	39	223	133	73
Future Volume (vph)	128	252	111	86	317	144	197	116	39	223	133	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	2.0	7.0		7.0	7.0		3.0	6.5		3.0	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.97	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.95		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1589	3020		1506	3083		1575	2966		1606	2999	
Flt Permitted	0.22	1.00		0.52	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	371	3020		822	3083		1575	2966		1606	2999	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	274	121	93	345	157	214	126	42	242	145	79
RTOR Reduction (vph)	0	37	0	0	39	0	0	16	0	0	36	0
Lane Group Flow (vph)	139	358	0	93	463	0	214	152	0	242	188	0
Confl. Peds. (#/hr)	16		60	60		16	24		49	49		24
Heavy Vehicles (%)	1%	0%	5%	3%	1%	0%	2%	5%	0%	0%	2%	3%
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases	8			4				6			2	
Actuated Green, G (s)	42.8	42.8		29.8	29.8		26.3	69.1		28.6	71.4	
Effective Green, g (s)	43.8	43.8		30.8	30.8		27.3	70.1		29.6	72.4	
Actuated g/C Ratio	0.27	0.27		0.19	0.19		0.17	0.44		0.19	0.45	
Clearance Time (s)	3.0	8.0		8.0	8.0		4.0	7.5		4.0	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	826		158	593		268	1299		297	1357	
v/s Ratio Prot	c0.05	0.12			c0.15		0.14	0.05		c0.15	c0.06	
v/s Ratio Perm	0.15			0.11								
v/c Ratio	0.75	0.43		0.59	0.78		0.80	0.12		0.81	0.14	
Uniform Delay, d1	47.6	47.9		58.8	61.4		63.7	26.6		62.6	25.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.13	0.82	
Incremental Delay, d2	15.7	0.4		5.5	6.6		15.2	0.2		15.6	0.2	
Delay (s)	63.3	48.2		64.3	68.0		78.9	26.8		86.2	21.3	
Level of Service	E	D		E	E		E	C		F	C	
Approach Delay (s)		52.2			67.4			56.0			55.0	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	58.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	40	788	42	103	1119	321	52	126	222	99
Future Volume (vph)	40	788	42	103	1119	321	52	126	222	99
Lane Group Flow (vph)	43	857	46	112	1216	349	57	220	241	133
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	1	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	9.5	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	85.0	85.0	85.0	17.0	102.0	102.0	45.0	45.0	13.0	58.0
Total Split (%)	53.1%	53.1%	53.1%	10.6%	63.8%	63.8%	28.1%	28.1%	8.1%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	0.0	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
v/c Ratio	0.21	0.45	0.06	0.28	0.56	0.34	0.31	0.78	1.14	0.32
Control Delay	20.7	19.5	1.6	10.4	15.3	3.2	60.9	76.5	151.4	46.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	19.5	1.6	10.4	15.3	3.2	60.9	76.5	151.4	46.9
Queue Length 50th (m)	6.0	75.0	0.0	10.6	98.9	5.6	16.2	62.7	~77.2	32.7
Queue Length 95th (m)	16.6	109.2	3.2	21.0	138.5	20.7	28.7	87.2	#122.7	48.9
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	208	1917	811	428	2183	1016	272	407	211	545
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.45	0.06	0.26	0.56	0.34	0.21	0.54	1.14	0.24

Intersection Summary
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 26 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East

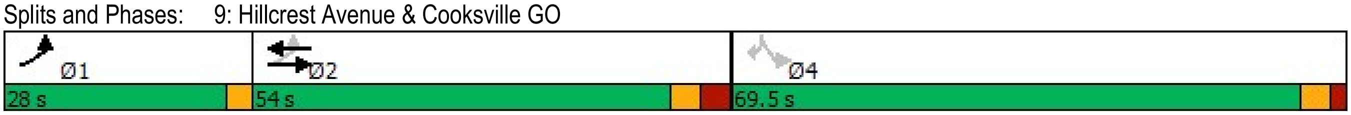
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	788	42	103	1119	321	52	126	76	222	99	23
Future Volume (vph)	40	788	42	103	1119	321	52	126	76	222	99	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1598	3189	1304	1604	3221	1360	1582	1616		1587	1661	
Flt Permitted	0.21	1.00	1.00	0.27	1.00	1.00	0.67	1.00		0.30	1.00	
Satd. Flow (perm)	347	3189	1304	459	3221	1360	1119	1616		506	1661	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	857	46	112	1216	349	57	137	83	241	108	25
RTOR Reduction (vph)	0	0	18	0	0	94	0	15	0	0	6	0
Lane Group Flow (vph)	43	857	28	112	1216	255	57	205	0	241	127	0
Confl. Peds. (#/hr)	16		13	13		16	14		10	10		14
Heavy Vehicles (%)	0%	3%	5%	0%	2%	0%	0%	0%	0%	1%	0%	3%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	95.3	95.3	95.3	107.5	107.5	107.5	25.5	25.5		38.5	38.5	
Effective Green, g (s)	96.3	96.3	96.3	108.5	108.5	108.5	26.5	26.5		39.5	39.5	
Actuated g/C Ratio	0.60	0.60	0.60	0.68	0.68	0.68	0.17	0.17		0.25	0.25	
Clearance Time (s)	7.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	208	1919	784	384	2184	922	185	267		199	410	
v/s Ratio Prot		0.27		0.02	c0.38			c0.13		c0.08	0.08	
v/s Ratio Perm	0.12		0.02	0.18		0.19	0.05			0.22		
v/c Ratio	0.21	0.45	0.04	0.29	0.56	0.28	0.31	0.77		1.21	0.31	
Uniform Delay, d1	14.5	17.3	13.0	10.1	13.3	10.2	58.7	63.8		58.2	49.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	0.8	0.1	0.4	1.0	0.7	1.0	12.4		132.2	0.4	
Delay (s)	16.7	18.1	13.0	10.5	14.3	10.9	59.6	76.2		190.5	49.6	
Level of Service	B	B	B	B	B	B	E	E		F	D	
Approach Delay (s)		17.8			13.4			72.8			140.4	
Approach LOS		B			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	136	337	381	73	361
Future Volume (vph)	136	337	381	73	361
Lane Group Flow (vph)	0	514	438	79	392
Turn Type	pm+pt	NA	NA	Perm	Perm
Protected Phases	1	2	2		
Permitted Phases	2			4	4
Detector Phase	1	2	2	4	4
Switch Phase					
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.5	32.0	32.0	34.5	34.5
Total Split (s)	28.0	54.0	54.0	69.5	69.5
Total Split (%)	18.5%	35.6%	35.6%	45.9%	45.9%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.0	3.5	3.5	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	4.5	4.5
Lead/Lag	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	None
v/c Ratio		0.21	0.19	0.38	0.68
Control Delay		4.5	4.4	31.8	9.9
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		4.5	4.4	31.8	9.9
Queue Length 50th (m)		7.1	8.6	9.4	0.0
Queue Length 95th (m)		12.5	15.6	21.0	21.7
Internal Link Dist (m)		132.4	206.4	85.2	
Turn Bay Length (m)					
Base Capacity (vph)		2484	2250	1193	1450
Starvation Cap Reductn		0	0	0	0
Spillback Cap Reductn		0	0	0	0
Storage Cap Reductn		0	0	0	0
Reduced v/c Ratio		0.21	0.19	0.07	0.27

Intersection Summary
Cycle Length: 151.5
Actuated Cycle Length: 70.4
Natural Cycle: 85
Control Type: Semi Act-Uncoord

Splits and Phases: 9: Hillcrest Avenue & Cooksville GO



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	136	337	381	22	73	361
Future Volume (vph)	136	337	381	22	73	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		4.5	4.5
Lane Util. Factor		0.91	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.98
Flpb, ped/bikes		1.00	1.00		0.98	1.00
Frt		1.00	0.99		1.00	0.85
Flt Protected		0.99	1.00		0.95	1.00
Satd. Flow (prot)		4871	3301		1264	1500
Flt Permitted		0.74	1.00		0.95	1.00
Satd. Flow (perm)		3652	3301		1264	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	366	414	24	79	392
RTOR Reduction (vph)	0	0	1	0	0	326
Lane Group Flow (vph)	0	514	437	0	79	66
Confl. Peds. (#/hr)	30			30	23	7
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	5%	6%	10%	0%	42%	7%
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	1	2	2			
Permitted Phases	2				4	4
Actuated Green, G (s)		47.0	47.0		10.8	10.8
Effective Green, g (s)		48.0	48.0		11.8	11.8
Actuated g/C Ratio		0.68	0.68		0.17	0.17
Clearance Time (s)		7.0	7.0		5.5	5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2493	2253		212	251
v/s Ratio Prot			0.13			
v/s Ratio Perm		c0.14			c0.06	0.04
v/c Ratio		0.21	0.19		0.37	0.26
Uniform Delay, d1		4.1	4.1		26.0	25.5
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.0	0.2		1.1	0.6
Delay (s)		4.2	4.3		27.1	26.0
Level of Service		A	A		C	C
Approach Delay (s)		4.2	4.3		26.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	86	58	6	148	59	14
Future Volume (Veh/h)	86	58	6	148	59	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	63	7	161	64	15
Pedestrians	21			6	30	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	2			1	3	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	137					
pX, platoon unblocked						
vC, conflicting volume			186		350	160
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			186		350	160
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			99		89	98
cM capacity (veh/h)			1361		602	860

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	156	168	79
Volume Left	0	7	64
Volume Right	63	0	15
cSH	1700	1361	638
Volume to Capacity	0.09	0.01	0.12
Queue Length 95th (m)	0.0	0.1	3.2
Control Delay (s)	0.0	0.4	11.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	11.4
Approach LOS			B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	166	43	14	289	13	41	38	26	12	32	15
Future Vol, veh/h	28	166	43	14	289	13	41	38	26	12	32	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	29	1	0	0	0	0	0	0	0	0	0	13
Mvmt Flow	30	180	47	15	314	14	45	41	28	13	35	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10.4	12.4	9.6	9.1
HCM LOS	B	B	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	39%	100%	0%	100%	0%	20%
Vol Thru, %	36%	0%	79%	0%	96%	54%
Vol Right, %	25%	0%	21%	0%	4%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	28	209	14	302	59
LT Vol	41	28	0	14	0	12
Through Vol	38	0	166	0	289	32
RT Vol	26	0	43	0	13	15
Lane Flow Rate	114	30	227	15	328	64
Geometry Grp	2	5	5	5	5	2
Degree of Util (X)	0.171	0.053	0.327	0.024	0.474	0.099
Departure Headway (Hd)	5.388	6.307	5.178	5.731	5.197	5.54
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	659	564	688	620	686	651
Service Time	3.482	4.093	2.962	3.51	2.975	3.54
HCM Lane V/C Ratio	0.173	0.053	0.33	0.024	0.478	0.098
HCM Control Delay	9.6	9.5	10.5	8.7	12.6	9.1
HCM Lane LOS	A	A	B	A	B	A
HCM 95th-tile Q	0.6	0.2	1.4	0.1	2.6	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	20	73	5	17	0	133	0	12	0	0	0
Future Volume (Veh/h)	0	20	73	5	17	0	133	0	12	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	79	5	18	0	145	0	13	0	0	0
Pedestrians		1			1			12				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		354										
pX, platoon unblocked												
vC, conflicting volume	18			113			102	102	74	104	141	19
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			113			102	102	74	104	141	19
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			83	100	99	100	100	100
cM capacity (veh/h)	1599			1472			860	777	981	855	739	1058

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	101	23	158
Volume Left	0	5	145
Volume Right	79	0	13
cSH	1700	1472	869
Volume to Capacity	0.06	0.00	0.18
Queue Length 95th (m)	0.0	0.1	5.0
Control Delay (s)	0.0	1.6	10.1
Lane LOS		A	B
Approach Delay (s)	0.0	1.6	10.1
Approach LOS			B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	180	313	154	53	15
Future Vol, veh/h	24	180	313	154	53	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	1	1	2	2	0
Mvmt Flow	26	196	340	167	58	16
Number of Lanes	1	1	1	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	2
HCM Control Delay	9.7	10.5	9.2
HCM LOS	A	B	A

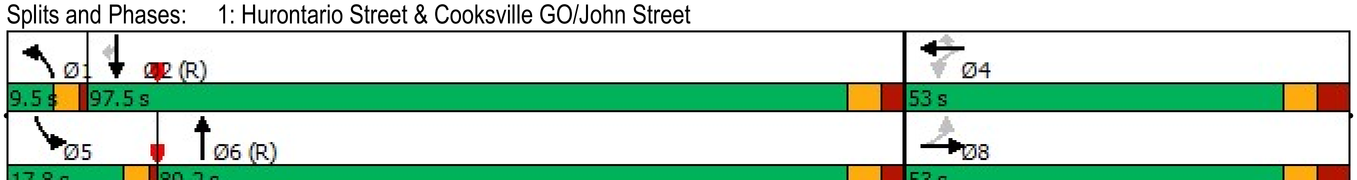
Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	78%
Vol Thru, %	0%	100%	100%	0%	0%
Vol Right, %	0%	0%	0%	100%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	180	313	154	68
LT Vol	24	0	0	0	53
Through Vol	0	180	313	0	0
RT Vol	0	0	0	154	15
Lane Flow Rate	26	196	340	167	74
Geometry Grp	5	5	5	5	2
Degree of Util (X)	0.041	0.28	0.464	0.197	0.113
Departure Headway (Hd)	5.638	5.152	4.915	4.229	5.481
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	635	697	735	849	653
Service Time	3.374	2.888	2.643	1.957	3.527
HCM Lane V/C Ratio	0.041	0.281	0.463	0.197	0.113
HCM Control Delay	8.6	9.9	11.8	8	9.2
HCM Lane LOS	A	A	B	A	A
HCM 95th-tile Q	0.1	1.1	2.5	0.7	0.4

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	328	30	7	19	159	15	1576	97	1305	296
Future Volume (vph)	328	30	7	19	159	15	1576	97	1305	296
Lane Group Flow (vph)	357	206	8	21	173	16	1730	105	1418	322
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases		8		4		1	6	5	2	
Permitted Phases	8		4		4		6		2	2
Detector Phase	8	8	4	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	46.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	9.5	89.2	17.8	97.5	97.5
Total Split (%)	33.1%	33.1%	33.1%	33.1%	33.1%	5.9%	55.8%	11.1%	60.9%	60.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	1.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
v/c Ratio	1.07	0.44	0.03	0.04	0.37	0.28	1.04	0.79	0.80	0.41
Control Delay	121.4	29.1	41.7	41.6	16.4	79.4	70.0	107.3	29.0	9.5
Queue Delay	0.0	66.6	0.0	0.0	0.0	0.0	23.8	0.0	50.2	0.0
Total Delay	121.4	95.7	41.7	41.6	16.4	79.4	93.8	107.3	79.2	9.5
Queue Length 50th (m)	~125.2	30.1	1.9	4.9	11.6	4.6	~319.6	33.1	161.8	20.9
Queue Length 95th (m)	#189.1	55.0	6.4	12.0	33.0	m5.7	m#329.6	#63.4	225.7	47.4
Internal Link Dist (m)		191.8		112.9			109.3		252.0	
Turn Bay Length (m)			25.0			37.5		48.5		48.5
Base Capacity (vph)	334	473	249	497	462	57	1656	141	1781	786
Starvation Cap Reductn	0	0	0	0	0	0	536	0	0	0
Spillback Cap Reductn	0	297	0	0	0	0	0	0	961	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	1.17	0.03	0.04	0.37	0.28	1.54	0.74	1.73	0.41

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	328	30	159	7	19	159	15	1576	16	97	1305	296
Future Volume (vph)	328	30	159	7	19	159	15	1576	16	97	1305	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.93	1.00	1.00		1.00	1.00	0.85
Flpb, ped/bikes	0.94	1.00		0.98	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1484	1429		1579	1729	1300	1409	3151		1530	2933	1187
Flt Permitted	0.74	1.00		0.52	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1162	1429		869	1729	1300	1409	3151		1530	2933	1187
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	357	33	173	8	21	173	16	1713	17	105	1418	322
RTOR Reduction (vph)	0	63	0	0	0	88	0	0	0	0	0	68
Lane Group Flow (vph)	357	143	0	8	21	85	16	1730	0	105	1418	254
Confl. Peds. (#/hr)	47		20	20		47	90		46	46		90
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	2%	0%	3%	0%	0%	5%	14%	4%	0%	5%	12%	3%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4		6			2	2
Actuated Green, G (s)	45.0	45.0		45.0	45.0	45.0	2.2	83.0		13.0	93.8	93.8
Effective Green, g (s)	46.0	46.0		46.0	46.0	46.0	3.2	84.0		14.0	94.8	94.8
Actuated g/C Ratio	0.29	0.29		0.29	0.29	0.29	0.02	0.52		0.09	0.59	0.59
Clearance Time (s)	8.0	8.0		8.0	8.0	8.0	4.0	7.0		4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	334	410		249	497	373	28	1654		133	1737	703
v/s Ratio Prot		0.10			0.01		0.01	c0.55		c0.07	0.48	
v/s Ratio Perm	c0.31			0.01		0.07						0.21
v/c Ratio	1.07	0.35		0.03	0.04	0.23	0.57	1.05		0.79	0.82	0.36
Uniform Delay, d1	57.0	45.1		41.0	41.1	43.4	77.7	38.0		71.6	25.7	16.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.19		1.00	1.00	1.00
Incremental Delay, d2	68.7	0.5		0.1	0.0	0.3	9.6	27.2		26.0	4.4	1.4
Delay (s)	125.7	45.7		41.0	41.1	43.8	87.3	72.4		97.5	30.1	18.3
Level of Service	F	D		D	D	D	F	E		F	C	B
Approach Delay (s)		96.4			43.4			72.5			31.9	
Approach LOS		F			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	57.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	288	37	22	31	167	40	1427	125	242	235
Future Volume (vph)	288	37	22	31	167	40	1427	125	242	235
Lane Group Flow (vph)	313	122	24	34	182	43	1577	136	263	255
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases		8		4		1	6	5	2	
Permitted Phases	8		4		4		6		2	2
Detector Phase	8	8	4	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	46.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	14.4	86.6	25.4	97.6	97.6
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	9.0%	54.1%	15.9%	61.0%	61.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	1.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
v/c Ratio	1.00	0.29	0.09	0.08	0.36	0.43	0.93	0.74	0.15	0.31
Control Delay	109.8	25.6	46.7	45.9	8.0	86.0	41.8	91.1	15.3	2.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	45.3	0.0	0.0	0.0
Total Delay	109.8	25.7	46.8	45.9	8.0	86.0	87.2	91.1	15.3	2.7
Queue Length 50th (m)	~100.8	14.9	5.9	8.3	0.0	13.1	195.8	42.3	19.7	0.0
Queue Length 95th (m)	#164.6	33.3	14.2	17.7	19.4	m26.8	#306.5	64.9	27.5	12.4
Internal Link Dist (m)		191.8		112.9			109.3		252.0	
Turn Bay Length (m)			25.0			37.5		48.5		48.5
Base Capacity (vph)	312	420	261	443	499	114	1697	224	1807	813
Starvation Cap Reductn	0	0	0	0	0	0	362	0	0	0
Spillback Cap Reductn	0	28	20	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.31	0.10	0.08	0.36	0.38	1.18	0.61	0.15	0.31

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 115 (72%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 125

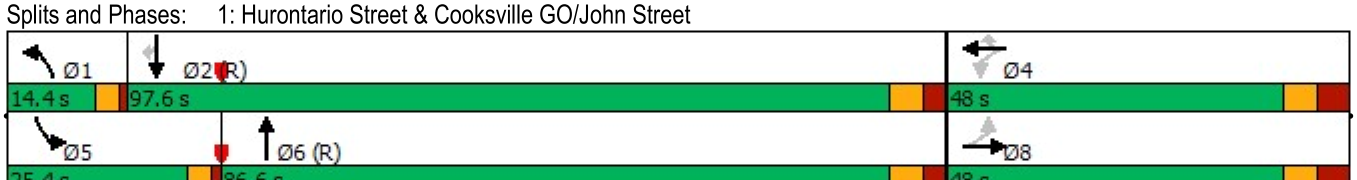
Control Type: Actuated-Coordinated

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

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

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

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	37	75	22	31	167	40	1427	24	125	242	235
Future Volume (vph)	288	37	75	22	31	167	40	1427	24	125	242	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.86
Flpb, ped/bikes	0.98	1.00		0.97	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1575	1462		1492	1729	1422	1606	3208		1606	3042	1195
Flt Permitted	0.73	1.00		0.65	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1219	1462		1023	1729	1422	1606	3208		1606	3042	1195
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	40	82	24	34	182	43	1551	26	136	263	255
RTOR Reduction (vph)	0	46	0	0	0	135	0	0	0	0	0	105
Lane Group Flow (vph)	313	76	0	24	34	47	43	1577	0	136	263	150
Confl. Peds. (#/hr)	16		24	24		16	81		34	34		81
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	0%	0%	5%	5%	0%	0%	0%	2%	0%	0%	8%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4		6			2	2
Actuated Green, G (s)	40.0	40.0		40.0	40.0	40.0	7.7	83.6		17.4	93.3	93.3
Effective Green, g (s)	41.0	41.0		41.0	41.0	41.0	8.7	84.6		18.4	94.3	94.3
Actuated g/C Ratio	0.26	0.26		0.26	0.26	0.26	0.05	0.53		0.11	0.59	0.59
Clearance Time (s)	8.0	8.0		8.0	8.0	8.0	4.0	7.0		4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	312	374		262	443	364	87	1696		184	1792	704
v/s Ratio Prot		0.05			0.02		0.03	c0.49		c0.08	0.09	
v/s Ratio Perm	c0.26			0.02		0.03						0.13
v/c Ratio	1.00	0.20		0.09	0.08	0.13	0.49	0.93		0.74	0.15	0.21
Uniform Delay, d1	59.5	46.7		45.3	45.1	45.8	73.5	34.9		68.5	14.8	15.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.01	0.88		1.00	1.00	1.00
Incremental Delay, d2	51.8	0.3		0.2	0.1	0.2	4.4	10.5		14.4	0.2	0.7
Delay (s)	111.3	46.9		45.5	45.2	45.9	78.4	41.2		82.9	14.9	16.1
Level of Service	F	D		D	D	D	E	D		F	B	B
Approach Delay (s)		93.2			45.8			42.2			29.5	
Approach LOS		F			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	47.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		

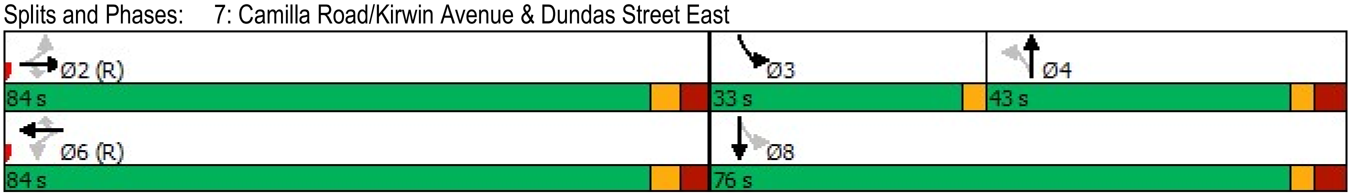
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	19	1088	59	56	637	137	60	91	255	97
Future Volume (vph)	19	1088	59	56	637	137	60	91	255	97
Lane Group Flow (vph)	21	1183	64	61	692	149	65	179	277	135
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2			6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	84.0	84.0	84.0	84.0	84.0	84.0	43.0	43.0	33.0	76.0
Total Split (%)	52.5%	52.5%	52.5%	52.5%	52.5%	52.5%	26.9%	26.9%	20.6%	47.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio	0.07	0.63	0.08	0.36	0.38	0.18	0.43	0.75	0.74	0.25
Control Delay	17.6	24.3	6.6	27.7	18.8	3.0	69.7	75.4	51.5	35.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	24.3	6.6	27.7	18.8	3.0	69.7	75.4	51.5	35.1
Queue Length 50th (m)	2.8	127.0	2.1	9.9	59.7	0.0	19.2	48.3	68.0	28.3
Queue Length 95th (m)	8.4	172.8	10.1	26.5	84.7	11.1	33.5	71.5	87.0	41.6
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	309	1881	809	169	1845	841	250	377	394	715
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.63	0.08	0.36	0.38	0.18	0.26	0.47	0.70	0.19

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 38 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1088	59	56	637	137	60	91	74	255	97	28
Future Volume (vph)	19	1088	59	56	637	137	60	91	74	255	97	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1428	3159	1327	1604	3099	1312	1534	1551		1558	1622	
Flt Permitted	0.35	1.00	1.00	0.17	1.00	1.00	0.67	1.00		0.35	1.00	
Satd. Flow (perm)	520	3159	1327	284	3099	1312	1083	1551		575	1622	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1183	64	61	692	149	65	99	80	277	105	30
RTOR Reduction (vph)	0	0	19	0	0	60	0	21	0	0	7	0
Lane Group Flow (vph)	21	1183	45	61	692	89	65	158	0	277	128	0
Confl. Peds. (#/hr)	6		5	5		6	15		3	3		15
Heavy Vehicles (%)	12%	4%	5%	0%	6%	6%	3%	1%	6%	3%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	94.3	94.3	94.3	94.3	94.3	94.3	21.5	21.5		51.7	51.7	
Effective Green, g (s)	95.3	95.3	95.3	95.3	95.3	95.3	22.5	22.5		52.7	52.7	
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60	0.60	0.14	0.14		0.33	0.33	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	309	1881	790	169	1845	781	152	218		362	534	
v/s Ratio Prot		c0.37			0.22			c0.10		c0.13	0.08	
v/s Ratio Perm	0.04		0.03	0.21		0.07	0.06			0.12		
v/c Ratio	0.07	0.63	0.06	0.36	0.38	0.11	0.43	0.73		0.77	0.24	
Uniform Delay, d1	13.6	20.9	13.5	16.7	16.8	14.0	62.9	65.8		44.3	39.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.6	0.1	5.9	0.6	0.3	1.9	11.4		9.3	0.2	
Delay (s)	14.1	22.5	13.7	22.6	17.4	14.3	64.8	77.2		53.6	39.3	
Level of Service	B	C	B	C	B	B	E	E		D	D	
Approach Delay (s)		21.9			17.3			73.9			48.9	
Approach LOS		C			B			E			D	

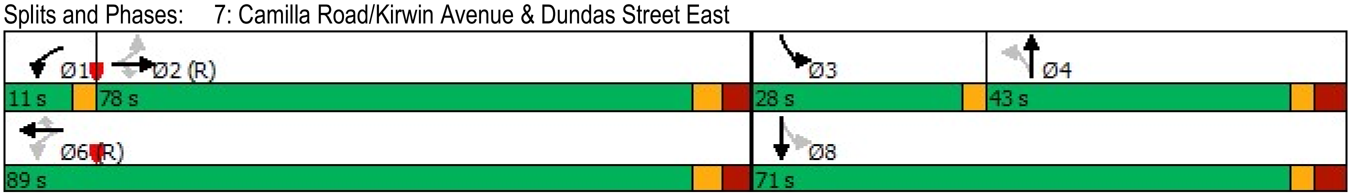
Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	40	788	42	103	1119	321	52	126	222	99
Future Volume (vph)	40	788	42	103	1119	321	52	126	222	99
Lane Group Flow (vph)	43	857	46	112	1216	349	57	220	241	133
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	1	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	9.5	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	78.0	78.0	78.0	11.0	89.0	89.0	43.0	43.0	28.0	71.0
Total Split (%)	48.8%	48.8%	48.8%	6.9%	55.6%	55.6%	26.9%	26.9%	17.5%	44.4%
Yellow Time (s)	3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	0.0	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
v/c Ratio	0.27	0.52	0.06	0.33	0.63	0.38	0.31	0.78	0.71	0.24
Control Delay	31.4	28.2	2.2	16.7	24.1	6.8	61.0	76.8	50.3	35.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	28.2	2.2	16.7	24.1	6.8	61.0	76.8	50.3	35.8
Queue Length 50th (m)	7.7	95.1	0.0	14.2	130.3	14.4	16.2	62.7	57.6	28.3
Queue Length 95th (m)	20.3	128.3	3.7	27.2	176.3	39.4	28.8	87.3	75.2	41.8
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	160	1659	711	337	1925	911	258	387	354	680
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.52	0.06	0.33	0.63	0.38	0.22	0.57	0.68	0.20

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 26 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	788	42	103	1119	321	52	126	76	222	99	23
Future Volume (vph)	40	788	42	103	1119	321	52	126	76	222	99	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3189	1304	1604	3221	1360	1582	1616		1587	1661	
Flt Permitted	0.18	1.00	1.00	0.25	1.00	1.00	0.67	1.00		0.30	1.00	
Satd. Flow (perm)	309	3189	1304	416	3221	1360	1119	1616		506	1661	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	857	46	112	1216	349	57	137	83	241	108	25
RTOR Reduction (vph)	0	0	22	0	0	98	0	15	0	0	6	0
Lane Group Flow (vph)	43	857	24	112	1216	251	57	205	0	241	127	0
Confl. Peds. (#/hr)	16		13	13		16	14		10	10		14
Heavy Vehicles (%)	0%	3%	5%	0%	2%	0%	0%	0%	0%	1%	0%	3%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	82.2	82.2	82.2	94.6	94.6	94.6	25.5	25.5		51.4	51.4	
Effective Green, g (s)	83.2	83.2	83.2	95.6	95.6	95.6	26.5	26.5		52.4	52.4	
Actuated g/C Ratio	0.52	0.52	0.52	0.60	0.60	0.60	0.17	0.17		0.33	0.33	
Clearance Time (s)	7.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	160	1658	678	325	1924	812	185	267		327	543	
v/s Ratio Prot		0.27		0.02	c0.38			c0.13		c0.11	0.08	
v/s Ratio Perm	0.14		0.02	0.18		0.18	0.05			0.13		
v/c Ratio	0.27	0.52	0.04	0.34	0.63	0.31	0.31	0.77		0.74	0.23	
Uniform Delay, d1	21.4	25.2	18.8	15.8	20.8	15.9	58.7	63.8		43.5	39.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.1	1.2	0.1	0.6	1.6	1.0	1.0	12.4		8.4	0.2	
Delay (s)	25.5	26.4	18.9	16.4	22.4	16.9	59.6	76.2		51.9	39.4	
Level of Service	C	C	B	B	C	B	E	E		D	D	
Approach Delay (s)		26.0			20.9			72.8			47.5	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	328	30	135	19	15	1576	147	1305	296
Future Volume (vph)	328	30	135	19	15	1576	147	1305	296
Lane Group Flow (vph)	357	206	147	319	16	1746	160	1418	322
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA	Perm
Protected Phases		8		4	1	6	5	2	
Permitted Phases	8		4			6		2	2
Detector Phase	8	8	4	4	1	6	5	2	2
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	64.0	64.0	64.0	64.0	9.5	81.0	15.0	86.5	86.5
Total Split (%)	40.0%	40.0%	40.0%	40.0%	5.9%	50.6%	9.4%	54.1%	54.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	1.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
v/c Ratio	1.20	0.36	0.45	0.33	0.28	1.18	1.40	0.90	0.46
Control Delay	162.2	23.4	44.7	26.4	78.0	125.9	275.1	42.2	14.7
Queue Delay	0.0	42.2	75.2	0.0	0.0	1.5	0.0	48.9	0.0
Total Delay	162.2	65.6	119.9	26.4	78.0	127.3	275.1	91.1	14.7
Queue Length 50th (m)	~137.1	27.2	35.8	26.3	4.6	~355.0	~67.6	195.4	30.6
Queue Length 95th (m)	#201.0	49.6	58.4	39.5	m5.7	m#366.3	#115.7	#278.5	62.2
Internal Link Dist (m)		191.8		112.9		109.3		252.0	
Turn Bay Length (m)			25.0		37.5		48.5		48.5
Base Capacity (vph)	297	565	330	961	57	1474	114	1579	705
Starvation Cap Reductn	0	0	0	0	0	447	0	0	0
Spillback Cap Reductn	0	365	219	0	0	0	0	813	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	1.03	1.32	0.33	0.28	1.70	1.40	1.85	0.46

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

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

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

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

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	328	30	159	135	19	274	15	1576	30	147	1305	296
Future Volume (vph)	328	30	159	135	19	274	15	1576	30	147	1305	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flpb, ped/bikes	0.96	1.00		0.98	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.86		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1518	1429		1578	2520		1409	3144		1530	2933	1187
Flt Permitted	0.52	1.00		0.56	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	836	1429		929	2520		1409	3144		1530	2933	1187
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	357	33	173	147	21	298	16	1713	33	160	1418	322
RTOR Reduction (vph)	0	56	0	0	64	0	0	1	0	0	0	69
Lane Group Flow (vph)	357	150	0	147	255	0	16	1745	0	160	1418	253
Confl. Peds. (#/hr)	47		20	20		47	90		46	46		90
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	2%	0%	3%	0%	0%	5%	14%	4%	0%	5%	12%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4				6			2	2
Actuated Green, G (s)	56.0	56.0		56.0	56.0		2.2	74.0		11.0	82.8	82.8
Effective Green, g (s)	57.0	57.0		57.0	57.0		3.2	75.0		12.0	83.8	83.8
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.02	0.47		0.08	0.52	0.52
Clearance Time (s)	8.0	8.0		8.0	8.0		4.0	7.0		4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	297	509		330	897		28	1473		114	1536	621
v/s Ratio Prot		0.10			0.10		0.01	c0.56		c0.10	0.48	
v/s Ratio Perm	c0.43			0.16								0.21
v/c Ratio	1.20	0.29		0.45	0.28		0.57	1.18		1.40	0.92	0.41
Uniform Delay, d1	51.5	37.0		39.4	36.9		77.7	42.5		74.0	35.1	23.1
Progression Factor	1.00	1.00		1.00	1.00		0.98	1.06		1.00	1.00	1.00
Incremental Delay, d2	118.6	0.3		1.0	0.2		9.8	85.8		225.8	10.7	2.0
Delay (s)	170.1	37.4		40.4	37.1		85.9	131.1		299.8	45.9	25.1
Level of Service	F	D		D	D		F	F		F	D	C
Approach Delay (s)		121.5			38.1			130.7			63.7	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	93.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	126.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	345	191	165	187	109	1171	106	1604
Future Volume (vph)	345	191	165	187	109	1171	106	1604
Lane Group Flow (vph)	375	469	179	354	118	1312	115	1961
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	3	8		4	1	6	5	2
Permitted Phases	8		4			6		2
Detector Phase	3	8	4	4	1	6	5	2
Switch Phase								
Minimum Initial (s)	5.0	8.0	8.0	8.0	7.0	8.0	5.0	8.0
Minimum Split (s)	9.5	56.0	56.0	56.0	11.0	51.5	9.5	51.5
Total Split (s)	11.0	67.0	56.0	56.0	13.0	76.4	16.6	80.0
Total Split (%)	6.9%	41.9%	35.0%	35.0%	8.1%	47.8%	10.4%	50.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	0.0	4.0	4.0	4.0	1.0	3.5	1.0	3.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	7.0	7.0	7.0	3.0	6.5	3.0	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	1.21	0.46	0.91	0.41	0.83	0.92	0.82	1.40
Control Delay	158.6	29.9	100.4	31.2	107.6	51.2	90.6	224.5
Queue Delay	3.2	0.0	0.0	0.0	0.0	49.1	0.0	1.0
Total Delay	161.8	29.9	100.4	31.2	107.6	100.3	90.6	225.6
Queue Length 50th (m)	~112.9	42.3	53.5	30.4	~43.2	214.6	37.3	~433.1
Queue Length 95th (m)	#189.3	57.5	#94.8	44.7	#90.5	#266.4	m#52.1	#473.8
Internal Link Dist (m)		206.4		133.2		400.9		109.3
Turn Bay Length (m)			50.0		53.0		36.0	
Base Capacity (vph)	311	1123	222	953	143	1432	142	1405
Starvation Cap Reductn	0	0	0	0	0	0	0	315
Spillback Cap Reductn	69	0	0	20	0	789	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.55	0.42	0.81	0.38	0.83	2.04	0.81	1.80

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 99 (62%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 150

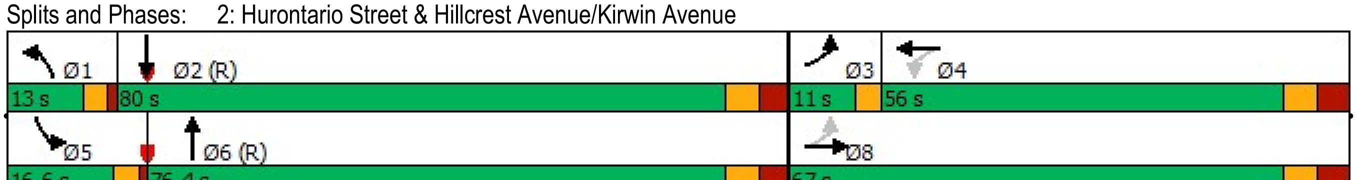
Control Type: Actuated-Coordinated

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

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

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

Splits and Phases: 2: Hurontario Street & Hillcrest Avenue/Kirwin Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	191	240	165	187	139	109	1171	36	106	1604	201
Future Volume (vph)	345	191	240	165	187	139	109	1171	36	106	1604	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	2.0	7.0		7.0	7.0		3.0	6.5		3.0	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.94		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1553	2780		1428	2837		1460	3056		1575	3047	
Flt Permitted	0.44	1.00		0.48	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	718	2780		726	2837		1460	3056		1575	3047	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	375	208	261	179	203	151	118	1273	39	115	1743	218
RTOR Reduction (vph)	0	85	0	0	89	0	0	1	0	0	6	0
Lane Group Flow (vph)	375	384	0	179	265	0	118	1311	0	115	1955	0
Confl. Peds. (#/hr)	18		42	42		18	96		4	4		96
Heavy Vehicles (%)	3%	4%	6%	10%	7%	7%	10%	7%	5%	2%	5%	2%
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases	8			4				6			2	
Actuated Green, G (s)	53.3	53.3		42.3	42.3		14.7	73.9		13.3	72.5	
Effective Green, g (s)	54.3	54.3		43.3	43.3		15.7	74.9		14.3	73.5	
Actuated g/C Ratio	0.34	0.34		0.27	0.27		0.10	0.47		0.09	0.46	
Clearance Time (s)	3.0	8.0		8.0	8.0		4.0	7.5		4.0	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	290	943		196	767		143	1430		140	1399	
v/s Ratio Prot	c0.07	0.14			0.09		c0.08	0.43		0.07	c0.64	
v/s Ratio Perm	0.37			c0.25								
v/c Ratio	1.29	0.41		0.91	0.35		0.83	0.92		0.82	1.40	
Uniform Delay, d1	52.1	40.5		56.5	46.9		70.8	39.6		71.6	43.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.83	1.41	
Incremental Delay, d2	155.2	0.3		40.6	0.3		30.5	10.8		23.7	182.1	
Delay (s)	207.3	40.8		97.1	47.2		101.3	50.4		83.4	243.1	
Level of Service	F	D		F	D		F	D		F	F	
Approach Delay (s)		114.8			64.0			54.6			234.2	
Approach LOS		F			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	142.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	128.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	29	1088	59	56	637	161	60	93	350	101
Future Volume (vph)	29	1088	59	56	637	161	60	93	350	101
Lane Group Flow (vph)	32	1183	64	61	692	175	65	181	380	140
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2			6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	84.0	84.0	84.0	84.0	84.0	84.0	43.0	43.0	33.0	76.0
Total Split (%)	52.5%	52.5%	52.5%	52.5%	52.5%	52.5%	26.9%	26.9%	20.6%	47.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio	0.11	0.65	0.08	0.39	0.39	0.21	0.42	0.75	0.94	0.25
Control Delay	18.7	26.0	6.7	29.9	20.0	3.0	69.2	75.6	74.6	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	26.0	6.7	29.9	20.0	3.0	69.2	75.6	74.6	34.0
Queue Length 50th (m)	4.5	129.9	2.1	10.3	61.1	0.0	19.2	49.2	100.0	29.1
Queue Length 95th (m)	11.6	173.9	10.1	27.3	85.2	11.8	33.4	72.3	#127.3	42.8
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	296	1823	786	158	1789	831	249	377	404	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.65	0.08	0.39	0.39	0.21	0.26	0.48	0.94	0.20

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

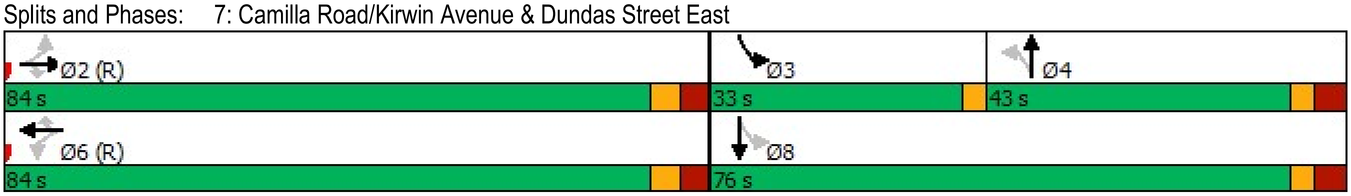
Offset: 38 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	1088	59	56	637	161	60	93	74	350	101	28
Future Volume (vph)	29	1088	59	56	637	161	60	93	74	350	101	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1428	3159	1327	1604	3099	1312	1534	1553		1558	1624	
Flt Permitted	0.34	1.00	1.00	0.16	1.00	1.00	0.67	1.00		0.35	1.00	
Satd. Flow (perm)	514	3159	1327	273	3099	1312	1078	1553		573	1624	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	1183	64	61	692	175	65	101	80	380	110	30
RTOR Reduction (vph)	0	0	20	0	0	74	0	20	0	0	7	0
Lane Group Flow (vph)	32	1183	44	61	692	101	65	161	0	380	133	0
Confl. Peds. (#/hr)	6		5	5		6	15		3	3		15
Heavy Vehicles (%)	12%	4%	5%	0%	6%	6%	3%	1%	6%	3%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	91.4	91.4	91.4	91.4	91.4	91.4	21.8	21.8		54.6	54.6	
Effective Green, g (s)	92.4	92.4	92.4	92.4	92.4	92.4	22.8	22.8		55.6	55.6	
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.58	0.58	0.14	0.14		0.35	0.35	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	296	1824	766	157	1789	757	153	221		388	564	
v/s Ratio Prot		c0.37			0.22			c0.10		c0.19	0.08	
v/s Ratio Perm	0.06		0.03	0.22		0.08	0.06			0.15		
v/c Ratio	0.11	0.65	0.06	0.39	0.39	0.13	0.42	0.73		0.98	0.24	
Uniform Delay, d1	15.2	22.8	14.8	18.4	18.4	15.5	62.6	65.7		46.7	37.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	1.8	0.1	7.1	0.6	0.4	1.9	11.4		39.7	0.2	
Delay (s)	16.0	24.6	14.9	25.5	19.0	15.8	64.5	77.1		86.4	37.3	
Level of Service	B	C	B	C	B	B	E	E		F	D	
Approach Delay (s)		23.9			18.8			73.8			73.2	
Approach LOS		C			B			E			E	

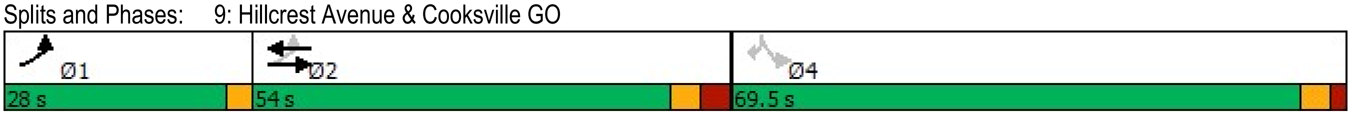
Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
9: Hillcrest Avenue & Cooksville GO

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	257	562	323	17	217
Future Volume (vph)	257	562	323	17	217
Lane Group Flow (vph)	0	890	371	18	236
Turn Type	pm+pt	NA	NA	Perm	Perm
Protected Phases	1	2	2		
Permitted Phases	2			4	4
Detector Phase	1	2	2	4	4
Switch Phase					
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	32.0	32.0	34.5	34.5
Total Split (s)	28.0	54.0	54.0	69.5	69.5
Total Split (%)	18.5%	35.6%	35.6%	45.9%	45.9%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.0	3.5	3.5	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	4.5	4.5
Lead/Lag	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	None
v/c Ratio		0.35	0.16	0.09	0.54
Control Delay		4.9	4.0	26.3	9.3
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		4.9	4.0	26.3	9.3
Queue Length 50th (m)		14.1	7.1	2.0	0.0
Queue Length 95th (m)		20.1	11.4	7.1	17.0
Internal Link Dist (m)		132.4	206.4	85.2	
Turn Bay Length (m)					
Base Capacity (vph)		2514	2278	1200	1451
Starvation Cap Reductn		0	0	0	0
Spillback Cap Reductn		0	0	0	0
Storage Cap Reductn		0	0	0	0
Reduced v/c Ratio		0.35	0.16	0.01	0.16

Intersection Summary
Cycle Length: 151.5
Actuated Cycle Length: 69.9
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 9: Hillcrest Avenue & Cooksville GO



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	257	562	323	18	17	217
Future Volume (vph)	257	562	323	18	17	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		4.5	4.5
Lane Util. Factor		0.91	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.98
Flpb, ped/bikes		1.00	1.00		0.98	1.00
Frt		1.00	0.99		1.00	0.85
Flt Protected		0.98	1.00		0.95	1.00
Satd. Flow (prot)		4863	3301		1264	1500
Flt Permitted		0.74	1.00		0.95	1.00
Satd. Flow (perm)		3656	3301		1264	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	279	611	351	20	18	236
RTOR Reduction (vph)	0	0	1	0	0	199
Lane Group Flow (vph)	0	890	370	0	18	37
Confl. Peds. (#/hr)	30			30	23	7
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	5%	6%	10%	0%	42%	7%
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	1	2	2			
Permitted Phases	2				4	4
Actuated Green, G (s)		47.3	47.3		10.1	10.1
Effective Green, g (s)		48.3	48.3		11.1	11.1
Actuated g/C Ratio		0.69	0.69		0.16	0.16
Clearance Time (s)		7.0	7.0		5.5	5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2526	2280		200	238
v/s Ratio Prot			0.11			
v/s Ratio Perm		c0.24			0.01	c0.02
v/c Ratio		0.35	0.16		0.09	0.16
Uniform Delay, d1		4.4	3.8		25.1	25.4
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.2		0.2	0.3
Delay (s)		4.5	3.9		25.3	25.7
Level of Service		A	A		C	C
Approach Delay (s)		4.5	3.9		25.6	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	14.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	155	53	8	375	46	11
Future Volume (Veh/h)	155	53	8	375	46	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	168	58	9	408	50	12
Pedestrians	4			2	13	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	137					
pX, platoon unblocked						
vC, conflicting volume			239		640	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			239		640	212
tC, single (s)			4.4		6.5	6.5
tC, 2 stage (s)						
tF (s)			2.5		3.6	3.6
p0 queue free %			99		88	98
cM capacity (veh/h)			1152		413	745

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	226	417	62
Volume Left	0	9	50
Volume Right	58	0	12
cSH	1700	1152	452
Volume to Capacity	0.13	0.01	0.14
Queue Length 95th (m)	0.0	0.2	3.6
Control Delay (s)	0.0	0.3	14.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	14.2
Approach LOS			B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	202	18	7	150	10	14	21	10	21	30	20
Future Vol, veh/h	21	202	18	7	150	10	14	21	10	21	30	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	39	1	6	0	6	10	0	7	10	0	4	20
Mvmt Flow	23	220	20	8	163	11	15	23	11	23	33	22
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10	9.5	8.4	8.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	31%	100%	0%	100%	0%	30%
Vol Thru, %	47%	0%	92%	0%	94%	42%
Vol Right, %	22%	0%	8%	0%	6%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	21	220	7	160	71
LT Vol	14	21	0	7	0	21
Through Vol	21	0	202	0	150	30
RT Vol	10	0	18	0	10	20
Lane Flow Rate	49	23	239	8	174	77
Geometry Grp	2	5	5	5	5	2
Degree of Util (X)	0.068	0.039	0.328	0.012	0.247	0.106
Departure Headway (Hd)	5.019	6.146	4.937	5.552	5.108	4.939
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	711	583	727	644	703	724
Service Time	3.066	3.881	2.671	3.289	2.844	2.982
HCM Lane V/C Ratio	0.069	0.039	0.329	0.012	0.248	0.106
HCM Control Delay	8.4	9.1	10.1	8.4	9.5	8.6
HCM Lane LOS	A	A	B	A	A	A
HCM 95th-tile Q	0.2	0.1	1.4	0	1	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	15	176	9	15	162	6
Future Volume (Veh/h)	15	176	9	15	162	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	191	10	16	176	7
Pedestrians	2			1	11	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	354					
pX, platoon unblocked						
vC, conflicting volume			218		160	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		160	124
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		78	99
cM capacity (veh/h)			1350		817	922

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	207	26	183
Volume Left	0	10	176
Volume Right	191	0	7
cSH	1700	1350	820
Volume to Capacity	0.12	0.01	0.22
Queue Length 95th (m)	0.0	0.2	6.5
Control Delay (s)	0.0	3.0	10.6
Lane LOS		A	B
Approach Delay (s)	0.0	3.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	225	131	153	183	16
Future Vol, veh/h	25	225	131	153	183	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	3	9	2	1	0
Mvmt Flow	27	245	142	166	199	17
Number of Lanes	1	1	1	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	2
HCM Control Delay	11.3	9.3	11
HCM LOS	B	A	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	92%
Vol Thru, %	0%	100%	100%	0%	0%
Vol Right, %	0%	0%	0%	100%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	225	131	153	199
LT Vol	25	0	0	0	183
Through Vol	0	225	131	0	0
RT Vol	0	0	0	153	16
Lane Flow Rate	27	245	142	166	216
Geometry Grp	5	5	5	5	2
Degree of Util (X)	0.045	0.371	0.219	0.218	0.323
Departure Headway (Hd)	5.912	5.459	5.544	4.717	5.384
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	601	653	642	753	662
Service Time	3.691	3.237	3.321	2.493	3.463
HCM Lane V/C Ratio	0.045	0.375	0.221	0.22	0.326
HCM Control Delay	9	11.5	9.9	8.8	11
HCM Lane LOS	A	B	A	A	B
HCM 95th-tile Q	0.1	1.7	0.8	0.8	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	166	134	0	99	248
Future Volume (Veh/h)	0	166	134	0	99	248
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	180	146	0	108	270
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		264				
pX, platoon unblocked						
vC, conflicting volume	146				326	146
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	146				326	146
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				84	70
cM capacity (veh/h)	1436				668	901

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	180	146	378
Volume Left	0	0	108
Volume Right	0	0	270
cSH	1436	1700	819
Volume to Capacity	0.00	0.09	0.46
Queue Length 95th (m)	0.0	0.0	18.7
Control Delay (s)	0.0	0.0	13.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.1
Approach LOS			B

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	71	192	134	43	0	0
Future Volume (Veh/h)	71	192	134	43	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	209	146	47	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		330				
pX, platoon unblocked						
vC, conflicting volume	193				532	170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	193				532	170
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				100	100
cM capacity (veh/h)	1380				479	874

Direction, Lane #	EB 1	WB 1
Volume Total	286	193
Volume Left	77	0
Volume Right	0	47
cSH	1380	1700
Volume to Capacity	0.06	0.11
Queue Length 95th (m)	1.3	0.0
Control Delay (s)	2.5	0.0
Lane LOS	A	
Approach Delay (s)	2.5	0.0
Approach LOS		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	288	37	70	31	40	1427	218	242	235
Future Volume (vph)	288	37	70	31	40	1427	218	242	235
Lane Group Flow (vph)	313	122	76	282	43	1611	237	263	255
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA	Perm
Protected Phases		8		4	1	6	5	2	
Permitted Phases	8		4			6		2	2
Detector Phase	8	8	4	4	1	6	5	2	2
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	56.0	56.0	56.0	56.0	14.4	79.8	24.2	89.6	89.6
Total Split (%)	35.0%	35.0%	35.0%	35.0%	9.0%	49.9%	15.1%	56.0%	56.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	1.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
v/c Ratio	1.13	0.25	0.24	0.28	0.43	1.09	1.12	0.16	0.33
Control Delay	141.4	20.8	44.1	12.4	86.7	92.2	157.2	19.2	3.3
Queue Delay	0.0	0.0	0.1	0.0	0.0	3.5	0.0	0.0	0.0
Total Delay	141.4	20.9	44.2	12.4	86.7	95.7	157.2	19.2	3.3
Queue Length 50th (m)	~114.6	12.9	18.2	9.1	12.9	~300.9	~86.1	22.2	0.0
Queue Length 95th (m)	#175.9	29.8	33.0	20.7	m26.8	#343.5	#141.4	31.0	14.0
Internal Link Dist (m)		191.8		112.9		109.3		252.0	
Turn Bay Length (m)			25.0		37.5		48.5		48.5
Base Capacity (vph)	278	493	319	991	114	1473	212	1655	766
Starvation Cap Reductn	0	0	0	0	0	281	0	0	0
Spillback Cap Reductn	0	23	16	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.26	0.25	0.28	0.38	1.35	1.12	0.16	0.33

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 115 (72%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 145

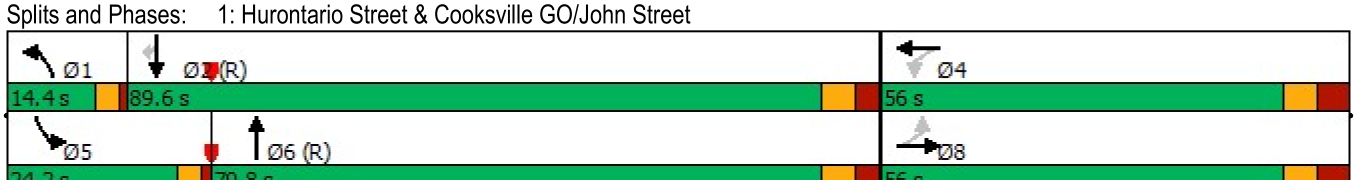
Control Type: Actuated-Coordinated

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

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

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

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	37	75	70	31	228	40	1427	55	218	242	235
Future Volume (vph)	288	37	75	70	31	228	40	1427	55	218	242	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.97		1.00	1.00		1.00	1.00	0.86
Flpb, ped/bikes	0.99	1.00		0.97	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.87		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1585	1462		1491	2770		1606	3192		1606	3042	1195
Flt Permitted	0.54	1.00		0.66	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	907	1462		1042	2770		1606	3192		1606	3042	1195
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	40	82	76	34	248	43	1551	60	237	263	255
RTOR Reduction (vph)	0	46	0	0	143	0	0	2	0	0	0	117
Lane Group Flow (vph)	313	76	0	76	139	0	43	1609	0	237	263	138
Confl. Peds. (#/hr)	16		24	24		16	81		34	34		81
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	0%	0%	5%	5%	0%	0%	0%	2%	0%	0%	8%	4%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4				6			2	2
Actuated Green, G (s)	48.0	48.0		48.0	48.0		7.7	72.8		20.2	85.3	85.3
Effective Green, g (s)	49.0	49.0		49.0	49.0		8.7	73.8		21.2	86.3	86.3
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.05	0.46		0.13	0.54	0.54
Clearance Time (s)	8.0	8.0		8.0	8.0		4.0	7.0		4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	277	447		319	848		87	1472		212	1640	644
v/s Ratio Prot		0.05			0.05		0.03	c0.50		c0.15	0.09	
v/s Ratio Perm	c0.35			0.07								0.12
v/c Ratio	1.13	0.17		0.24	0.16		0.49	1.09		1.12	0.16	0.21
Uniform Delay, d1	55.5	40.6		41.5	40.5		73.5	43.1		69.4	18.6	19.2
Progression Factor	1.00	1.00		1.00	1.00		1.02	0.95		1.00	1.00	1.00
Incremental Delay, d2	93.7	0.2		0.4	0.1		4.4	53.3		97.1	0.2	0.8
Delay (s)	149.2	40.8		41.9	40.6		79.1	94.3		166.5	18.8	19.9
Level of Service	F	D		D	D		E	F		F	B	B
Approach Delay (s)		118.8			40.9			93.9			65.5	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	84.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	116.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	131	255	86	318	197	144	223	180
Future Volume (vph)	131	255	86	318	197	144	223	180
Lane Group Flow (vph)	142	398	93	503	214	230	242	276
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	3	8		4	1	6	5	2
Permitted Phases	8		4			6		2
Detector Phase	3	8	4	4	1	6	5	2
Switch Phase								
Minimum Initial (s)	5.0	8.0	8.0	8.0	7.0	8.0	5.0	8.0
Minimum Split (s)	9.5	56.0	56.0	56.0	11.0	51.5	9.5	51.5
Total Split (s)	13.0	69.0	56.0	56.0	37.0	53.0	38.0	54.0
Total Split (%)	8.1%	43.1%	35.0%	35.0%	23.1%	33.1%	23.8%	33.8%
Yellow Time (s)	3.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	0.0	4.0	4.0	4.0	1.0	3.5	1.0	3.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	7.0	7.0	7.0	3.0	6.5	3.0	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.72	0.46	0.59	0.79	0.80	0.18	0.82	0.20
Control Delay	63.4	42.7	73.2	65.0	84.3	24.2	85.8	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.6	0.7	0.0
Total Delay	63.4	42.7	73.2	65.0	84.3	25.8	86.6	21.7
Queue Length 50th (m)	34.7	48.6	27.3	74.3	66.2	18.0	78.9	20.9
Queue Length 95th (m)	50.4	60.6	45.2	89.6	90.4	32.8	106.1	32.2
Internal Link Dist (m)		206.4		133.2		400.9		109.3
Turn Bay Length (m)			50.0		53.0		36.0	
Base Capacity (vph)	196	1201	250	976	338	1304	358	1394
Starvation Cap Reductn	0	0	0	0	0	0	18	0
Spillback Cap Reductn	0	0	0	7	0	897	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.33	0.37	0.52	0.63	0.57	0.71	0.20

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 104 (65%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 2: Hurontario Street & Hillcrest Avenue/Kirwin Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	255	111	86	318	144	197	144	67	223	180	74
Future Volume (vph)	131	255	111	86	318	144	197	144	67	223	180	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	2.0	7.0		7.0	7.0		3.0	6.5		3.0	6.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.97	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1589	3022		1506	3083		1575	2922		1606	3038	
Flt Permitted	0.22	1.00		0.52	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	371	3022		820	3083		1575	2922		1606	3038	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	277	121	93	346	157	214	157	73	242	196	80
RTOR Reduction (vph)	0	37	0	0	38	0	0	27	0	0	21	0
Lane Group Flow (vph)	142	361	0	93	465	0	214	203	0	242	255	0
Confl. Peds. (#/hr)	16		60	60		16	24		49	49		24
Heavy Vehicles (%)	1%	0%	5%	3%	1%	0%	2%	5%	0%	0%	2%	3%
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases	8			4				6			2	
Actuated Green, G (s)	42.9	42.9		29.9	29.9		26.3	69.0		28.6	71.3	
Effective Green, g (s)	43.9	43.9		30.9	30.9		27.3	70.0		29.6	72.3	
Actuated g/C Ratio	0.27	0.27		0.19	0.19		0.17	0.44		0.19	0.45	
Clearance Time (s)	3.0	8.0		8.0	8.0		4.0	7.5		4.0	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	829		158	595		268	1278		297	1372	
v/s Ratio Prot	c0.05	0.12			c0.15		0.14	0.07		c0.15	c0.08	
v/s Ratio Perm	0.16			0.11								
v/c Ratio	0.77	0.44		0.59	0.78		0.80	0.16		0.81	0.19	
Uniform Delay, d1	47.9	47.8		58.8	61.3		63.7	27.2		62.6	26.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.04	0.86	
Incremental Delay, d2	17.2	0.4		5.5	6.6		15.2	0.3		15.6	0.3	
Delay (s)	65.1	48.2		64.3	68.0		78.9	27.5		80.9	23.0	
Level of Service	E	D		E	E		E	C		F	C	
Approach Delay (s)		52.7			67.4			52.3			50.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	56.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	61	788	42	103	1119	391	52	128	286	101
Future Volume (vph)	61	788	42	103	1119	391	52	128	286	101
Lane Group Flow (vph)	66	857	46	112	1216	425	57	222	311	135
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	1	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	9.5	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	78.0	78.0	78.0	11.0	89.0	89.0	43.0	43.0	28.0	71.0
Total Split (%)	48.8%	48.8%	48.8%	6.9%	55.6%	55.6%	26.9%	26.9%	17.5%	44.4%
Yellow Time (s)	3.5	3.5	3.5	3.0	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	0.0	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
v/c Ratio	0.43	0.53	0.07	0.34	0.64	0.46	0.31	0.78	0.87	0.24
Control Delay	39.4	29.2	2.2	17.4	25.2	7.5	60.7	76.8	64.5	35.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	29.2	2.2	17.4	25.2	7.5	60.7	76.8	64.5	35.0
Queue Length 50th (m)	13.2	96.3	0.0	14.5	132.0	18.5	16.1	63.6	77.7	28.6
Queue Length 95th (m)	32.7	128.3	3.7	27.4	177.2	49.1	28.7	88.1	#105.3	42.1
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	152	1620	696	328	1886	919	258	387	359	680
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.53	0.07	0.34	0.64	0.46	0.22	0.57	0.87	0.20

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

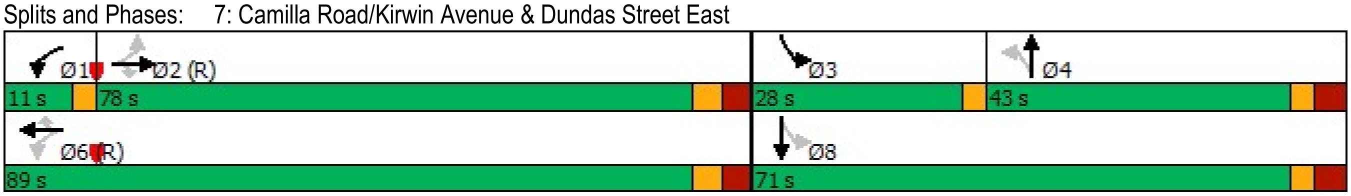
Offset: 26 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

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

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East



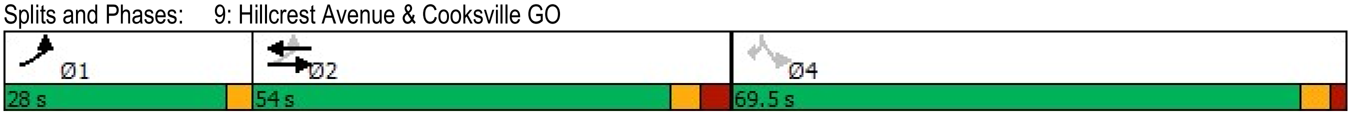
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	788	42	103	1119	391	52	128	76	286	101	23
Future Volume (vph)	61	788	42	103	1119	391	52	128	76	286	101	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3189	1304	1605	3221	1360	1582	1617		1587	1662	
Flt Permitted	0.18	1.00	1.00	0.24	1.00	1.00	0.67	1.00		0.30	1.00	
Satd. Flow (perm)	302	3189	1304	408	3221	1360	1117	1617		503	1662	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	66	857	46	112	1216	425	57	139	83	311	110	25
RTOR Reduction (vph)	0	0	23	0	0	123	0	14	0	0	6	0
Lane Group Flow (vph)	66	857	23	112	1216	302	57	208	0	311	129	0
Confl. Peds. (#/hr)	16		13	13		16	14		10	10		14
Heavy Vehicles (%)	0%	3%	5%	0%	2%	0%	0%	0%	0%	1%	0%	3%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	80.3	80.3	80.3	92.7	92.7	92.7	25.7	25.7		53.3	53.3	
Effective Green, g (s)	81.3	81.3	81.3	93.7	93.7	93.7	26.7	26.7		54.3	54.3	
Actuated g/C Ratio	0.51	0.51	0.51	0.59	0.59	0.59	0.17	0.17		0.34	0.34	
Clearance Time (s)	7.0	7.0	7.0	3.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	153	1620	662	316	1886	796	186	269		344	564	
v/s Ratio Prot		0.27		0.02	c0.38			c0.13		c0.14	0.08	
v/s Ratio Perm	0.22		0.02	0.18		0.22	0.05			0.16		
v/c Ratio	0.43	0.53	0.04	0.35	0.64	0.38	0.31	0.77		0.90	0.23	
Uniform Delay, d1	24.8	26.5	19.7	16.7	22.1	17.7	58.5	63.7		44.5	37.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.6	1.2	0.1	0.7	1.7	1.4	0.9	12.9		25.9	0.2	
Delay (s)	33.4	27.7	19.8	17.4	23.8	19.0	59.5	76.6		70.4	38.1	
Level of Service	C	C	B	B	C	B	E	E		E	D	
Approach Delay (s)		27.7			22.2			73.1			60.6	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	136	342	382	73	361
Future Volume (vph)	136	342	382	73	361
Lane Group Flow (vph)	0	520	439	79	392
Turn Type	pm+pt	NA	NA	Perm	Perm
Protected Phases	1	2	2		
Permitted Phases	2			4	4
Detector Phase	1	2	2	4	4
Switch Phase					
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.5	32.0	32.0	34.5	34.5
Total Split (s)	28.0	54.0	54.0	69.5	69.5
Total Split (%)	18.5%	35.6%	35.6%	45.9%	45.9%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.0	3.5	3.5	2.0	2.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		6.0	6.0	4.5	4.5
Lead/Lag	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	None
v/c Ratio		0.21	0.20	0.38	0.68
Control Delay		4.5	4.4	31.8	9.9
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		4.5	4.4	31.8	9.9
Queue Length 50th (m)		7.2	8.6	9.4	0.0
Queue Length 95th (m)		12.7	15.6	21.0	21.7
Internal Link Dist (m)		132.4	206.4	85.2	
Turn Bay Length (m)					
Base Capacity (vph)		2488	2250	1193	1450
Starvation Cap Reductn		0	0	0	0
Spillback Cap Reductn		0	0	0	0
Storage Cap Reductn		0	0	0	0
Reduced v/c Ratio		0.21	0.20	0.07	0.27

Intersection Summary
Cycle Length: 151.5
Actuated Cycle Length: 70.4
Natural Cycle: 85
Control Type: Semi Act-Uncoord

Splits and Phases: 9: Hillcrest Avenue & Cooksville GO



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	136	342	382	22	73	361
Future Volume (vph)	136	342	382	22	73	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		4.5	4.5
Lane Util. Factor		0.91	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.98
Flpb, ped/bikes		1.00	1.00		0.98	1.00
Frt		1.00	0.99		1.00	0.85
Flt Protected		0.99	1.00		0.95	1.00
Satd. Flow (prot)		4872	3301		1264	1500
Flt Permitted		0.74	1.00		0.95	1.00
Satd. Flow (perm)		3656	3301		1264	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	372	415	24	79	392
RTOR Reduction (vph)	0	0	1	0	0	326
Lane Group Flow (vph)	0	520	438	0	79	66
Confl. Peds. (#/hr)	30			30	23	7
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	5%	6%	10%	0%	42%	7%
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	1	2	2			
Permitted Phases	2				4	4
Actuated Green, G (s)		47.0	47.0		10.8	10.8
Effective Green, g (s)		48.0	48.0		11.8	11.8
Actuated g/C Ratio		0.68	0.68		0.17	0.17
Clearance Time (s)		7.0	7.0		5.5	5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2496	2253		212	251
v/s Ratio Prot			0.13			
v/s Ratio Perm		c0.14			c0.06	0.04
v/c Ratio		0.21	0.19		0.37	0.26
Uniform Delay, d1		4.1	4.1		26.0	25.5
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.0	0.2		1.1	0.6
Delay (s)		4.2	4.3		27.1	26.0
Level of Service		A	A		C	C
Approach Delay (s)		4.2	4.3		26.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	14.5
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	210	58	6	257	59	30
Future Volume (Veh/h)	210	58	6	257	59	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	63	7	279	64	33
Pedestrians	21			6	30	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	2			1	3	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	137					
pX, platoon unblocked						
vC, conflicting volume			321		604	296
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			321		604	296
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			99		85	95
cM capacity (veh/h)			1215		428	724

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	291	286	97
Volume Left	0	7	64
Volume Right	63	0	33
cSH	1700	1215	497
Volume to Capacity	0.17	0.01	0.20
Queue Length 95th (m)	0.0	0.1	5.4
Control Delay (s)	0.0	0.2	14.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	14.0
Approach LOS			B

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	182	43	14	289	13	41	38	26	12	32	15
Future Vol, veh/h	44	182	43	14	289	13	41	38	26	12	32	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	29	1	0	0	0	0	0	0	0	0	0	13
Mvmt Flow	48	198	47	15	314	14	45	41	28	13	35	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10.6	12.6	9.8	9.3
HCM LOS	B	B	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	39%	100%	0%	100%	0%	20%
Vol Thru, %	36%	0%	81%	0%	96%	54%
Vol Right, %	25%	0%	19%	0%	4%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	44	225	14	302	59
LT Vol	41	44	0	14	0	12
Through Vol	38	0	182	0	289	32
RT Vol	26	0	43	0	13	15
Lane Flow Rate	114	48	245	15	328	64
Geometry Grp	2	5	5	5	5	2
Degree of Util (X)	0.176	0.084	0.353	0.024	0.478	0.1
Departure Headway (Hd)	5.566	6.316	5.196	5.778	5.244	5.629
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	648	562	685	614	679	640
Service Time	3.566	4.109	2.989	3.567	3.032	3.633
HCM Lane V/C Ratio	0.176	0.085	0.358	0.024	0.483	0.1
HCM Control Delay	9.8	9.7	10.8	8.7	12.8	9.3
HCM Lane LOS	A	A	B	A	B	A
HCM 95th-tile Q	0.6	0.3	1.6	0.1	2.6	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	20	139	5	17	242	12
Future Volume (Veh/h)	20	139	5	17	242	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	151	5	18	263	13
Pedestrians	1			1	12	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	354					
pX, platoon unblocked						
vC, conflicting volume			185		138	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			185		138	110
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		69	99
cM capacity (veh/h)			1386		844	937

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	173	23	276
Volume Left	0	5	263
Volume Right	151	0	13
cSH	1700	1386	848
Volume to Capacity	0.10	0.00	0.33
Queue Length 95th (m)	0.0	0.1	10.8
Control Delay (s)	0.0	1.7	11.3
Lane LOS		A	B
Approach Delay (s)	0.0	1.7	11.3
Approach LOS			B

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	180	313	247	119	15
Future Vol, veh/h	40	180	313	247	119	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	1	1	2	2	0
Mvmt Flow	43	196	340	268	129	16
Number of Lanes	1	1	1	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	2
HCM Control Delay	10.4	11.4	10.6
HCM LOS	B	B	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	89%
Vol Thru, %	0%	100%	100%	0%	0%
Vol Right, %	0%	0%	0%	100%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	180	313	247	134
LT Vol	40	0	0	0	119
Through Vol	0	180	313	0	0
RT Vol	0	0	0	247	15
Lane Flow Rate	43	196	340	268	146
Geometry Grp	5	5	5	5	2
Degree of Util (X)	0.073	0.3	0.49	0.335	0.233
Departure Headway (Hd)	6.007	5.519	5.186	4.498	5.754
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	592	646	691	792	619
Service Time	3.791	3.303	2.949	2.261	3.835
HCM Lane V/C Ratio	0.073	0.303	0.492	0.338	0.236
HCM Control Delay	9.3	10.7	12.9	9.5	10.6
HCM Lane LOS	A	B	B	A	B
HCM 95th-tile Q	0.2	1.3	2.7	1.5	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	240	150	0	66	109
Future Volume (Veh/h)	0	240	150	0	66	109
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	261	163	0	72	118
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		264				
pX, platoon unblocked						
vC, conflicting volume	163				424	163
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	163				424	163
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				88	87
cM capacity (veh/h)	1416				587	882

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	261	163	190
Volume Left	0	0	72
Volume Right	0	0	118
cSH	1416	1700	741
Volume to Capacity	0.00	0.10	0.26
Queue Length 95th (m)	0.0	0.0	7.8
Control Delay (s)	0.0	0.0	11.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.5
Approach LOS			B

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	140	166	150	109	0	0
Future Volume (Veh/h)	140	166	150	109	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	152	180	163	118	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		330				
pX, platoon unblocked						
vC, conflicting volume	281				706	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	281				706	222
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				100	100
cM capacity (veh/h)	1282				355	818

Direction, Lane #	EB 1	WB 1
Volume Total	332	281
Volume Left	152	0
Volume Right	0	118
cSH	1282	1700
Volume to Capacity	0.12	0.17
Queue Length 95th (m)	3.1	0.0
Control Delay (s)	4.3	0.0
Lane LOS	A	
Approach Delay (s)	4.3	0.0
Approach LOS		

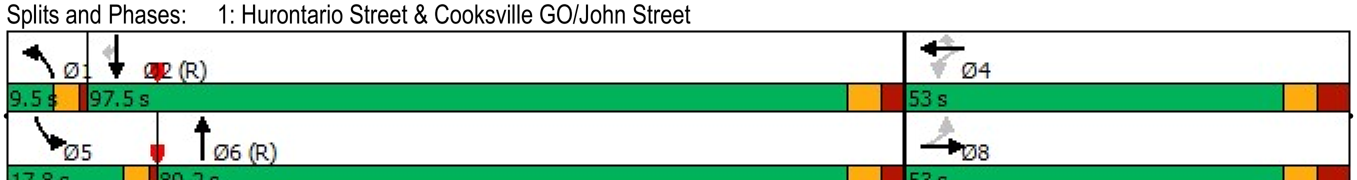
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	328	30	135	19	274	15	1576	147	1305	296
Future Volume (vph)	328	30	135	19	274	15	1576	147	1305	296
Lane Group Flow (vph)	357	206	147	21	298	16	1746	160	1418	322
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases		8		4		1	6	5	2	
Permitted Phases	8		4		4		6		2	2
Detector Phase	8	8	4	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	46.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	9.5	89.2	17.8	97.5	97.5
Total Split (%)	33.1%	33.1%	33.1%	33.1%	33.1%	5.9%	55.8%	11.1%	60.9%	60.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	1.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
v/c Ratio	1.07	0.44	0.59	0.04	0.65	0.28	1.07	1.13	0.80	0.41
Control Delay	121.4	29.1	60.2	41.6	35.6	78.5	78.2	177.9	29.0	9.5
Queue Delay	0.0	66.6	79.0	0.0	0.0	0.0	14.8	0.0	50.2	0.0
Total Delay	121.4	95.7	139.1	41.6	35.6	78.5	93.0	177.9	79.2	9.5
Queue Length 50th (m)	~125.2	30.1	40.4	4.9	49.4	4.6	~325.8	~58.8	161.8	20.9
Queue Length 95th (m)	#189.1	55.0	66.3	12.0	84.5	m5.7	m#333.8	#106.9	225.7	47.4
Internal Link Dist (m)		191.8		112.9			109.3		252.0	
Turn Bay Length (m)			25.0			37.5		48.5		48.5
Base Capacity (vph)	334	473	249	497	462	57	1635	141	1781	786
Starvation Cap Reductn	0	0	0	0	0	0	532	0	0	0
Spillback Cap Reductn	0	297	161	0	0	0	0	0	962	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	1.17	1.67	0.04	0.65	0.28	1.58	1.13	1.73	0.41

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	328	30	159	135	19	274	15	1576	30	147	1305	296
Future Volume (vph)	328	30	159	135	19	274	15	1576	30	147	1305	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.93	1.00	1.00		1.00	1.00	0.85
Flpb, ped/bikes	0.94	1.00		0.98	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1484	1429		1579	1729	1300	1409	3144		1530	2933	1187
Flt Permitted	0.74	1.00		0.52	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1162	1429		869	1729	1300	1409	3144		1530	2933	1187
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	357	33	173	147	21	298	16	1713	33	160	1418	322
RTOR Reduction (vph)	0	63	0	0	0	88	0	1	0	0	0	68
Lane Group Flow (vph)	357	143	0	147	21	210	16	1745	0	160	1418	254
Confl. Peds. (#/hr)	47		20	20		47	90		46	46		90
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	2%	0%	3%	0%	0%	5%	14%	4%	0%	5%	12%	3%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4		6			2	2
Actuated Green, G (s)	45.0	45.0		45.0	45.0	45.0	2.2	82.2		13.8	93.8	93.8
Effective Green, g (s)	46.0	46.0		46.0	46.0	46.0	3.2	83.2		14.8	94.8	94.8
Actuated g/C Ratio	0.29	0.29		0.29	0.29	0.29	0.02	0.52		0.09	0.59	0.59
Clearance Time (s)	8.0	8.0		8.0	8.0	8.0	4.0	7.0		4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	334	410		249	497	373	28	1634		141	1737	703
v/s Ratio Prot		0.10			0.01		0.01	c0.56		c0.10	0.48	
v/s Ratio Perm	c0.31			0.17		0.16						0.21
v/c Ratio	1.07	0.35		0.59	0.04	0.56	0.57	1.07		1.13	0.82	0.36
Uniform Delay, d1	57.0	45.1		48.9	41.1	48.4	77.7	38.4		72.6	25.7	16.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.99	1.18		1.00	1.00	1.00
Incremental Delay, d2	68.7	0.5		3.7	0.0	1.9	8.6	35.3		116.6	4.4	1.4
Delay (s)	125.7	45.7		52.6	41.1	50.4	85.8	80.7		189.2	30.1	18.3
Level of Service	F	D		D	D	D	F	F		F	C	B
Approach Delay (s)		96.4			50.7			80.7			41.5	
Approach LOS		F			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	63.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	125.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	288	37	70	31	228	40	1427	218	242	235
Future Volume (vph)	288	37	70	31	228	40	1427	218	242	235
Lane Group Flow (vph)	313	122	76	34	248	43	1611	237	263	255
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases		8		4		1	6	5	2	
Permitted Phases	8		4		4		6		2	2
Detector Phase	8	8	4	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	46.0	46.0	46.0	46.0	46.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	14.4	86.6	25.4	97.6	97.6
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	9.0%	54.1%	15.9%	61.0%	61.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	1.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
v/c Ratio	1.00	0.29	0.29	0.08	0.48	0.43	1.00	1.06	0.15	0.31
Control Delay	109.8	25.6	51.5	45.9	13.3	86.8	57.4	139.4	15.3	2.7
Queue Delay	0.0	0.1	0.2	0.0	0.0	0.0	36.5	0.0	0.0	0.0
Total Delay	109.8	25.7	51.7	45.9	13.3	86.8	93.9	139.4	15.3	2.7
Queue Length 50th (m)	~100.8	14.9	19.6	8.3	10.1	12.9	~241.1	~82.1	19.7	0.0
Queue Length 95th (m)	#164.6	33.3	35.5	17.7	36.2	m26.9	#319.3	#137.4	27.5	12.4
Internal Link Dist (m)		191.8		112.9			109.3		252.0	
Turn Bay Length (m)			25.0			37.5		48.5		48.5
Base Capacity (vph)	312	420	261	443	518	114	1608	224	1807	813
Starvation Cap Reductn	0	0	0	0	0	0	321	0	0	0
Spillback Cap Reductn	0	24	17	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.31	0.31	0.08	0.48	0.38	1.25	1.06	0.15	0.31

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 115 (72%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 145

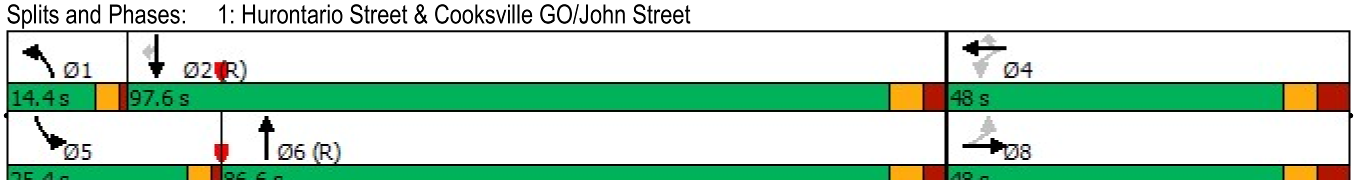
Control Type: Actuated-Coordinated

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

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

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

Splits and Phases: 1: Hurontario Street & Cooksville GO/John Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	37	75	70	31	228	40	1427	55	218	242	235
Future Volume (vph)	288	37	75	70	31	228	40	1427	55	218	242	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.86
Flpb, ped/bikes	0.98	1.00		0.97	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1575	1462		1492	1729	1422	1606	3192		1606	3042	1195
Flt Permitted	0.73	1.00		0.65	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1219	1462		1023	1729	1422	1606	3192		1606	3042	1195
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	40	82	76	34	248	43	1551	60	237	263	255
RTOR Reduction (vph)	0	46	0	0	0	154	0	1	0	0	0	105
Lane Group Flow (vph)	313	76	0	76	34	94	43	1610	0	237	263	150
Confl. Peds. (#/hr)	16		24	24		16	81		34	34		81
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	0%	0%	5%	5%	0%	0%	0%	2%	0%	0%	8%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4		6			2	2
Actuated Green, G (s)	40.0	40.0		40.0	40.0	40.0	7.7	79.6		21.4	93.3	93.3
Effective Green, g (s)	41.0	41.0		41.0	41.0	41.0	8.7	80.6		22.4	94.3	94.3
Actuated g/C Ratio	0.26	0.26		0.26	0.26	0.26	0.05	0.50		0.14	0.59	0.59
Clearance Time (s)	8.0	8.0		8.0	8.0	8.0	4.0	7.0		4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	312	374		262	443	364	87	1607		224	1792	704
v/s Ratio Prot		0.05			0.02		0.03	c0.50		c0.15	0.09	
v/s Ratio Perm	c0.26			0.07		0.07						0.13
v/c Ratio	1.00	0.20		0.29	0.08	0.26	0.49	1.00		1.06	0.15	0.21
Uniform Delay, d1	59.5	46.7		47.8	45.1	47.4	73.5	39.7		68.8	14.8	15.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.02	0.88		1.00	1.00	1.00
Incremental Delay, d2	51.8	0.3		0.6	0.1	0.4	4.3	22.8		76.3	0.2	0.7
Delay (s)	111.3	46.9		48.4	45.2	47.8	79.2	57.6		145.1	14.9	16.1
Level of Service	F	D		D	D	D	E	E		F	B	B
Approach Delay (s)		93.2			47.7			58.1			56.2	
Approach LOS		F			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	61.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	29	1088	59	56	637	161	60	93	350	101
Future Volume (vph)	29	1088	59	56	637	161	60	93	350	101
Lane Group Flow (vph)	32	1183	64	61	692	175	65	181	380	140
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2			6			4	3	8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	3	8
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	43.0	43.0	9.5	43.0
Total Split (s)	80.0	80.0	80.0	80.0	80.0	80.0	45.0	45.0	35.0	80.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	28.1%	28.1%	21.9%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	0.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	2.0	6.0
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio	0.11	0.66	0.08	0.40	0.39	0.21	0.42	0.75	0.91	0.24
Control Delay	19.8	27.3	7.0	32.2	21.0	3.1	69.3	75.1	66.4	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	27.3	7.0	32.2	21.0	3.1	69.3	75.1	66.4	32.8
Queue Length 50th (m)	4.6	134.1	2.2	10.6	63.1	0.0	19.2	48.9	97.8	28.5
Queue Length 95th (m)	12.0	178.8	10.4	28.6	87.6	12.2	33.4	72.0	#121.0	41.9
Internal Link Dist (m)		302.1			262.5			162.3		279.0
Turn Bay Length (m)	15.0		30.0	30.0		65.0	36.0		40.0	
Base Capacity (vph)	289	1792	774	151	1758	820	263	396	422	757
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.66	0.08	0.40	0.39	0.21	0.25	0.46	0.90	0.18

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

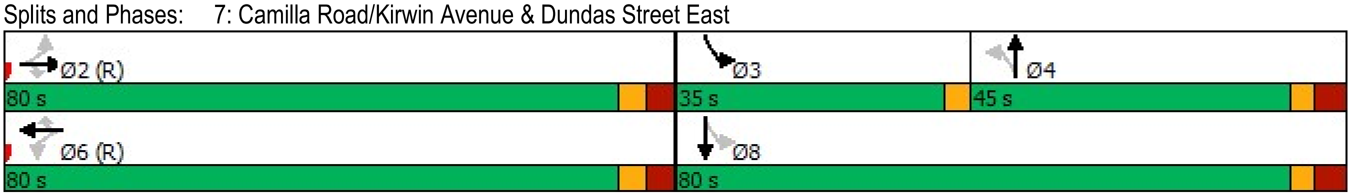
Offset: 38 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Splits and Phases: 7: Camilla Road/Kirwin Avenue & Dundas Street East



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	1088	59	56	637	161	60	93	74	350	101	28
Future Volume (vph)	29	1088	59	56	637	161	60	93	74	350	101	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1428	3159	1327	1604	3099	1312	1534	1553		1558	1624	
Flt Permitted	0.34	1.00	1.00	0.16	1.00	1.00	0.67	1.00		0.35	1.00	
Satd. Flow (perm)	510	3159	1327	267	3099	1312	1078	1553		573	1624	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	1183	64	61	692	175	65	101	80	380	110	30
RTOR Reduction (vph)	0	0	21	0	0	76	0	21	0	0	7	0
Lane Group Flow (vph)	32	1183	43	61	692	99	65	160	0	380	133	0
Confl. Peds. (#/hr)	6		5	5		6	15		3	3		15
Heavy Vehicles (%)	12%	4%	5%	0%	6%	6%	3%	1%	6%	3%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	89.8	89.8	89.8	89.8	89.8	89.8	21.8	21.8		56.2	56.2	
Effective Green, g (s)	90.8	90.8	90.8	90.8	90.8	90.8	22.8	22.8		57.2	57.2	
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.57	0.57	0.14	0.14		0.36	0.36	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	289	1792	753	151	1758	744	153	221		404	580	
v/s Ratio Prot		c0.37			0.22			c0.10		c0.19	0.08	
v/s Ratio Perm	0.06		0.03	0.23		0.08	0.06			0.15		
v/c Ratio	0.11	0.66	0.06	0.40	0.39	0.13	0.42	0.73		0.94	0.23	
Uniform Delay, d1	16.0	23.9	15.5	19.4	19.3	16.2	62.6	65.6		44.6	36.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	1.9	0.1	7.8	0.7	0.4	1.9	11.2		30.0	0.2	
Delay (s)	16.7	25.9	15.6	27.3	19.9	16.6	64.5	76.8		74.6	36.2	
Level of Service	B	C	B	C	B	B	E	E		E	D	
Approach Delay (s)		25.1			19.8			73.6			64.3	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX G:

Future Improvement Excerpts

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In progress City project

Hurontario Light Rail Transit

A provincially-owned system that will bring fast and reliable rapid transit to the cities of Mississauga and Brampton along the Hurontario corridor.

What's on this page

About

Hurontario Light Rail Transit (LRT) will provide 18 km of rapid transit with 19 stops on a dedicated right-of-way and will link to GO Stations at Port Credit and Cooksville, the Mississauga Transitway, Square One GO Bus Terminal, Brampton Gateway Terminal, and key MiWay and Brampton Transit routes.

Metrolinx, the provincial government agency responsible for leading the project, is naming the Hurontario LRT project as the Hazel McCallion Line, to commemorate the former Mississauga mayor.

Mobilinx, a consortium of local and international companies, was awarded the contract to design, build, finance, operate and maintain the system.

The City of Mississauga's Rapid Transit Program Office is working closely with Metrolinx.

Major construction began in spring 2020. As the project lead, Metrolinx continues to advise that substantial completion remains

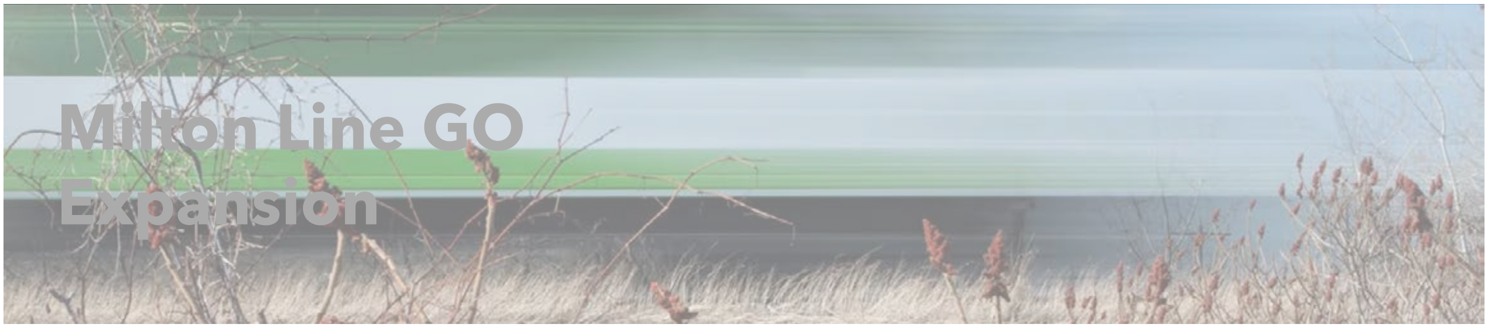
2024 contractually. The construction period is expected to bring impacts and disruptions to residents and businesses. The project team has committed to informing the public and stakeholders with as much notice as possible of potential disruptions.

Moving forward with this project represents a major step towards transformational transit improvements in Mississauga and Brampton—part of Metrolinx's long-term vision for an integrated, sustainable transit network connecting the Greater Toronto and Hamilton Area.

Hurontario LRT forms a critical link for businesses and residents along the Hurontario corridor. In the next two decades, about a quarter of the City's employment and residents will be along this corridor.

Locally-assembled Alstom light rail vehicles will be utilized as part of Hurontario LRT.

The Downtown Loop continues to be a top city building priority for Mississauga and staff remain open to working with all levels of government to see this implemented. The Loop can be added at anytime without affecting LRT operations.



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Projects & Programs > Milton Line GO Expansion > What We're Building > Cooksville GO Station

JUMP TO

Project overview

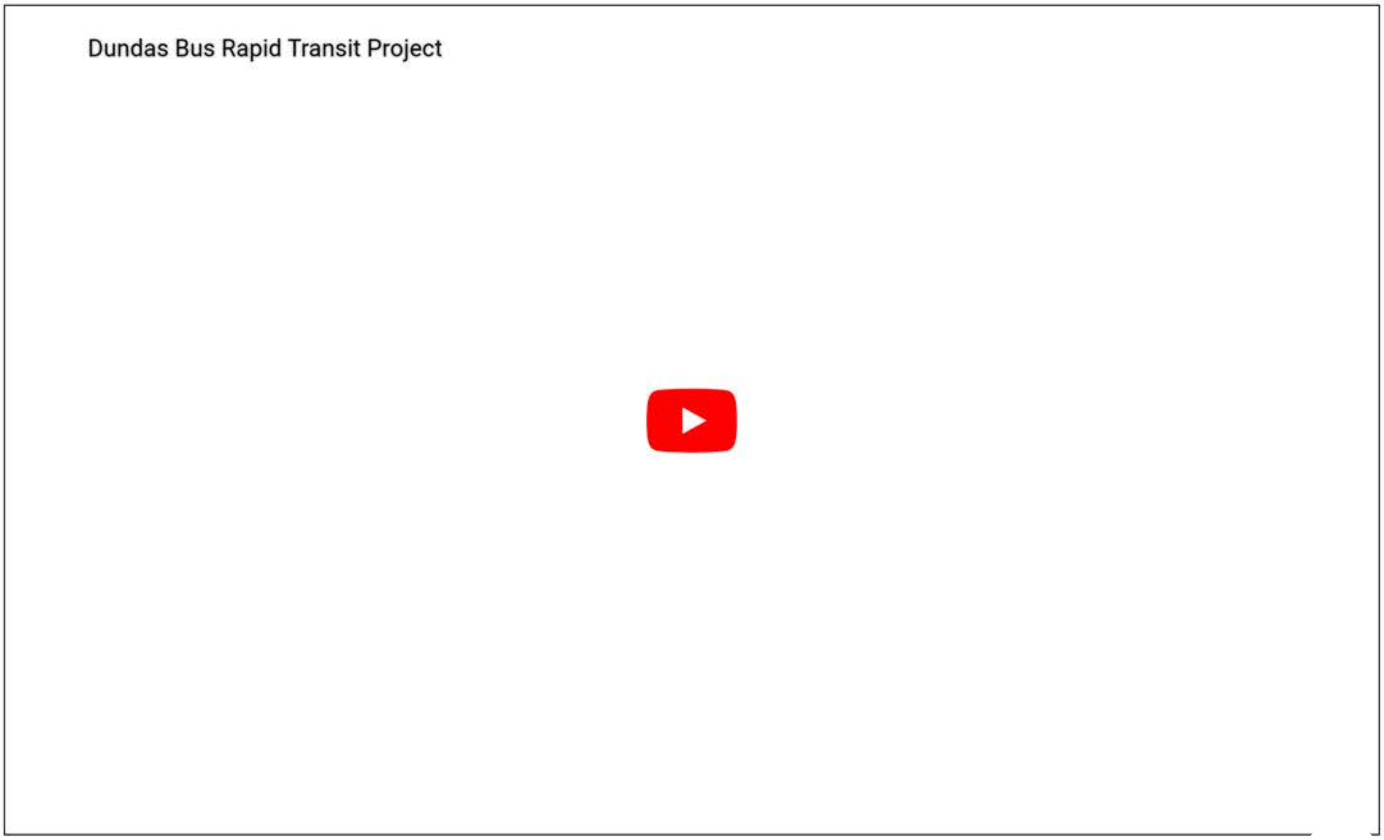
Cooksville GO Station

A better station experience, giving you more reasons to GO

Overview

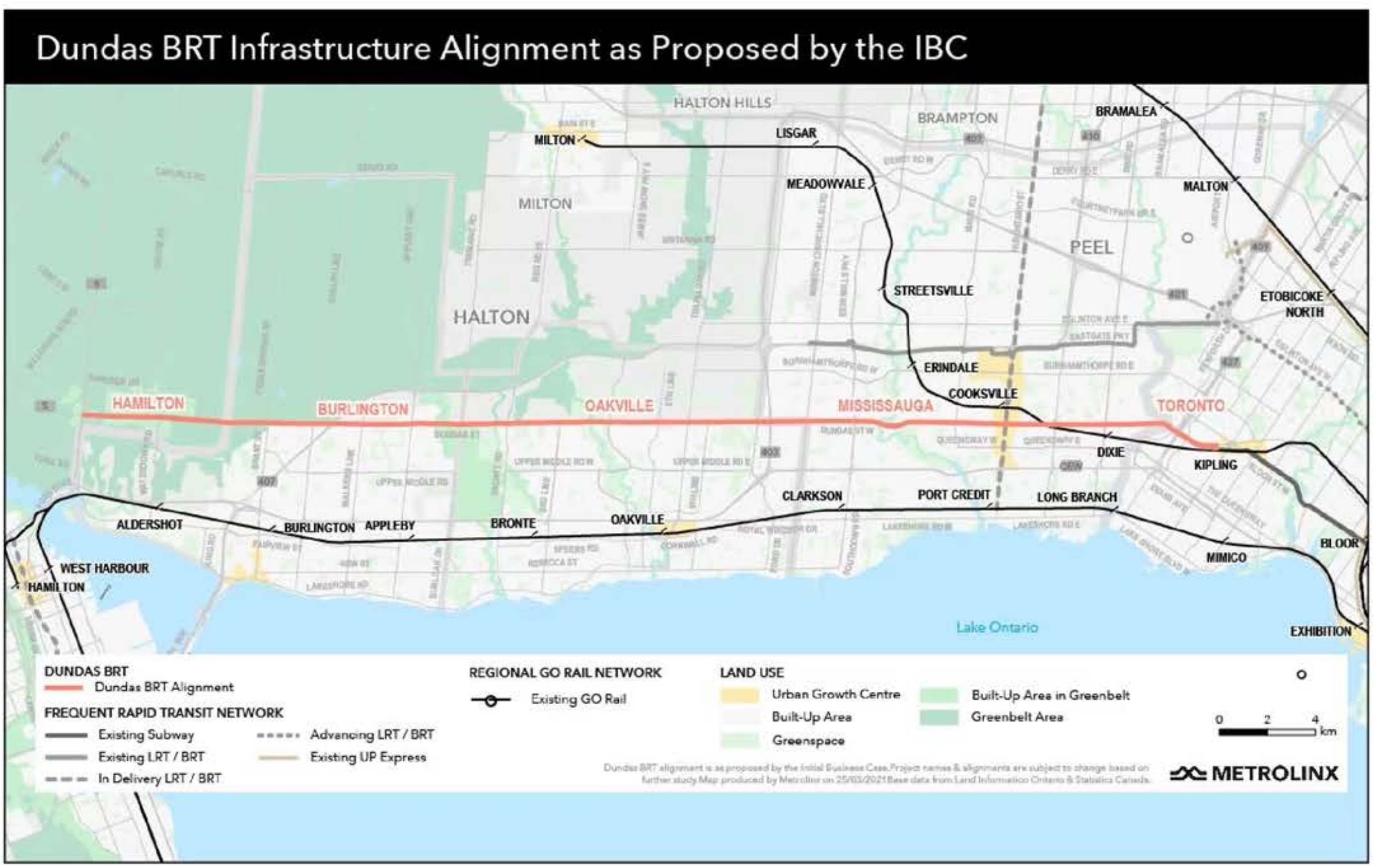
Metrolinx is continuing to advance planning for the Dundas Bus Rapid Transit (BRT) corridor, based on key findings in the Dundas Connects Master Plan and the **Metrolinx Initial Business Case** (IBC). The purpose of the Dundas BRT project is to evaluate the proposed transit corridor along a 48 kilometre stretch of Dundas Street from Highway 6 in the City of Hamilton through to the Kipling Transit Hub in the City of Toronto, linking Etobicoke and Mississauga City Centres. More than 20 kilometres, of the 48-kilometre BRT, would operate in bus lanes or in a dedicated right-of-way, separate from other traffic, allowing faster and more reliable transit connections.

Previous municipal planning studies and the Metrolinx IBC confirmed the need for improved bus transit infrastructure along Dundas Street.



Learn more about the proposed Dundas Bus Rapid Transit project connecting Toronto, Peel, Halton and Hamilton.

Proposed Dundas BRT alignment



Project Background

Find out more about the Dundas BRT project and download a copy of the project background document outlining **Planning a rapid transit corridor to connect the cities of Hamilton, Burlington, Oakville, Mississauga, and Toronto**.

Dundas BRT Benefits

Faster, more reliable

Service expansion on Dundas would allow for more frequent and reliable service reducing travel times and helping to alleviate congestion.

Reduce greenhouse gas

Sustainable travel is encouraged with increased access to reliable and convenient public transit. Fewer vehicles means less congestion and pollution.

Improve Connectivity

Low inter-municipal travel demand equals opportunity for improved bus rapid transit service along corridor to link urban centres and key destinations.

Invest for growth

Improved transit services along corridor potentially supports population and employment growth, local businesses and development of mobility hubs.

Related Projects

Hamilton LRT

14 kilometres of modern light rail transit running between McMaster University and Eastgate Square.

Milton Line GO Expansion

More trips, more connections.

TORONTO REGION PEEL HALTON

Kitchener Line GO Expansion

We're transforming the Kitchener Line into a two-way, all-day rapid transit line.

PEEL TORONTO REGION

Lakeshore Expansion

Improvemer the Lakesho support mo service.

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Hazel McCallion Line - Frequently Asked Questions

Construction

Opportunities on the project

Operations

COVID-19

Project scope

Accessibility related

Projects & Programs > Hazel McCallion LRT > FAQs

Hazel McCallion Line - Frequently Asked Questions

If you have questions about what's going on in your neighbourhood, we'd like to hear from you. Here's how to get in touch with the Hazel McCallion Line team:

Call us:

(416) 202-7500

Email:

peel@metrolinx.com

Construction

What's happening at Port Credit GO station? How will parking be impacted?

Will there be any underground stations?

Will businesses be affected by the construction?

How will I know when major construction will begin in my community?

How will traffic be affected during the construction period?

How will the Hazel McCallion Line connect with the Operations, Maintenance and Storage Facility (OMSF)?

How will the Port Credit GO station stop be built? Will it impact rail service on the Lakeshore West Line?

use trail on the east side south of the Queensway.

How often will the Hazel McCallion Line run?

Why are you removing medians?

If Brampton Gateway is the last stop, why is construction going past Steeles?

Opportunities on the project

How do I apply for procurement opportunities with the contractor?

Mobilinx is the contractor responsible for design, construction, and 30-year operations and maintenance of the Hazel McCallion Line. Information on procurement opportunities are posted at **www.mobilinx.ca/opportunities**.

I want a job with Mobilinx, what do I do?

How do you become a member of the team constructing the Hazel McCallion Line?

How do you become a vendor for the project?

Operations

What will access to residential streets and businesses look like when the Hazel McCallion Line is in service?

The Hazel McCallion Line will run above ground on a semi-exclusive guideway (segregated centre-running LRT) with some interaction with regular traffic. Traffic will only be permitted to cross the tracks at select locations, typically major streets with signalized intersections. At minor side streets, traffic will not be permitted to cross the tracks, either turning left or going straight through. U-turns will be permitted at some locations to maintain access to all locations.

Will traffic lanes be reduced along Hurontario once the LRT is in service?

What kind of vehicles will be used?

COVID-19

Why is Metrolinx moving ahead with new transit infrastructure in a time of low ridership and service? Won't COVID-19 concerns remove the need for more transit?

Throughout the pandemic, transit construction projects have been considered an essential service by the province therefore, construction has moved forward on all projects. We are aware that the new normal post-COVID may look very different for transit and we have begun looking very closely at all of our policies and procedures to ensure we adapt appropriately. As we move forward we know that building complete communities with good access to transit will continue to be important.

Project scope

How will the project replace trees and vegetation that has been removed?

Metrolinx and Mobilinx recognize that trees are very important and are working closely with the Cities of Mississauga and Brampton to help identify planting and compensation requirements for tree removal on both city and private property. An arborist is being engaged to ensure proper arboriculture techniques are employed prior to and during construction activities and to confirm the preservation or removal requirements for trees located on private property.

Will Hurontario be widened?

Accessibility related

Will the LRT have accessible features?

Yes, key accessibility features in all our LRT projects include:

- Tactile guidance tiles in stations and centre platform stops

- Enhanced intercoms that are accessible for customers who are hard of hearing (all intercoms) deaf and non-verbal (some intercoms)
- Elevator redundancy at interchange stations
- Audible and visual next stop announcement
- All-door boarding on vehicles

Related Projects

Hamilton LRT

14 kilometres of modern light rail transit running between McMaster University and Eastgate Square.

HAMILTON RAPID TRANSIT

Milton Line GO Expansion

More trips, more connections.

TORONTO REGION PEEL HALTON GO EXPANSION

Kitchener Line GO Expansion

We're transforming the Kitchener Line into a two-way, all-day rapid transit line.

PEEL TORONTO REGION GUELPH AND WELLINGTON HALTON WATERLOO GO EXPANSION

Lakeshore Expansior

Improvemer the Lakesho support mo service.

PEEL TOR(HAMILTON NIAGARA REG

Metrolinx, an agency of the **Ontario Government** under the Metrolinx Act, 2006, was created to improve the coordination and integration of transportation in the **Greater Toronto and Hamilton Area** alongside the **Ministry of Transportation**.

Dundas Connects Master Plan

MAY 24, 2018

V. DUNDAS CONNECTS RECOMMENDATIONS

CORRIDOR WIDE PROPOSED CONDITIONS

Legend

- Protected Multi-Use Trail
- Protected Cycle Track
- Hydro Underground Existing Location
- Hydro Aboveground Existing Location
- Focus Area

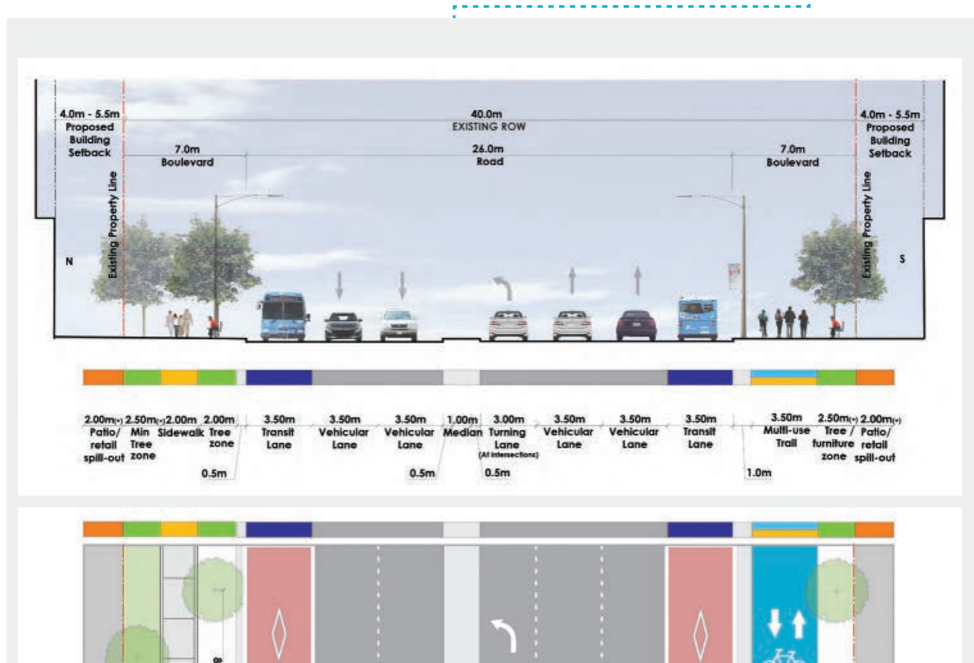
	CONDITION 1	CONDITION 2	CONDITION 3

	CONDITION 1	CONDITION 2	CONDITION 3
EXISTING PUBLICLY OWNED RIGHT-OF-WAY	Generally 40m	Generally 40m	Generally 30m
OFFICIAL PLAN DESIGNATED RIGHT-OF-WAY	42m / 35m	35m	35m / 30m
DUNDAS CONNECTS PROPOSED RIGHT-OF-WAY	42m / 40m	40m	35m
PROPOSED TRANSIT LOCATION	BRT CURBSIDE WITH MULTI-USE TRAIL	BRT CURBSIDE	BRT REVERSIBLE

CONDITION 1
West of Winston Churchill Boulevard:

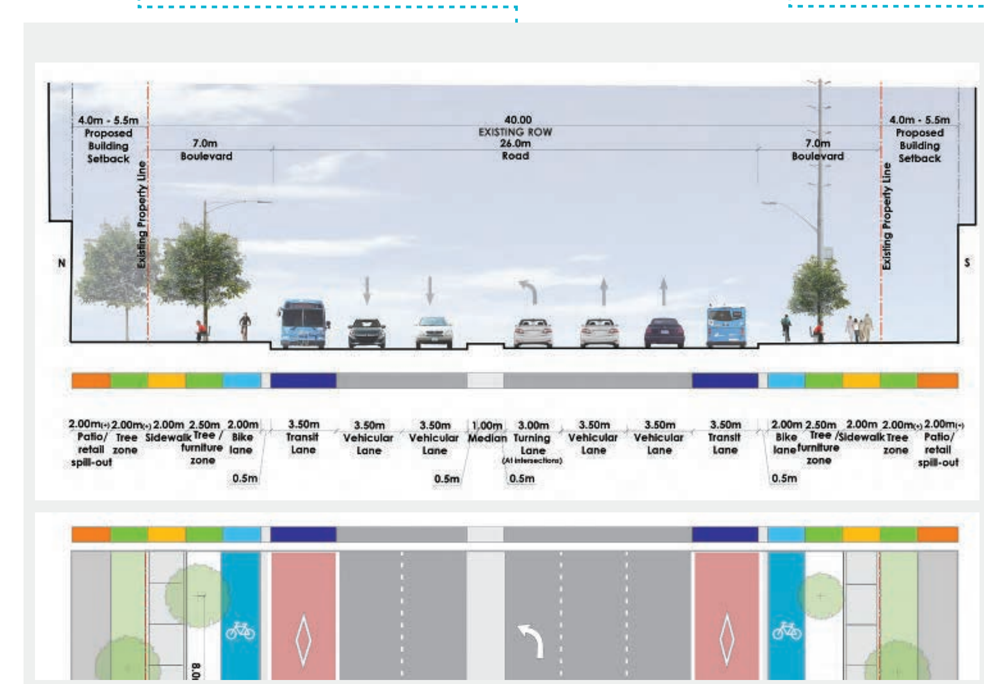
- Existing Right-of-Way generally 40m
- Existing 40m Right-of-Way to remain
- Roadway 26m
- Four vehicular lanes
- Two curbside transit lanes (assuming westerly extension to Oakville)

These cross sections represent a general condition of the corridor.



CONDITION 2
From Winston Churchill Boulevard to Mississauga Road:

- Existing Right-of-Way generally 40m
- Existing 40m Right-of-Way to remain
- Roadway 26m
- Four vehicular lanes
- Two curbside transit lanes



CONDITION 4

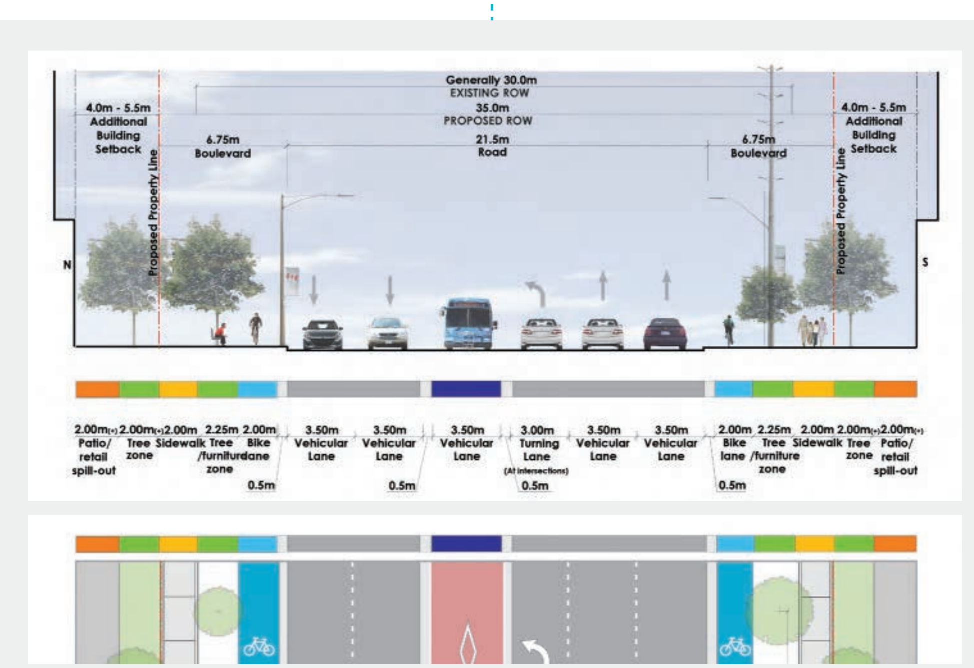
Figure 5-56.Recommended Corridor Design

Generally 40m

35m

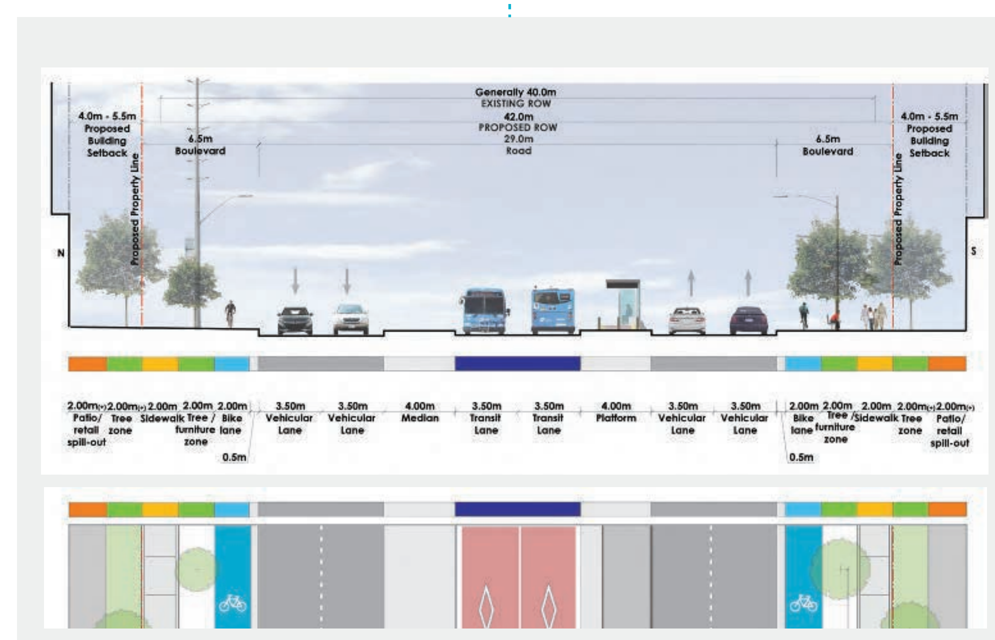
42m

BRT MEDIAN



CONDITION 3
From Mississauga Road to The Credit Woodlands:

- Existing Right-of-Way generally 30m
- Proposed Right-of-Way 35m
- Roadway 21.5m
- Four vehicular lanes
- One reversible transit lane



CONDITION 4
East of The Credit Woodlands:

- Existing Right-of-Way generally 40m
- Proposed Right-of-Way 42m
- Roadway 29m
- Four vehicular lanes
- Two median transit lanes

AECOM HuLRT - ROAD PLAN (FEB. 24, 2017) SCALE 1:1000 ROLL 1 of 3

AECOM HuLRT - ROAD PLAN (FEB. 24, 2017) SCALE 1:1000 ROLL 1 of 3

Hurontario LRT Benefits Case Analysis

Metrolinx

Report
March 2016

Our ref: 22861201
Client ref:

Key Modelling Assumptions

3.33 The alignment, journey time and headway assumptions of the proposed LRT and bus network were set out previously. In order to reflect improved quality and reliability offered to passengers by LRT in the HLRT corridor, in-vehicle time (IVT) factors were applied to the corridor buses and LRT as follows:

- 1.17 for corridor buses
- 1.02 for LRT

3.34 The result is that time spent in LRT is perceived to be 15% faster than conventional bus.

Ridership Forecasts

3.35 In 2031[4], with the introduction of HLRT, demand on transit routes on the Hurontario-Main corridor (19/103/2/502/LRT) increases from 20,100 in the Do Minimum to 28,700 boardings (42% increase) during the peak period, though a combination of mode shift from auto and transfer from other adjacent transit routes. Of the 28,700 with-LRT boardings, 22,550 are LRT boardings, with a further 6,150 boardings on the residual bus services on the corridor (the residual MiWay route 19 and the truncated Brampton Transit 2 and 502 routes to the north of Steeles).

3.36 LRT line boardings are shown in Table 3.5. The service pattern proposed requires an interchange for trips that travel beyond Downtown Mississauga; as shown in Table 3.5, around 1,100 trips make this transfer in the AM peak period.

Table 3.5: 2031 AM Peak Period LRT Demand and Boardings

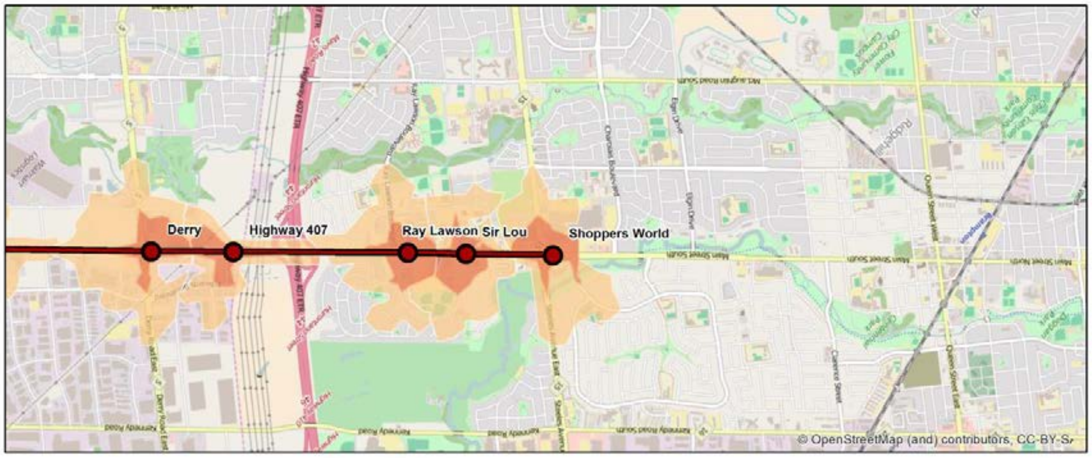
	Demand	Boardings
Brampton – Mississauga Downtown	9,600	10,700
Port Credit - Mississauga Downtown	10,700	11,800
Both lines	1,100	
Total AM Peak Period	**21,400**	**22,500**
Total Weekday	102,000	107,000
Total Annual	**30.4m**	**31.9m**

3.37 Figure 3.3 and Figure 3.4 shows the loading profile the in 2031 AM 1-hour peak hour, both by the service pattern and then by direction to give the overall picture for the LRT demand, which is forecast to remain within the planning capacity of the system. They also highlight the importance of Downtown Mississauga as a trip destination.

3.38 Downtown Mississauga is a major trip origin and destination. In addition, it connects other transits routes with stops at major intersections, landmarks, and transit centres. This is shown with high activities at the three GO Transit rail stations. The three highest LRT to transit transfer occurs at Port Credit, Mississauga Transitway, and Steeles stops.

[4] HOT model tests s32 for Do Minimum and s97 for LRT

Figure 4.3: 400m and 800m Catchment – Northern Section of LRT



Mode Share

4.25 The introduction of the HLRT is intended to produce a mode shift from road use to transit, by making transit use more attractive for trips using the Hurontario-Main Corridor. This is measured by the increase in transit's mode share. The Hurontario-Main Corridor runs through Mississauga and Brampton, and is intended to primarily serve trips with an origin and/or destination in the combined Mississauga-Brampton area.

4.26 The data on mode share is obtained from the transportation model, which produces estimates for trips specifically on the Hurontario-Main corridor, and more generally within the combined Mississauga-Brampton area. The figures for the weekday AM peak period in 2031 are shown in Table 4.4.

Table 4.4: Transit Mode Share (AM Peak 2031)

Scenario	Hurontario-Main Corridor	Within Mississauga-Brampton
Do Minimum	24%	13.60%
With HLRT	49%	14.00%
Change	***25%***	***0.40%***

4.27 The mode share results show that HLRT increases the transit mode share on the corridor substantially, from 24% to 49%. Across the wider Mississauga – Brampton area, the change is more modest as the much larger scale of demand across the area dilutes the impact of HLRT.

Integration with other transportation modes

4.28 "Mobility hubs" are areas identified by Metrolinx as being key nodes in the transit network where multiple modes and routes come together. They also have (or are expected to have) a high density of population, employment, or other services.

4.29 Metrolinx defined two types of Mobility Hubs: "Anchor Hubs are major transit station areas associated with an urban growth centre (as defined in the Province's Growth Plan for the Greater

APPENDIX H:

Background Development Excerpts

nexTrans
CONSULTING ENGINEERS

nextrans.ca

Transportation Impact Study Update

PROPOSED RESIDENTIAL DEVELOPMENT

King Street E and Camilla Road
MISSISSAUGA, ONTARIO

July, 2022
Project No: NT-21-042

Table 5 – 2028 Future Background Levels of Service

Intersection	Key Movement	Weekday AM Peak Hour			Weekday PM Peak Hour			Available Storage (m)
		LOS (v/c)	Delay (s)	Queue 95th (m)	LOS (v/c)	Delay (s)	Queue 95th (m)	
Hurontario Street/ King Street E (Signalized)	**Overall**	**E (1.07)**	**56**		**C (0.82)**	**29**		
	EB – L	F (0.90)	86	122	E (0.70)	65	49	35
	EB – T	E (0.49)	58	81	D (0.38)	51	69	>100
	EB – R	B (0.29)	13	21	B (0.18)	17	19	35
	WB – L	E (0.27)	70	21	D (0.19)	53	23	45
	WB – T	F (0.63)	82	60	E (0.78)	76	119	>200
	WB – R	A (0.24)	2	0	B (0.32)	15	24	45
	NB – L	F (0.85)	143	50	E (0.82)	71	84	60
	NB – T	C (0.57)	24	159	C (0.54)	22	153	>250
	SB – L	E (0.45)	75	45	B (0.28)	11	20	40
	SB – TR	E (1.07)	68	482	B (0.65)	19	199	>230
King Street E/ Camilla Road (Unsignalized)	EB – L	A (0.08)	9	--	A (0.13)	9	--	45
	EB – TR	A (0.25)	9	--	A (0.28)	10	--	100
	WB – LTR	B (0.30)	11	--	B (0.28)	11	--	>200
	NB – LTR	B (0.28)	10	--	B (0.32)	11	--	>200
	SB – TL	A (0.23)	10	--	A (0.22)	10	--	>200
	SB – TR	A (0.05)	6	--	A (0.06))	6	--	38
King Street E/ Donnavale Drive (Unsignalized)	EB – TR	A (0.16)	0	0	A (0.10)	0	0	>200
	WB – TL	A (0.00)	0	0	A (0.00)	0	0	>200
	NB – LR	B (0.03)	11	1	B (0.01)	10	0	>200

5.0 SITE TRAFFIC

5.1. Proposed Development

As indicated, the proposed development consists a total of 24 residential dwelling units, with 9 freehold and 15 condo units. A condominium road will be provided onto Camilla Road, south of King Street E to accommodate the proposed 15 condo units. The proposed development will provide a total of four visitor parking spaces (including one barrier free space) within the proposed private condominium road to accommodate the proposed 15 condo units.

The 2016 Transportation Tomorrow Survey (TTS) and the *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE) and information was reviewed to estimate the modal split, trip distribution and trip generation for the proposed development.

5.2. Modes of Travel Assessment in the Area

Table 4 summarizes the travel mode split information based on the review of the 2016 Transportation Tomorrow Survey data for Traffic Zones 3632 and 3653, based on low-rise residential units. The 2016 TTS data extraction is included in **Appendix F**.

Table 6 – Modal Split based on 2016 TTS Data for Traffic Zones

Time	Trips Made by Traffic Zones				
	Auto Driver	Auto Passenger	Transit	Cycle	Walk
AM Peak Period (6:00Am – 9:00AM)	73%	14%	8%	3%	2%
PM Peak Period (4:00PM – 7:00PM)	79%	10%	7%	2%	2%

Based on the information above, the non-auto mode of transportation (transit + walking + carpooling) accounts for 27% during the morning peak period and 21% during the afternoon peak period.

5.3. Site Trip Generation

The trip generation forecasts were undertaken using the information contained in the *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE). For the purposes of this assessment, the ITE Land Use Code (LUC) 210 "Single-Family Detached Housing General Urban/Suburban" fitted curve equations has been utilized for the proposed development.

To be conservative, no modal split has been assumed for the proposed development. The site trip generation is summarized in **Table 7**.

Table 7 – Site Trip Generation

ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Single-Family Detached Housing LUC 210 General Urban/Suburban	24 units	Trip Rates AM - T = 0.71(X) + 4.80 PM - Ln(T) = 0.96Ln(X) + 0.20	0.23	0.69	0.92	0.68	0.4	1.08
		Total Trips	6	16	22	16	10	26

Based on the analysis noted above, the proposed development is expected to generate 22 total two-way trips (6 inbound and 16 outbound) and 26 total two-way trips (16 inbound and 10 outbound) during the AM and PM peak hours, respectively.

5.4. Site Trip Distribution and Assignment

The 2016 Transportation Tomorrow Survey (TTS) data was reviewed for Traffic Zones 3632 and 3653 in order to estimate the general trip distribution for the proposed development. **Table 8** summarizes the planning district/traffic zones distribution based on the 2016 TTS data, with **Table 9** summarizing the site trip assignment based on the 2016 TTS data detailed and existing transportation network in the area.

Table 8 – Trip Distribution for Residential Component

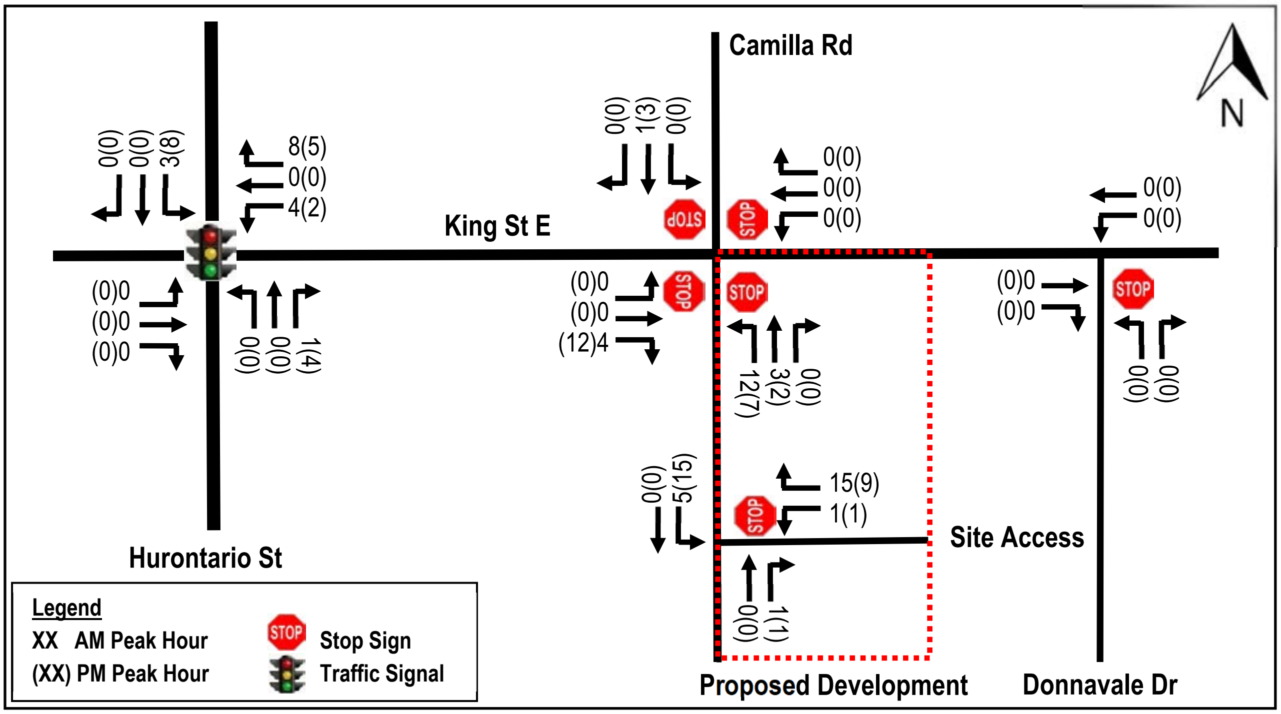
Mode	Mississauga	Toronto	Brampton	Oakville	Other (west)	Total
Auto	51%	40%	1%	5%	0%	100%
Transit	54%	46%	0%	0%	0%	100%

Table 9 – Site Trip Distribution

General Direction (To/From)	Auto	Transit
North (Hurontario, Camilla)	50%	54%
South (Hurontario, Camilla)	1%	0%
East (via Dundas, Queensway, QEW, King St E)	40%	0%
West (via Dundas, Queensway, QEW, King St E)	9%	46%
Total	***100%***	***100%***

Figure 12 illustrates the proposed development generated traffic volumes. It should be noted that the auto site trip distribution and assignment have been taken into consideration the 2016 TTS information, existing turning restrictions (if any), existing intersection operations and capacity constraints.

Figure 11 – Site Traffic Volumes

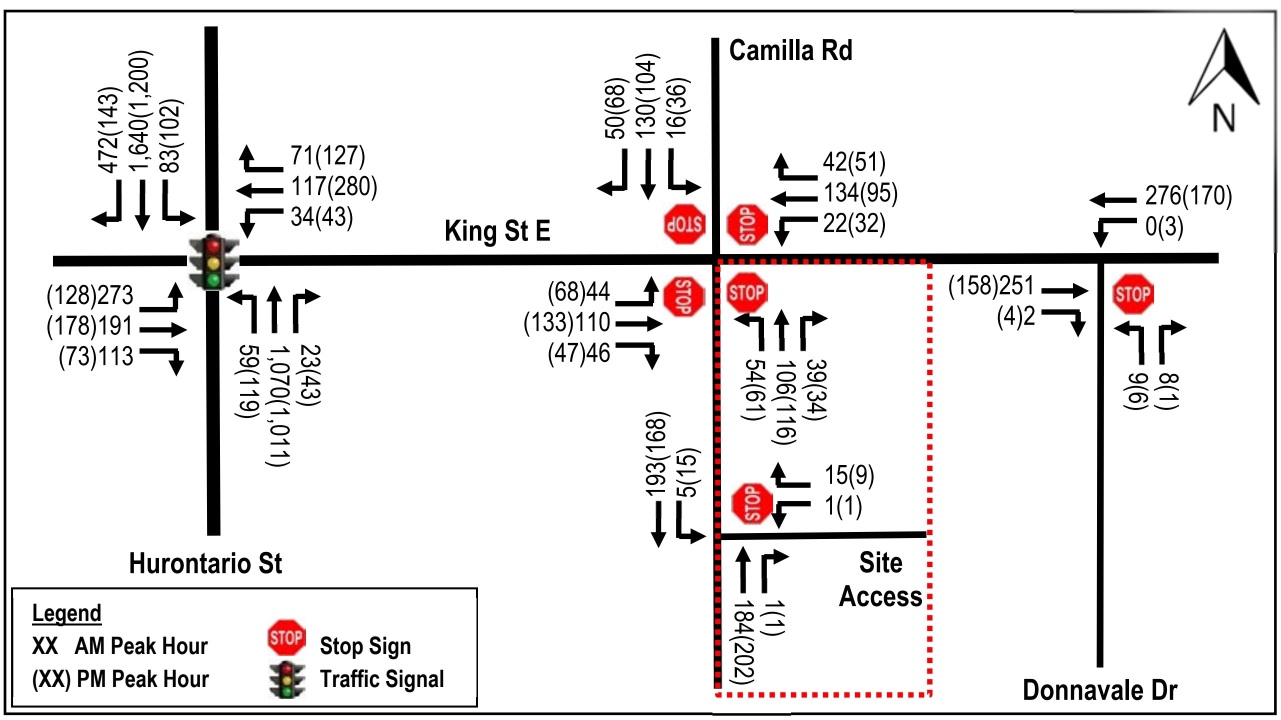


6.0 FUTURE TOTAL TRAFFIC CONDITIONS

6.1. Future Total Traffic Assessment for Auto Mode

The estimated 2026 future total traffic volumes (future background traffic volumes plus site generated traffic volumes) are illustrated in **Figure 12**, and were analyzed using Synchro Version 10 software. The detailed calculations are provided in **Appendix G** and summarized in **Table 10**.

Figure 12 – 2028 Future Total Traffic Volumes



BA Group

25 Hillcrest Avenue & 3154 Hurontario Street City of Mississauga

Mixed Use Development
Urban Transportation Considerations

Prepared For: 33HC TAS LP, 33HC Corp., 3168HS LP and 3168HS Corp

May 2022

2.0 PROPOSED DEVELOPMENT

2.1 DEVELOPMENT USES

The proposed development includes five (5) mixed-use buildings comprising the following uses:

- **Building A:** 491 residential units and 1,202 square metres of retail GFA
- **Building B:** 482 residential units and 2,284 square metres of retail GFA
- **Building C:** 444 residential units, 1,086 square metres of retail GFA, and 8,692 square metres of commercial GFA
- **Building D**: 440 residential units and 1,304 square metres of retail GFA
- **Building E:** 367 residential units, 394 square metres of retail GFA, and 6,216 square metres of community GFA

In total, the proposed plan includes 2,224 residential units (mix of market and affordable units), 6,270 square metres of retail GFA, 8,692 square metres of commercial GFA, and 6,216 square metres of community GFA.

The proposed plan is outlined in **Table 1** and illustrated in **Figure 3**. Reduced scale architectural plans are provided in **Appendix A** for reference.

TABLE 1 DEVELOPMENT PROPOSAL

Use		Proposed Development
Residential		1,592 1-Bedroom Units 524 2-Bedroom Units 108 3-Bedroom Unit 2,224 Total Units
Retail		6,270 square metres
Commercial		8,692 square metres
Community		6,216 square metres
Transportation Elements	Vehicle Parking Supply	1,994 spaces (1,452 residential and 542 shared visitor / non-residential spaces)
	Bicycle Parking Supply	2,189 spaces (1,914 long-term spaces and 275 short-term bicycle rings)
	Loading Supply	11 loading spaces
	Site Access	Via east-west Private Road off GO Access Road and north-south Private Road off Hillcrest Avenue and John Street
	Vehicle Parking Access	Via driveway off Private Roads at Buildings A and C
	Bicycle Parking Access	Via elevator at lobby (long-term and short term) and open access at-grade (short-term)
	Loading Access	Via driveway off Private Roads at each building

Notes:
1. Latest site statistics from SvN Architects and Planners received on May 30, 2022.

10.3 SITE TRAFFIC VOLUMES

10.3.1 Existing Site Traffic Volumes

The existing site consists of several retail uses and 390 surface parking spaces that serve the GO station. With the proposed redevelopment, the vehicular traffic to and from these uses will be removed from the area road network. There are 320 and 460 existing site trips during the weekday morning and afternoon peak hours, respectively, as summarized in **Table 32**.

TABLE 32 EXISTING SITE TRAFFIC VOLUMES

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Retail Site Trips	15	15	30	120	130	250
GO Parking Site Trips	275	15	290	40	170	210
Total Existing Site Trips (To Be Removed)	**290**	**30**	**320**	**160**	**300**	**460**

Notes:
1. All site trips are rounded to the nearest five (5).

10.3.2 Total Site Traffic Volumes

As previously discussed in **Section 9.6**, the site is expected to generate 885 and 830 two-way vehicle trips during the weekday morning and afternoon peak hours, respectively. These vehicle trips are summarized in **Table 33**.

TABLE 33 TOTAL SITE TRAFFIC VOLUMES

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Residential	45	460	505	285	160	445
Retail	110	95	205	120	120	240
Office	110	10	120	0	85	85
Community	40	15	55	30	30	60
Total	**305**	**580**	**885**	**435**	**395**	**830**

Notes:
1. All site trips are rounded to the nearest five (5).

It is noteworthy that a portion of the total retail trips are assumed to be pass-by trips, consistent with the data provided in the ITE Trip Generation Handbook, 3rd Edition (dated September 2017). The pass-by percentage, which was found to be dependent on retail gross leasable area, is approximately 43%. The breakdown of retail trips is summarized in **Table 34**.

Table 34 Retail Pass-by and Primary Site Traffic Volumes

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Retail	110	95	205	120	120	240
Pass-by (43%)	*45*	*45*	*90*	*55*	*55*	*110*
Primary	*65*	*50*	*115*	*65*	*65*	*130*

10.3.3 Net New Site Traffic Volumes

Relative to existing conditions, the site redevelopment will generate an additional (or "net new") 565 and 370 two-way vehicle trips during the weekday morning and afternoon peak hours, respectively.

Table 35 Net New Site Traffic Volumes

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Existing Site Trips (To Be Removed)	290	30	320	160	300	460
Total Site Trips	305	580	885	435	395	830
Net New Site Trips	**15**	**550**	**565**	**275**	**95**	**370**

Notes:
1. All site trips are rounded to the nearest five (5).

10.3.4 Site Traffic Volume Figures

Figure 13, **Figure 14**, **Figure 15** and **Figure 16** illustrate the residential, retail, office, and community centre site traffic volumes on the study area road network, respectively.

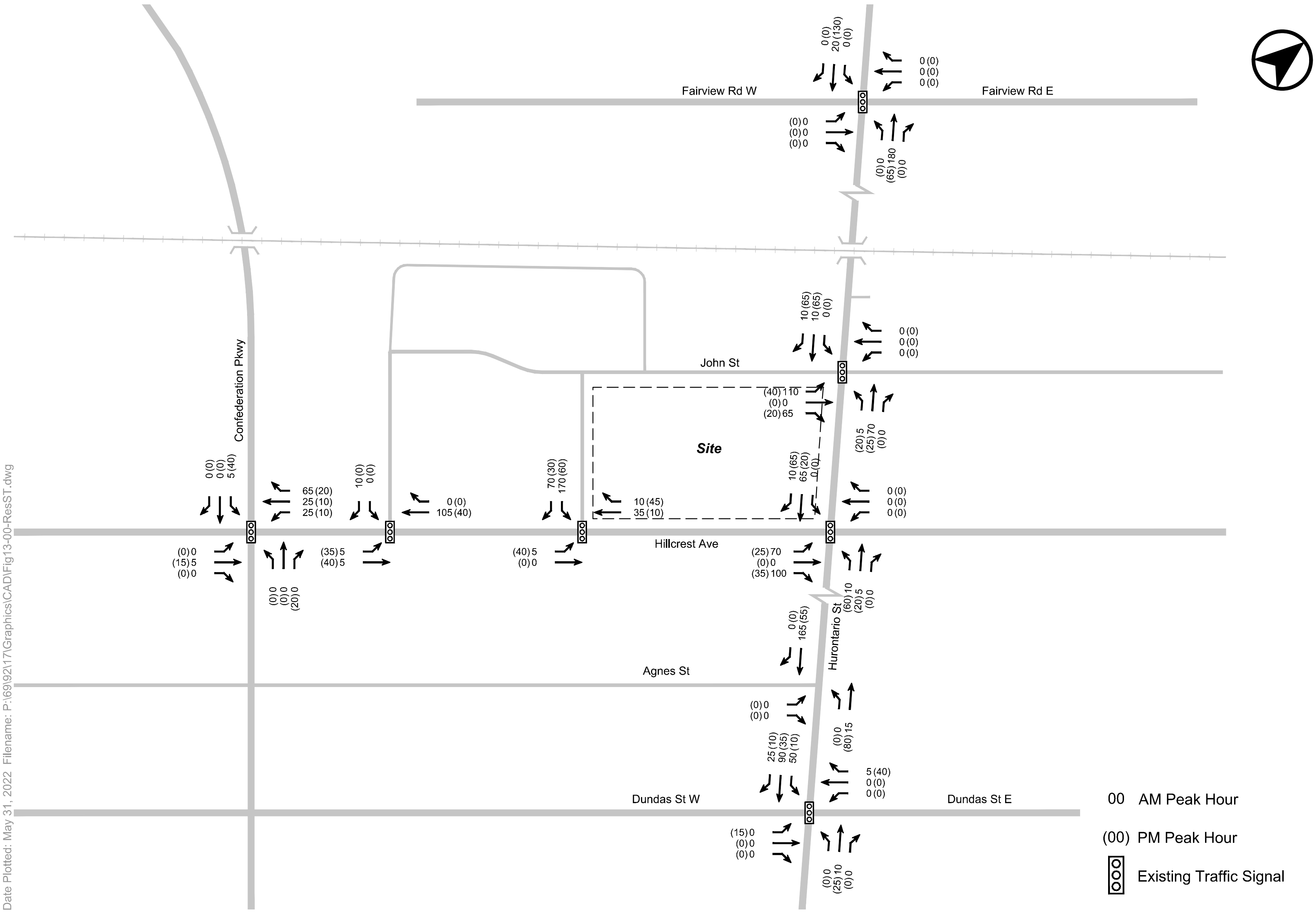
Figure 17 and **Figure 18** illustrate the total and net new site traffic volumes on the study area road network, respectively.

10.3.5 Site Trip Distribution

10.3.5.1 Residential Trip Distribution

Residential vehicle site trips were assigned onto the area road network based upon a review of travel information provided by the 2016 Transportation Tomorrow Survey (TTS) for home-based trips in the site environs. The TTS queries are provided in **Appendix I**.

The residential site traffic distribution is summarized in **Table 36**.



Date Plotted: May 31, 2022 Filename: P:\69\92\17\Graphics\CAD\Fig13-00-ResST.dwg

FIGURE 13 RESIDENTIAL SITE TRAFFIC VOLUMES - EXTERNAL

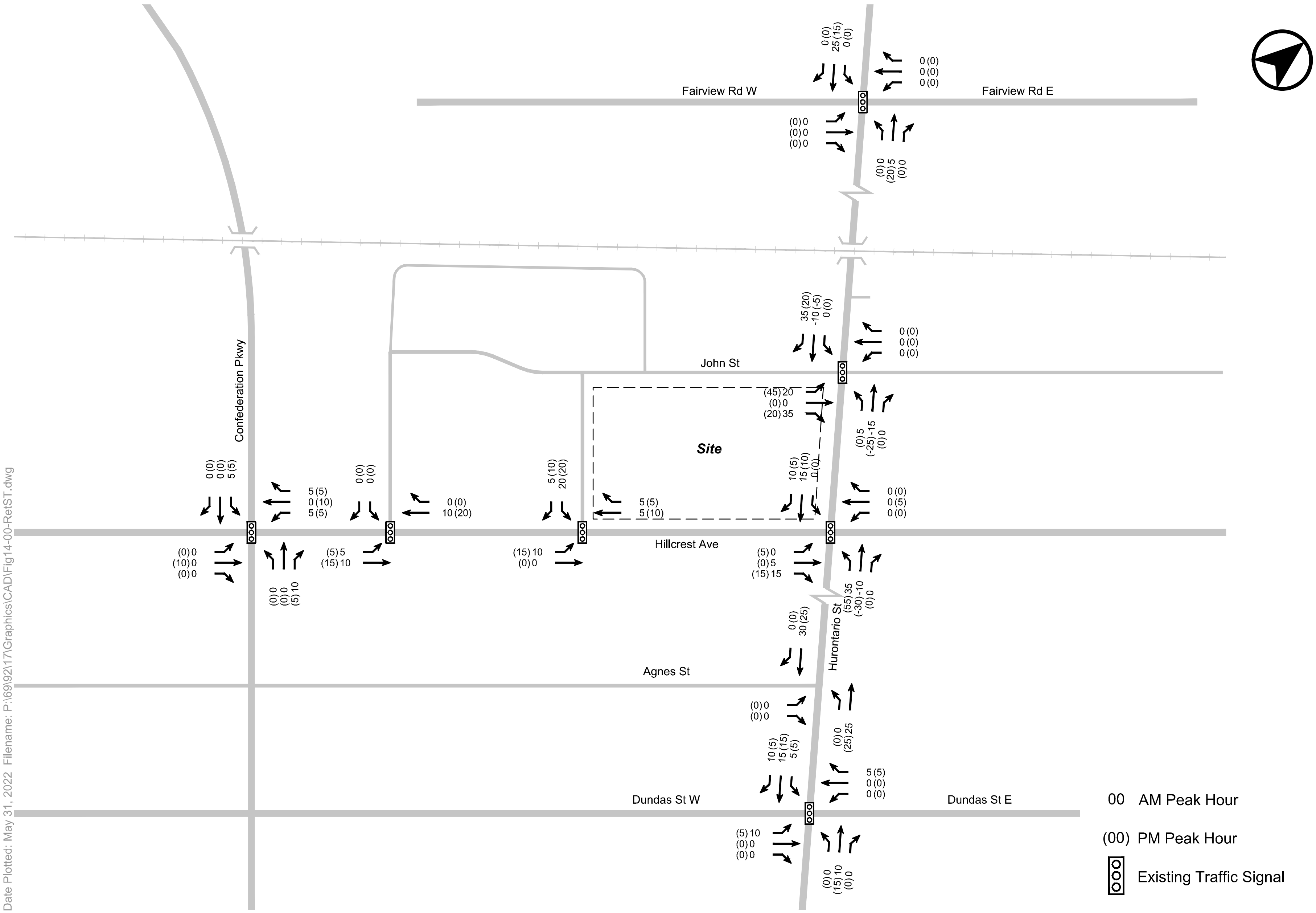


FIGURE 14 RETAIL SITE TRAFFIC VOLUMES - EXTERNAL

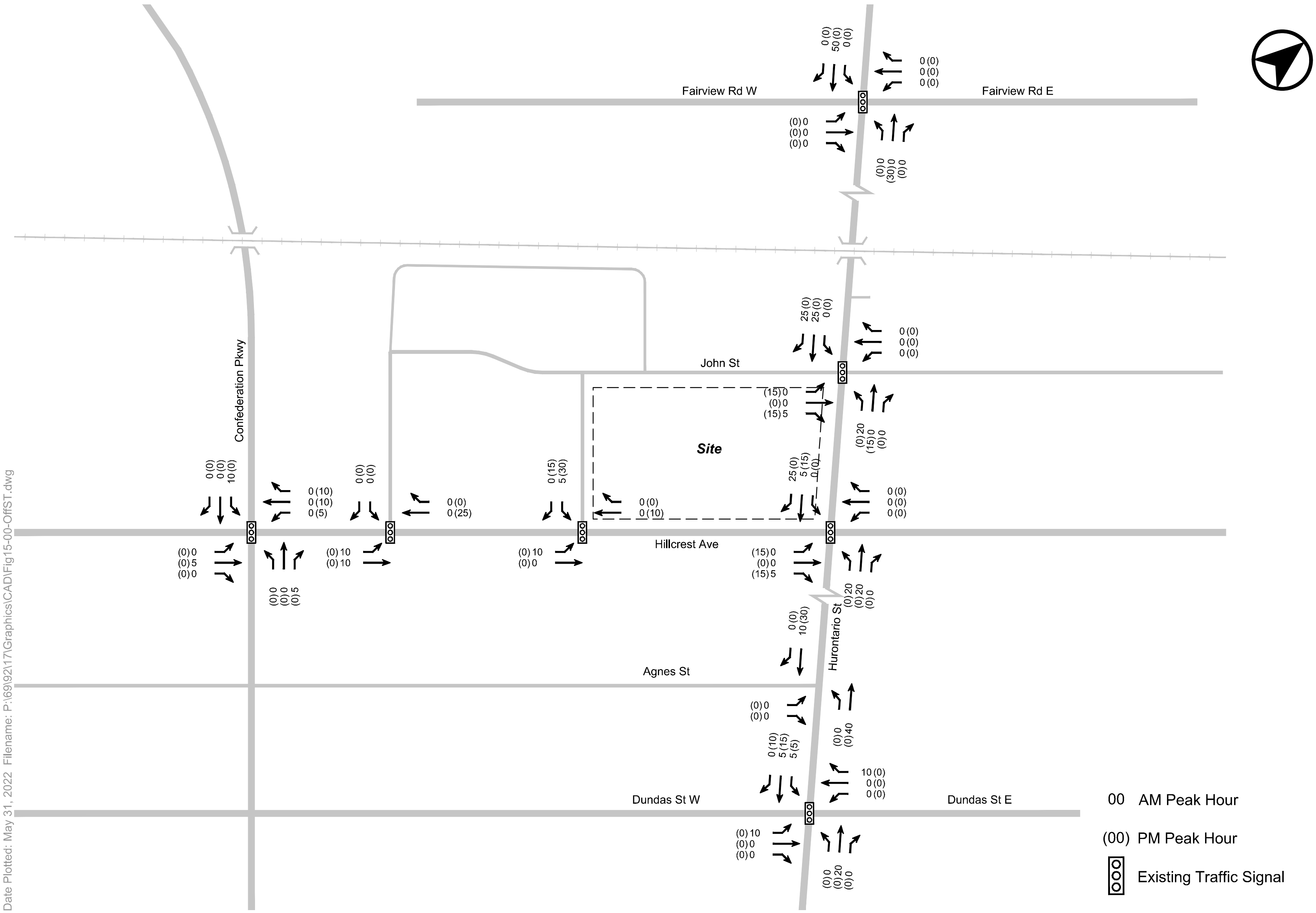


FIGURE 15 OFFICE SITE TRAFFIC VOLUMES - EXTERNAL

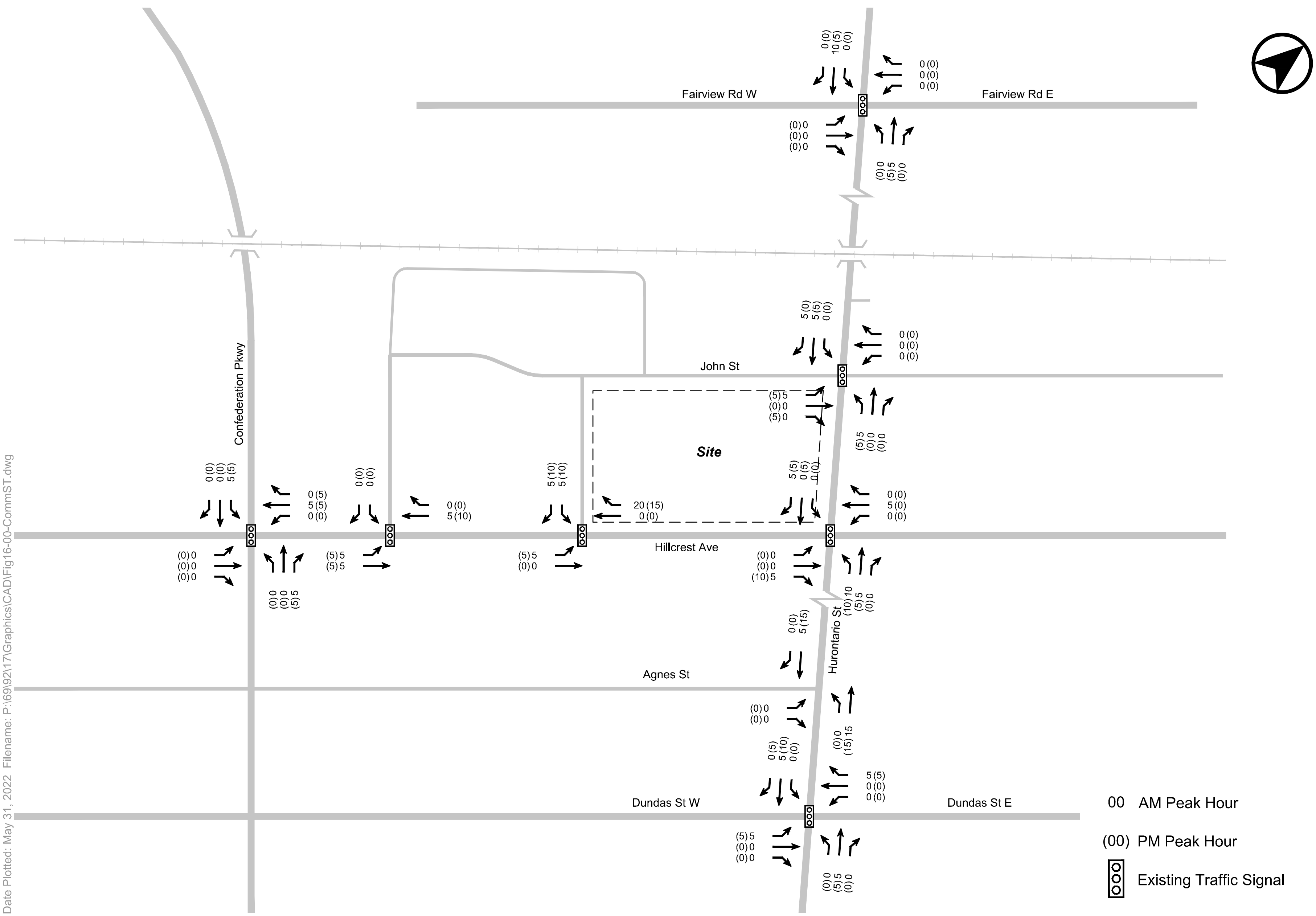


FIGURE 16 COMMUNITY CENTRE SITE TRAFFIC VOLUMES - EXTERNAL

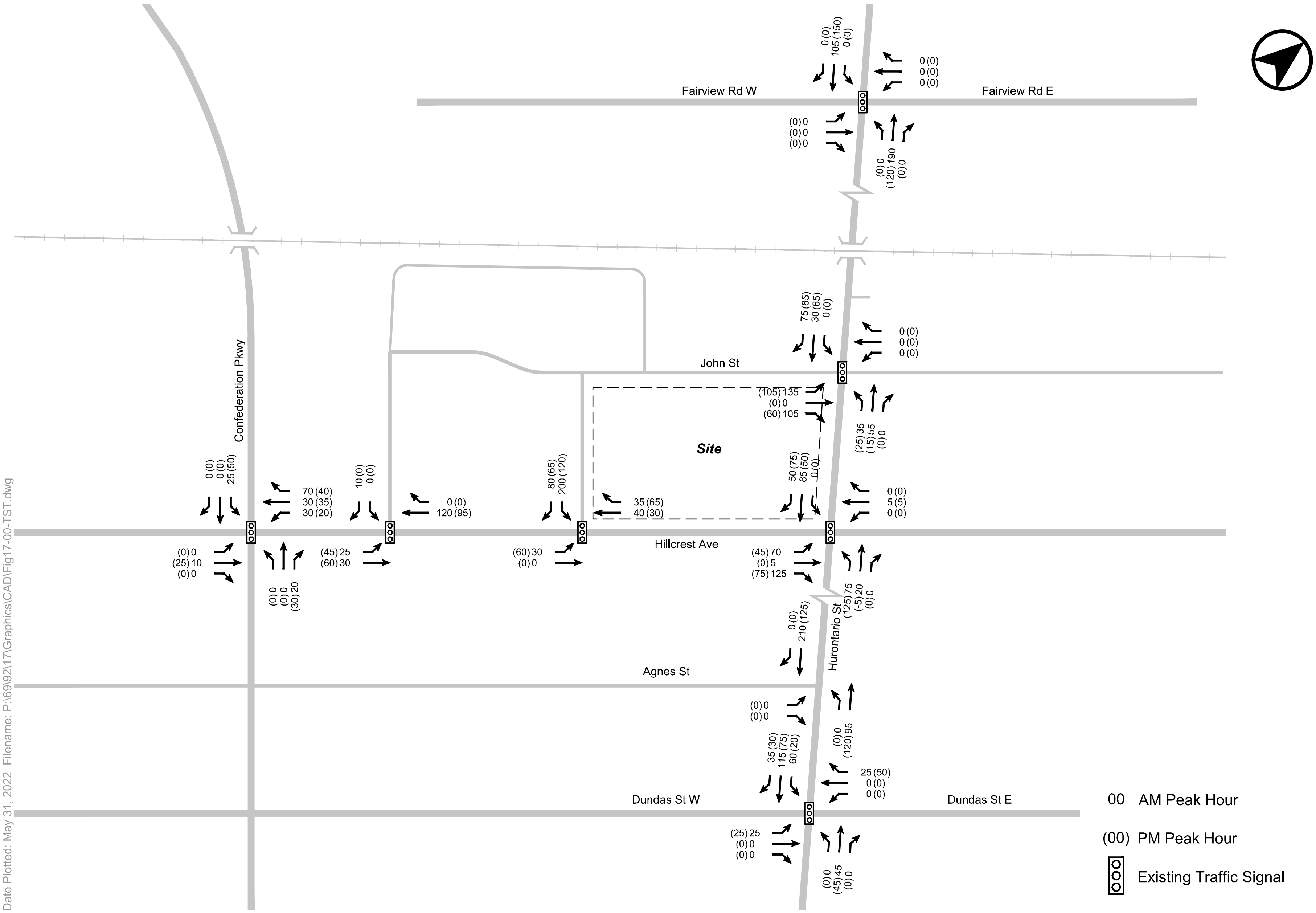


FIGURE 17 TOTAL SITE TRAFFIC VOLUMES - EXTERNAL

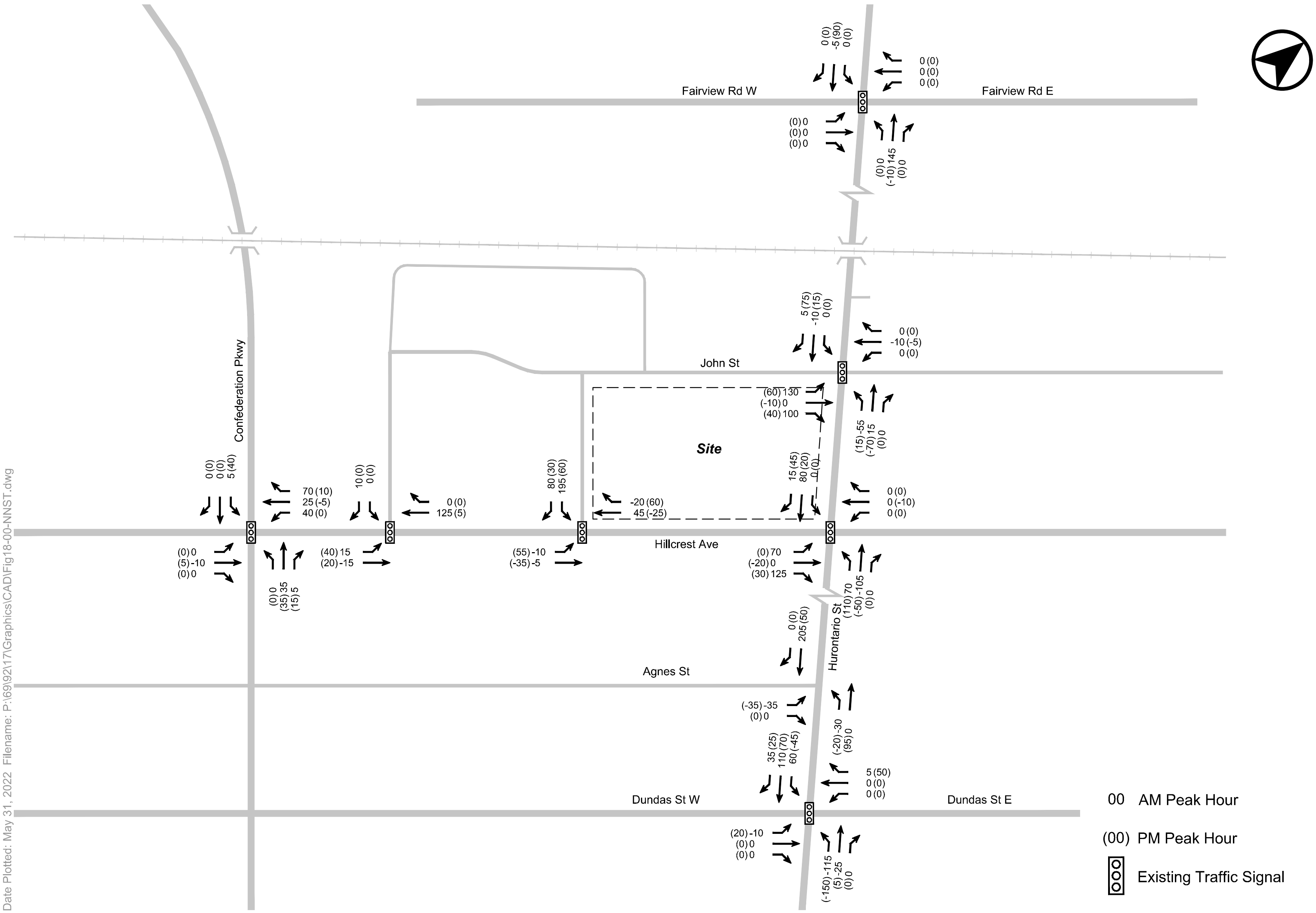


FIGURE 18 NET NEW SITE TRAFFIC VOLUMES - EXTERNAL

BURNSIDE

60 Dundas Street East
Transportation Study

Almega Asset Management

60 Dundas Street East Transportation Study

Almega Asset Management

R.J. Burnside & Associates Limited
1465 Pickering Parkway Suite 200
Pickering ON L1V 7G7 CANADA

March 2022
300053263.0000

4.0 Proposed Development

According to the site plan by Chamberlain Architects, dated January 13, 2022, the proposed development will consist of 1,224 apartments and 847 m^2 (9,117 ft^2) of ground floor retail. Access will be provided by one full movement driveway on Dundas and one full movement driveway on Shepard Avenue. The site plan is shown in Figure 9.

Figure 9: Site Plan

driveways only. Pass-by rates for retail uses were derived based upon experience and information published in the ITE Trip Generation Handbook, 3rd Edition. A pass-by rate of 35% was applied to the weekday PM peak hour. There was no available pass-by data for the weekday AM peak hour and; therefore, no reductions were considered.

The resulting trip generation is summarized in Table 5.

Table 5: Site Trip Generation

Land Use (Size)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Multifamily Housing -High Rise (LUC 222) – 1,224 units						
Total Trips	112	218	330	220	172	392
Non-Vehicle Modal Split (8%)	-9	-17	-26	-17	-14	-31
New Trips Subtotal	*103*	*201*	*304*	*203*	*158*	*361*
Strip Plaza (LUC 822) – 9,117 ft^2						
Total Trips	16	11	27	37	36	73
Non-Vehicle Modal Split (8%)	-1	-1	-2	-3	-3	-6
Pass-by (AM 0%, PM: 40%)	0	0	0	-12	-12	-24
Interaction (25%)	-4	-2	-6	-9	-8	-17
New Trips Subtotal	*11*	*8*	*19*	*13*	*13*	*26*
Total New Trips	**114**	**209**	**323**	**216**	**171**	**387**

4.2 Trip Distribution and Assignment

Trip distribution and assignment of site trips were based upon existing traffic patterns, the available road network, and a review of TTS data. The estimated distribution for residential and retail trips is summarized in Table 6.

Table 6: Trip Distribution

To/From	Via	Inbound / Outbound Distribution	
		Residential	**Retail**
North	Hurontario Street	35%	20%
South	Hurontario Street	30%	20%
East	Dundas Street	15%	30%
West	Dundas Street	20%	30%
	Total	**100%**	**100%**

The resulting pass-by trips and total site traffic trips are shown in Figure 10 and Figure 11, respectively.

Figure 10: Pass-By Traffic Volumes

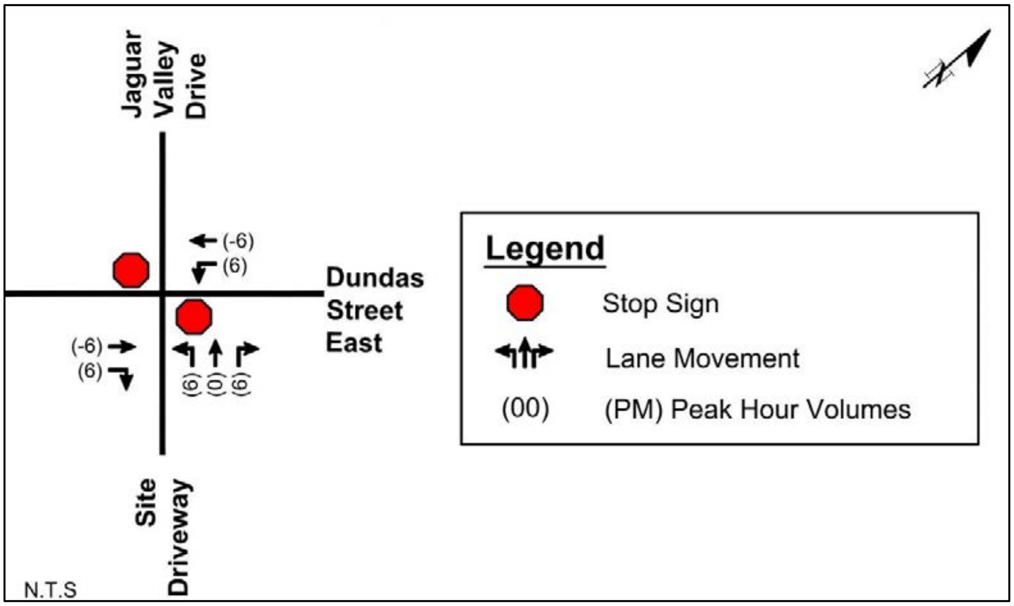
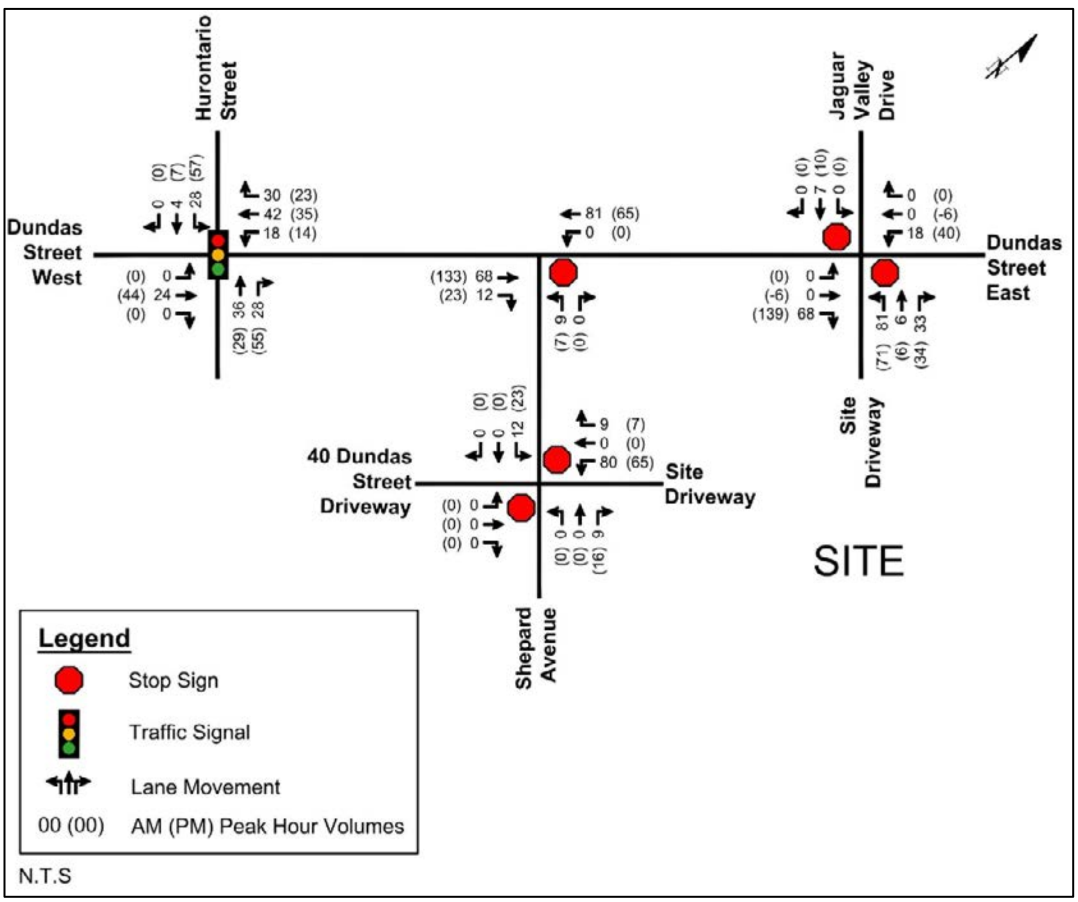


Figure 11: Total Site Traffic Volumes



Traffic Impact Study

Proposed Residential Development

65 & 71 Agnes Street
City of Mississauga, ON

UT-21-032

April 28, 2022

Hurontario Street & Dundas Street West (Signalized)

The intersection capacity analysis indicates that under the future (2027) background traffic conditions, the intersection is expected to operate at acceptable levels of service, v/c ratios and delay, with the exception of westbound through-right movements operating with higher delay and 1.00 v/c ratio during the afternoon peak hour period.

Agnes Street & Hurontario Street (Unsignalized)

The intersection capacity analysis indicates that under the future (2027) background traffic conditions, the intersection is expected to operate at acceptable levels of service, v/c ratios and delay with no critical movements identified.

Cook Street & Agnes Street (Unsignalized)

The intersection capacity analysis indicates that under the future (2027) background traffic conditions, the intersection is expected to operate at acceptable levels of service, v/c ratios and delay with no critical movements identified.

4.0 SITE GENERATED TRAFFIC VOLUMES

4.1 Proposed Development

The subject site is currently occupied by two (2) single family detached residential dwellings. Based on the site plan provided by Sweeny & Co Architects dated April 22, 2022, we understand the project consists of the following components:

- Redevelop the subject property with a 29-storey residential condominium building consisting of 379 residential units including six (6) townhouse residential units.
- A total of 412 parking spaces are proposed within five (5) levels above grade and two (2) underground parking levels comprising of 57 visitor parking spaces and 355 tenant parking spaces.
- A full movement vehicular entrance is proposed via Agnes Street.

4.2 Non-Auto Modal Split

UrbanTrans reviewed the 2016 Transportation Tomorrow Survey Data Ward 7, in the City of Mississauga. **Table 6** summarizes the non-auto modal split information catered to the proposed development and provided in **Appendix H**.

Table 7: Site Traffic Trip Generation

Land Use (Magnitude)		Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) 373 Units	Gross Trip Rate	0.08	0.23	0.31	0.22	0.14	0.36
	Gross Trips	28	89	117	82	53	135
	Transit Reduction (25%)	7	22	29	21	13	34
	New Trip Rate	0.06	0.18	0.24	0.16	0.11	0.27
	New Trip	21	67	88	61	40	101
Multifamily Housing (Low-Rise) 6 Units	Gross Trip Rate	0.00	0.01	0.01	0.01	0.00	0.01
	Gross Trips	1	2	3	3	2	5
	Transit Reduction (25%)	0	1	1	1	0	1
	New Trip Rate	0.00	0.01	0.01	0.01	0.00	0.01
	New Trip	1	1	2	2	2	4
Total New Trips		**22**	**68**	**90**	**63**	**42**	**105**

Based on the trip generation calculations, the proposed residential development is estimated to generate a total 90 two-way trips (22 inbound and 68 outbound) during the weekday morning peak hour and 105 two-way trips (63 inbound and 42 outbound) during the afternoon peak hour.

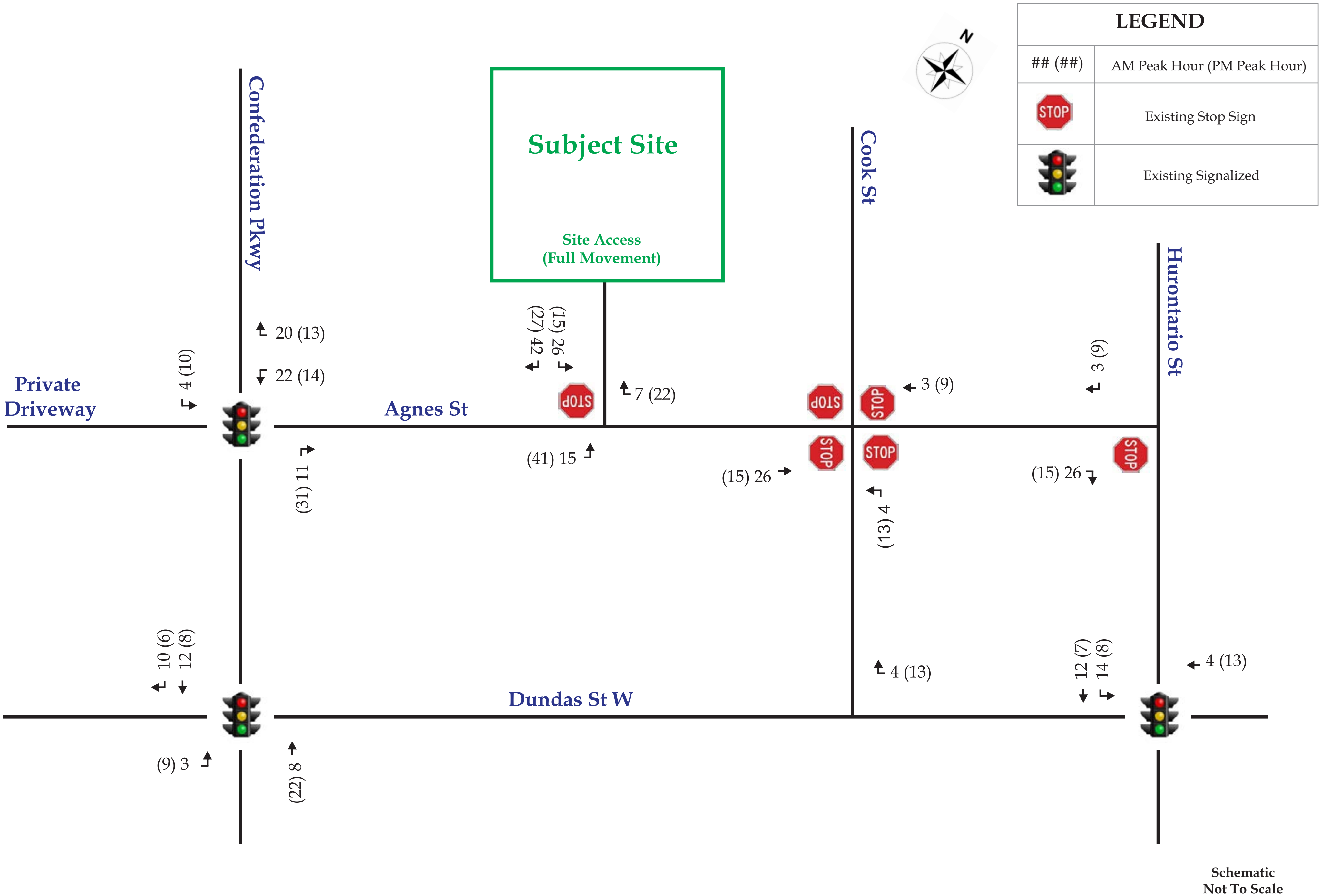
4.4 Trip Distribution and Trip Assignment

The trips generated by the proposed development were distributed to and from the boundary road network based on the 2016 Transportation Tomorrow Survey (TTS) data. Trip distribution was conducted for the traffic zones 3863, 3862, 3871, and 3872, which are located in the City of Mississauga. The TTS data detailing the trip distributions are provided in **Appendix I.** The site generated trips were distributed to the study intersections based on the TTS data and engineering judgement.

The overall distribution of trips to the study area intersections are summarized in **Table 8**. **Table 9** summarizes distribution of trips based on each study intersection and is illustrated in **Figure 8.**

Table 8: Trip Distribution (Overall)

Direction	To/From Proposed Development
North	30%
South	35%
East	20%
West	15%



URBANTRANS Engineering Solutions Inc.

65-79 Agnes Street, City of Mississauga ON
Project No. UT-21-032
April 2022

Figure 8 - Site Generated Traffic Volumes

DVB Real Estate Investments Inc.

3016-3032 KIRWIN AVENUE

Transportation Impact Study Update

December 2022

21111

Table 1-1: Preliminary Site Statistics

Land Use	Unit Count	Unit Mix
Residential		
1-Bedroom	113	76%
2-Bedroom	32	22%
3-Bedroom	3	2%
Residential Total	**148**	**100%**
Proposed Number of Parking and Loading Spaces On-Site		
Residential Parking	151	
Visitor Parking	21	
Bicycle Parking	115	
Loading Space	1	

Figure 1-1: Site Plan (Source: KFA Architects + Planning Inc., dated October 11, 2022)

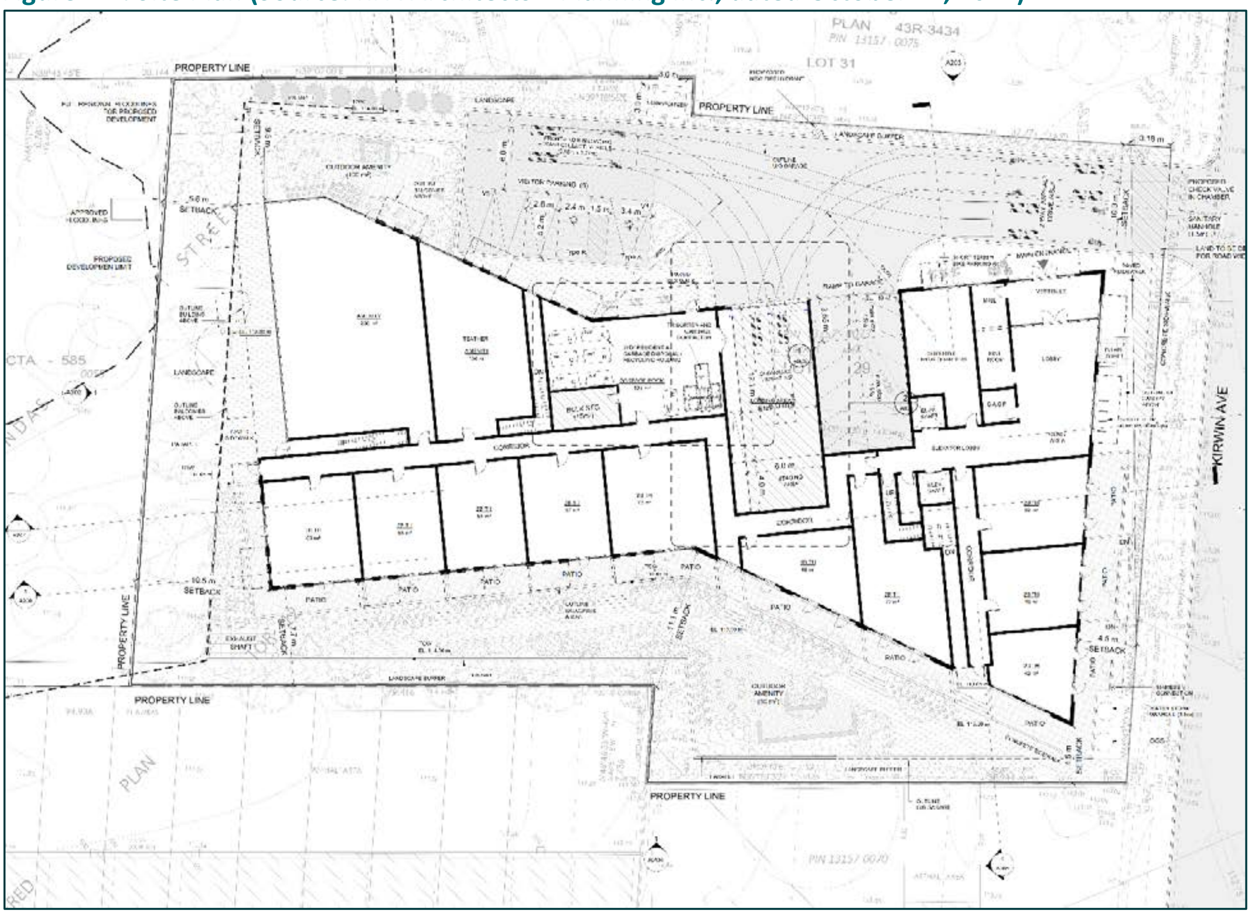


Table 3-4: Future Background Unsignalized Intersection Capacity Analysis

Intersection	Movement	AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Kirwin Avenue and Plaza Access	WBLR	5	566	11.4	0.2	0.01	B
	SBL	4	1324	0.1	0.1	0.00	A
Intersection	**Movement**	**PM Peak Hour**					
		Flow Rate (vph)	**Capacity (vph)**	**Control Delay (s)**	**95th Queue (m)**	**V/C**	**LOS**
Kirwin Avenue and Plaza Access	WBLR	46	362	16.4	3.3	0.13	C
	SBL	7	972	0.3	0.2	0.01	A

As shown in **Table 3-4**, under future background conditions, the unsignalized intersections are generally expected to operate with acceptable levels of service, similar to the existing conditions. There were no other constraints identified, and residual capacity is present for all movements.

4 SITE GENERATED TRAFFIC

4.1 SITE TRIP GENERATION

The current site plan provided by DVB Real Estate Investments Inc. contains a total of 148 residential units in an eight (8) storey mid-rise rental apartment building. Trip generation rates for the residential component have been updated using the latest available ITE Trip Generation Manual 11th Edition rates for the land-use code 221 (Multifamily Housing – Mid-Rise). The number of units was rounded up to 150 units for a conservative estimate.

The proposed development is expected to generate 54 trips in the AM peak hour (12 inbound, 42 outbound) and 59 trips in the PM peak hour (36 inbound, 23 outbound). The residential trip generation calculations for the proposed development, and the development located within the site area can be found in **Table 4-1**.

Table 4-1: Site Trip Generation

Land Use		Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
150 Units - Residential (ITE Code 221)	Fitted Curve Equation	T = 0.44 (X) - 11.61			T = 0.39 (X) + 0.34		
	Directional Distribution	23%	77%	100%	61%	39%	100%
	Trips Generated for Units	12	42	54	36	23	59

4.2 SITE TRIP DISTRIBUTION AND ASSIGNMENT

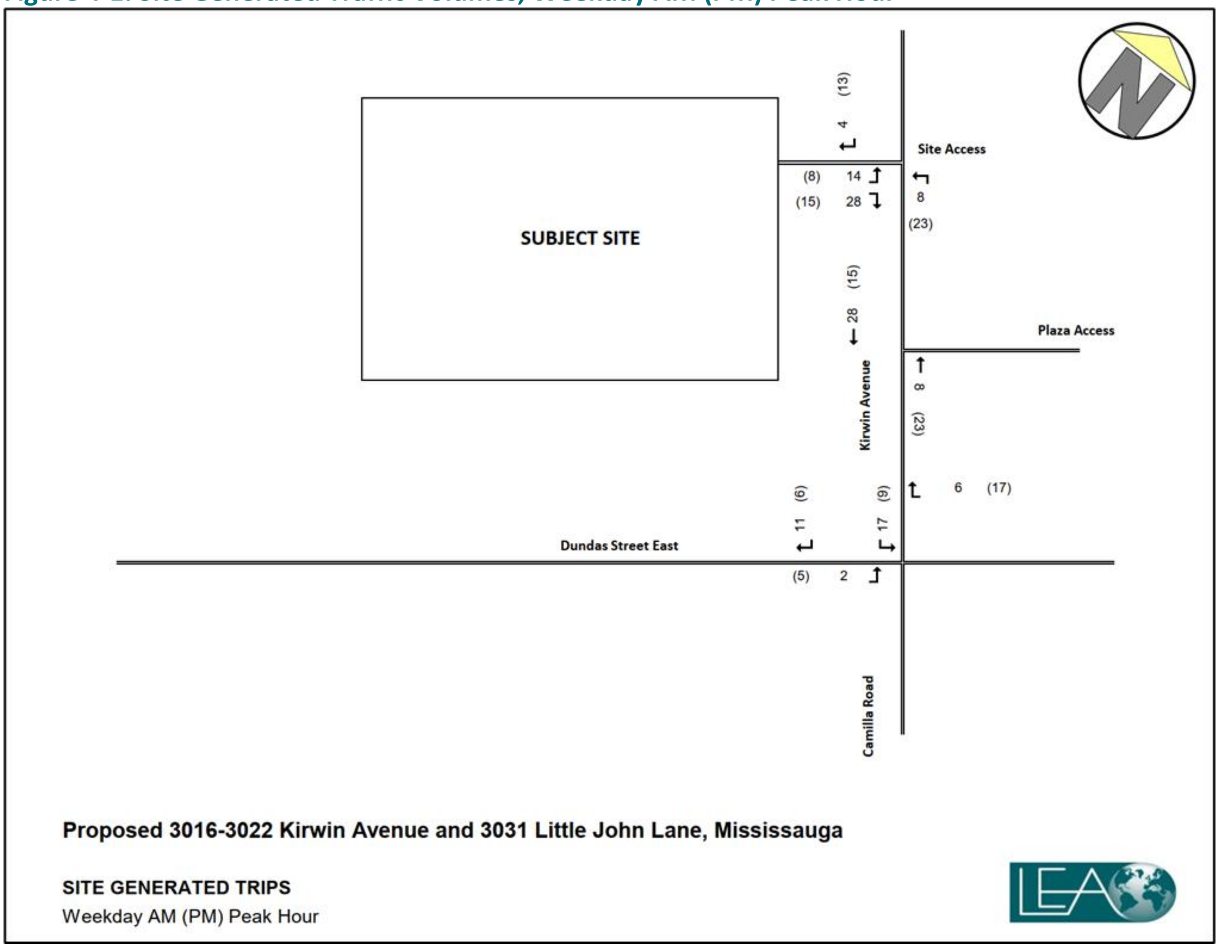
Trip distribution of site traffic for the residential development was estimated using the 2016 Transportation Tomorrow Survey (TTS) data. It is expected that most auto trips originating from the subject site will be traveling to the destination of work during the weekday AM peak hour. For the weekday PM peak hour, most residential auto trips will be traveling from the place of work to the subject site. Therefore, the trip distribution for the residential trips was calculated based on TTS data for home-based work trips.

Results of the TTS data extraction indicate that the general distribution of residential site traffic will be similar for the weekday AM and PM peak hours. **Table 4-2** below summarizes the general directional distribution of the site traffic with traffic shown in **Figure 4-1**.

Table 4-2: Site Trip Generation

To/From	Inbound Distribution	Outbound Distribution
North	68%	57%
South	4%	5%
East	14%	12%
West	14%	26%
Total	**100%**	**100%**

Figure 4-1: Site Generated Traffic Volumes, Weekday AM (PM) Peak Hour



3085 HURONTARIO STREET
CITY OF MISSISSAUGA

Mixed Use Development
Urban Transportation Considerations

Prepared For: Equity Three Holdings Inc.

September 2023

BA Group

3.0 PROPOSED REDEVELOPMENT

3.1 Development Uses

The proposed development includes four (4) mixed-use buildings comprising the following uses:

- **Building 1:** 430 residential units and 686 square metres of retail GFA
- **Building 2:** 501 residential units and 474 square metres of retail GFA
- **Building 3:** 355 residential units
- **Building 4**: 372 residential units

Overall, the updated development plan includes 1,658 residential units (all market condominium) and 1,160 square metres of retail GFA. In comparison to the initial July 2021 submission, the number of residential units has increased substantially with a modest increase in retail GFA. The updated development proposal is outlined in **Table 1** and illustrated in **Figure 2**. Reduced scale architectural plans are provided in **Appendix B**.

13.3 Site Traffic Volumes

13.3.1 Existing Site Traffic Volumes

The existing site consists of several retail uses. With the proposed redevelopment, the vehicular traffic to and from these uses will be removed from the area road network. There are 25 and 195 existing site trips during the weekday morning and afternoon peak hours, respectively, as summarized in **Table 17**.

Table 17 Existing Site Traffic Volumes

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Total Existing Site Trips (To Be Removed)	**20**	**5**	**25**	**95**	**100**	**195**

Notes:
1. All site trips are rounded to the nearest five (5).

13.3.2 Total Site Traffic Volumes

As previously discussed in **Section 12.0**, the site is expected to generate 390 and 400 two-way vehicle trips during the weekday morning and afternoon peak hours, respectively. These vehicle trips are summarized in **Table 18**.

Table 18 Total Site Traffic Volumes

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Residential	35	355	390	255	145	400
Retail	0	0	0	0	0	0
Total	**35**	**355**	**390**	**255**	**145**	**400**

Notes:
1. All site trips are rounded to the nearest five (5).

13.3.3 Net New Site Traffic Volumes

Relative to existing conditions, the site redevelopment will generate an additional (or “net new”) 365 and 205 two-way vehicle trips during the weekday morning and afternoon peak hours, respectively.

Table 19 Net New Site Traffic Volumes

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Existing Site Trips (To Be Removed)	20	5	25	95	100	195
Total Site Trips	35	355	390	255	145	400
Net New Site Trips	**15**	**350**	**365**	**160**	**45**	**205**

Notes:
1. All site trips are rounded to the nearest five (5).

13.3.4 Site Trip Distribution

13.3.4.1 RESIDENTIAL TRIP DISTRIBUTION

Residential vehicle site trips were assigned onto the area road network based upon a review of travel information provided by the 2016 Transportation Tomorrow Survey (TTS) for home-based trips in the site environs. The TTS queries are provided in **Appendix G**.

The residential site traffic distribution is summarized in **Table 20**.

Table 20 Residential Site Traffic Distribution

To / From Cardinal Direction	Corridor	Inbound	Outbound
North	Hurontario Street	45%	40%
	Confederation Parkway	15%	15%
South	Hurontario Street	15%	25%
	Confederation Parkway	0%	0%
East	Dundas Street East	15%	10%
West	Hillcrest Avenue	5%	5%
	Dundas Street West	5%	5%
Total		**100%**	**100%**

Notes:
1. The studied 2016 TTS zones include 3723, 3724, 3862, 3867, 3871 and 3872.

13.3.5 Site Traffic Volume Figures

Figure 13 and **Figure 14** illustrate the total and net new site traffic volumes on the study area road network, respectively.

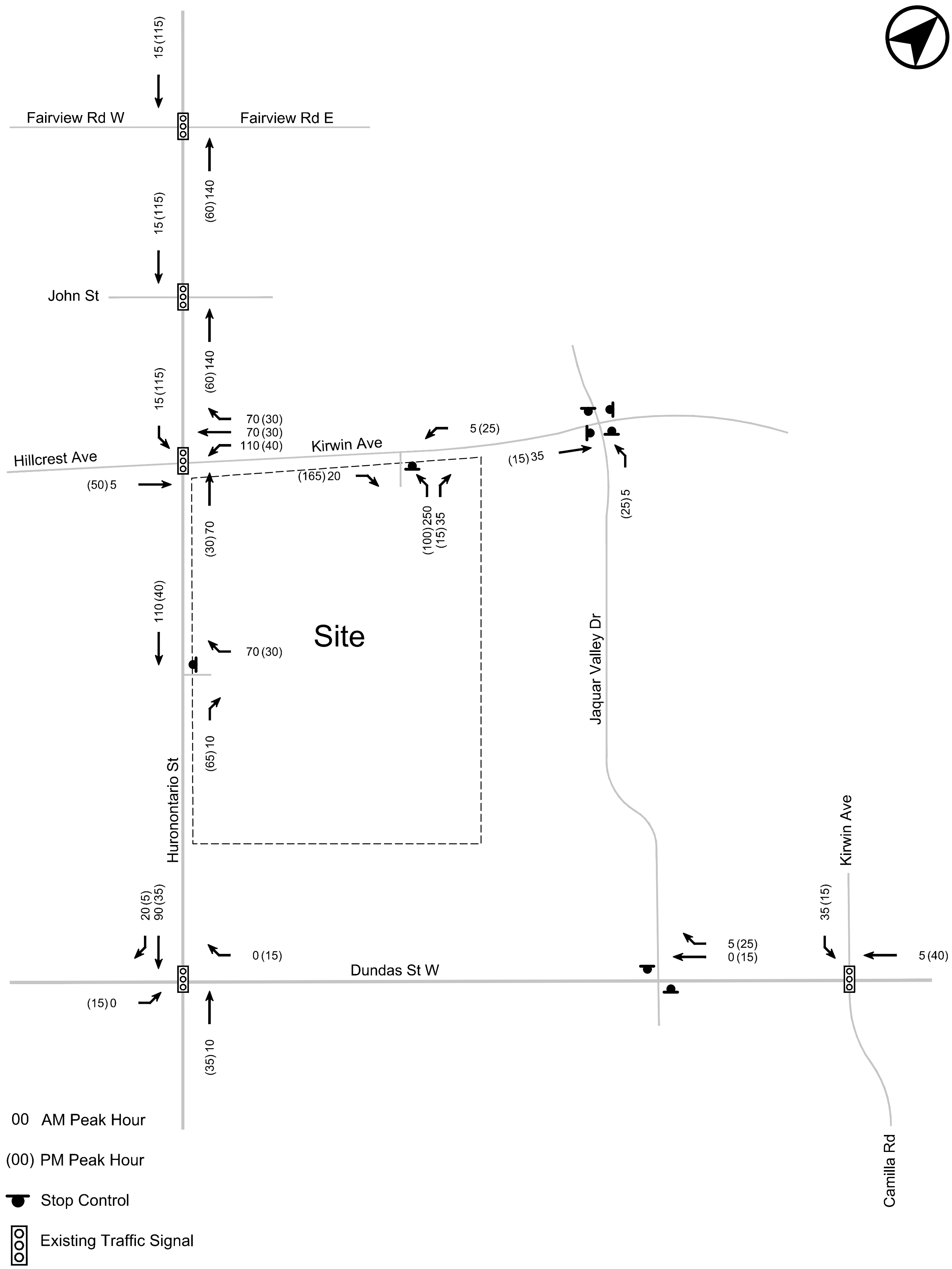


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FIGURE 13 RESIDENTIAL SITE TRAFFIC VOLUMES

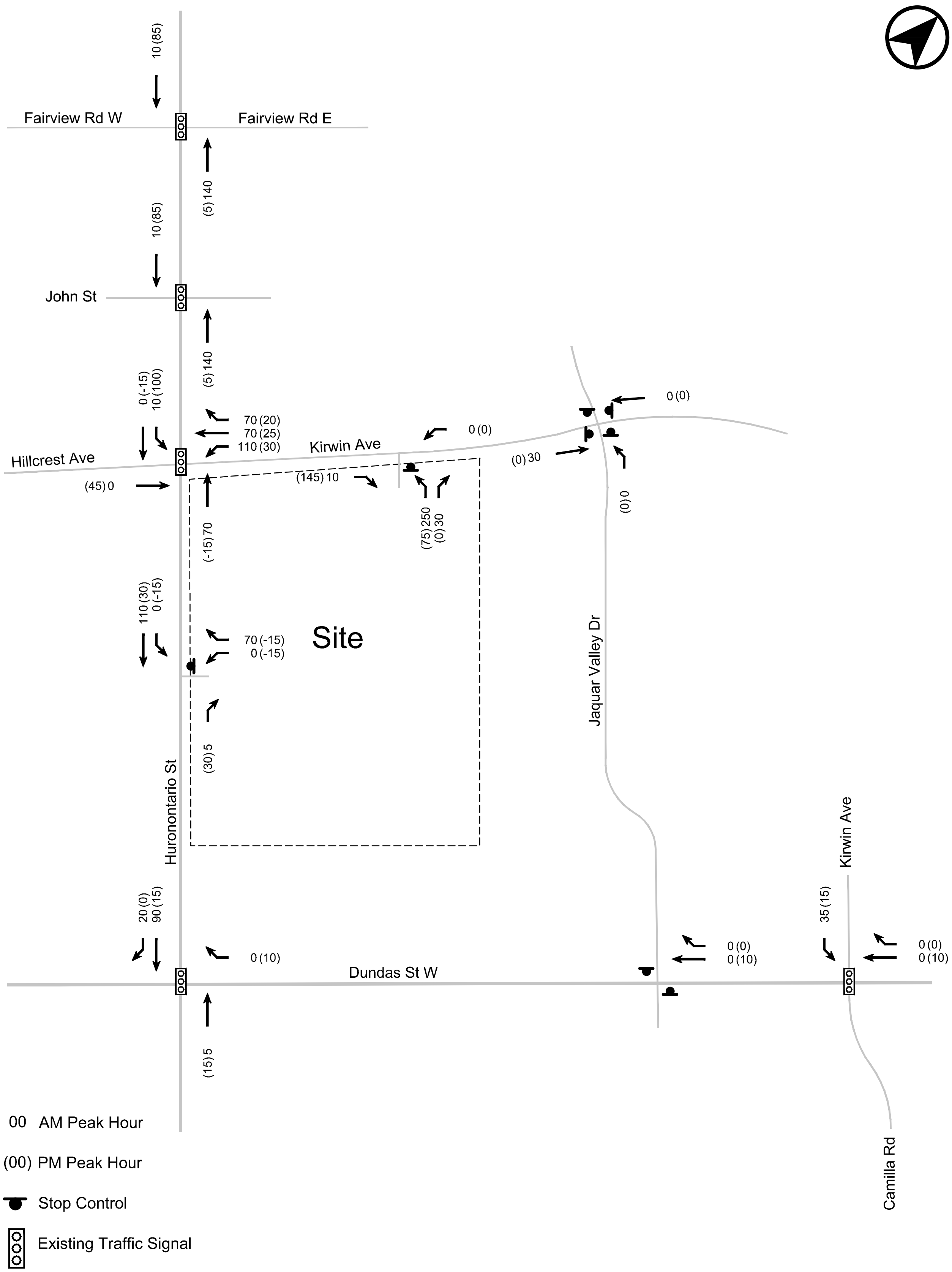

FIGURE 14 NET NEW SITE TRAFFIC VOLUMES

17.0 COMMUNITY IMPACTS

A key consideration in this new transportation report includes the generation of traffic resulting from the proposed development. While it is anticipated that the site will generate additional vehicular activity, impacts on the community are expected to be limited and localized on the local and arterial road network as discussed in the preceding sections, recognizing the future impacts of the Hurontario LRT. Furthermore, the new roads through the site provide more routes of travel for residents to / from the new retail destinations on-site and beyond.

The surrounding road network is designed to handle future traffic levels with the completion of the LRT and have sufficient capacity to accommodate the projected increase with the various improvements proposed as concluded in the capacity analysis included in this report. **Table 35** provides a summary of net-new two-way traffic volumes added to key road sections within the study area during peak hours.

Table 35 Net-New Two-Way Traffic Volume Summary

Road Name	Road Classification	Net-New Two-Way Volumes
Hurontario Street	Arterial	285 (245)
Dundas Street	Arterial	75 (95)
Hillcrest Avenue / Kirwin Avenue	Major Collector	340 (350)
Jaguar Valley Drive, New Municipal and Private Streets	Local	10 (30)

Notes:
1. xx (xx) = weekday morning peak hour (weekday afternoon peak hour).

On January 10, 2022, a virtual public meeting for the site was held by the Planning and Development Committee to discuss the proposed development based on the initial application submission dated July 2021. The following key transportation-related comments from councillors and residents were raised:

- Support for intensification in transit-oriented areas (LRT and GO) of the City;
- Concern for cycling and pedestrian access, circulation, and safety to / from site and to transit as per local policies and plans; and
- Concern for reduced visitor parking to the updated Zoning By-law standard.

In summary, the immediate residential areas surrounding the development would experience a modest increase in traffic flow generated by the proposed development. In addition, as part of this resubmission, the revised proposal aims to address community comments received by refining the design of the site and thoroughly reviewing the appropriateness of the vehicle, cycling, and pedestrian services, amenities, and provisions. As such, an updated TDM Plan (**Section 6.0**) and evolving policy and transportation context review (**Section 4.0** and **Section 5.0**) have been provided.

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Transportation Impact Study

PROPOSED DAM CHARITY & RESIDENTIAL

3115 Hurontario Street,
MISSISSAUGA, ONTARIO

September 2022
Project No: NT-21-262

Table 1 – Modes of Travel based on 2016 TTS Data for Traffic Zones

Time Period	Auto Driver	Auto Passenger	Taxi/Paid Ride Share	Transit	Cycle	Walk
AM Peak Period (6:00-9:00 AM)	60%	10%	0%	24%	0%	6%
PM Peak Period (3:00-6:00 PM)	64%	7%	0%	26%	0%	3%

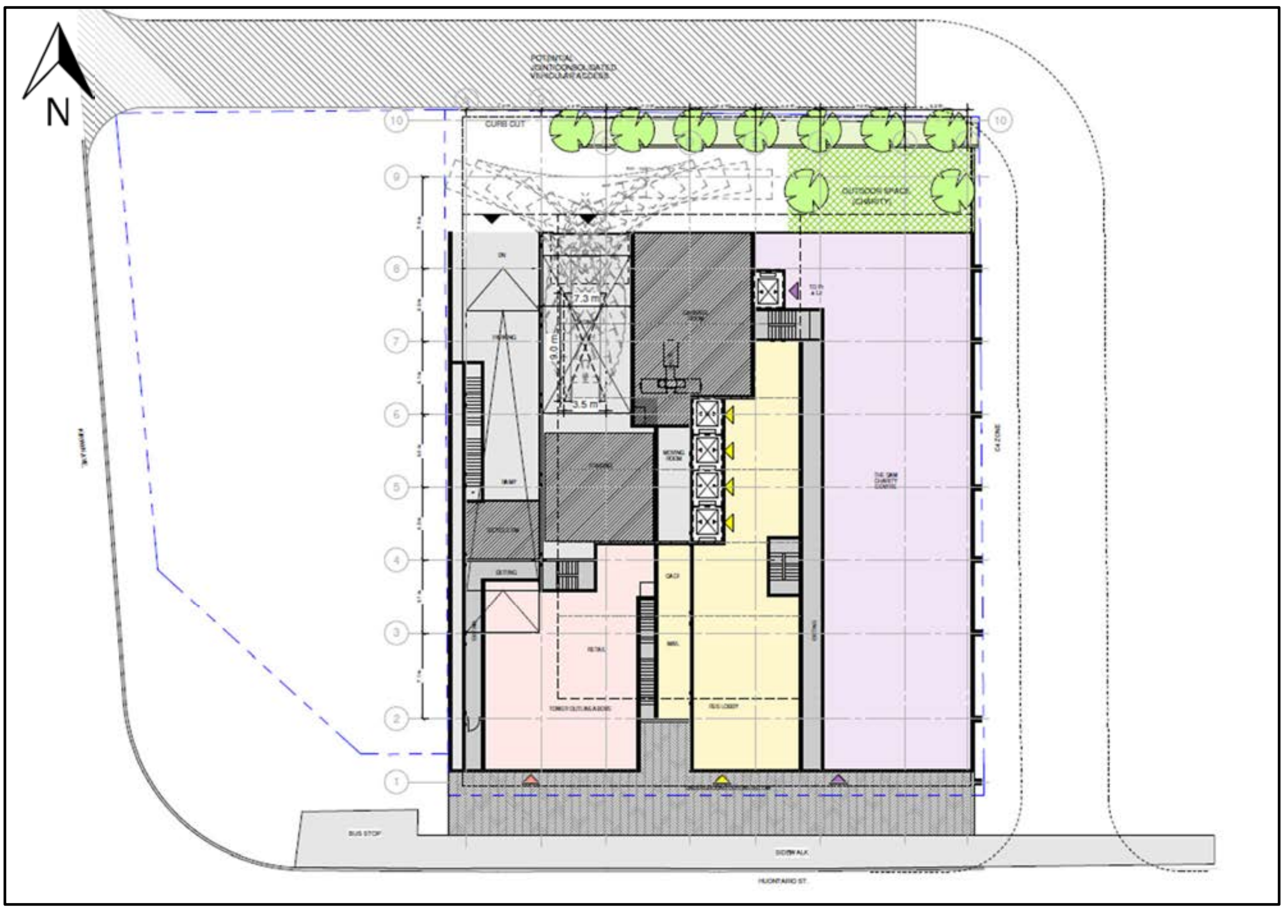
Based on the information outlined in the table above, the existing non-auto modal split in the area is approximately 40% and 36% during the morning and afternoon peak periods, respectively. This assessment suggests that there are viable alternative modes of transportation other than driving private automobiles. It is anticipated that with the future Hurontario LRT, the modal split along this corridor and this area will be much higher (i.e. 50% for all modal split).

3.3. Proposed Development Statistics

Currently, the subject site consists of a stone facade building which is operated by Dam Youth Drop-in Community Service. The existing land uses are under-utilized given the major transit improvements for the area.

The proposed redevelopment of the site consists of a 35-storey mixed-use building with a total of 431 residential dwelling units, as well as a ground related retail gross floor area of 217 m^2. The proposed development will provide a total of 280 parking spaces and 281 bicycle parking spaces. A full moves access will be provided onto Kirwin Avenue, with a right-in/right-out will be provided onto Hurontario Street to service the proposed development. It should be noted that both of these accesses will be shared with the adjacent development. **Figure 4** illustrates the proposed development site plan.

Figure 5 – Proposed Site Plan



3.4. Site Trip Generation

For the purposes of this assessment, trip generation forecasts for the proposed development is estimated using the information outlined in the Trip Generation Manual, 11th Edition, published by the Institute of Transportation Engineers (ITE). For the purposes of this assessment, the ITE Land Use Code (LUC) 222 "Multifamily Housing (High-Rise) Close to Rail Transit" and LUC 820 "Shopping Centre" average rates have been utilized for the proposed development.

Given that the proposed retail component is very small and it is intended to service the future residents in the proposed development, adjacent developments and residents within walking distance. It is not anticipated to generate any auto trips to and from the site, however, to be conservative, it has been included in the analysis. The estimated trip generation calculations are provided in **Tables 2**.

Table 2 – Site Trip Generation

ITE Land Use	Magnitude (units)	Parameters		Morning Peak Hour			Afternoon Peak Hour		
				In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) LUC 222 Close to Rail Transit	431	Vehicle Trips	Trip Rates (use average as no equations were given)	0.08	0.15	0.23	0.15	0.11	0.26
			Total Trips	**33**	**66**	**99**	**64**	**48**	**112**
		Walk + Bike + Transit	Trip Rates (use average as no equations were given)	0.15	0.02	0.17	0.05	0.10	0.15
			Total Trips	**65**	**8**	**73**	**22**	**43**	**65**
Shopping Centre LUC (820)	2,333	Vehicle Trips	Trip Rates (use average rates due to small GFA)	0.52	0.32	0.84	1.63	1.77	3.40
			Total Trips	**1**	**1**	**2**	**4**	**4**	**8**
Total Trips (round off to nearest 5 trips)				***100***	***75***	***175***	***90***	***95***	***185***
New Non-Auto Trips (Walk + Bike + Transit)				*65*	*10*	*75*	*20*	*45*	*65*
New Auto Trips				*35*	*65*	*100*	*70*	*50*	*120*

Based on the analysis indicated above, the proposed development is expected to generate:

- 175 total two-way trips (100 inbound and 75 outbound) and 185 total two-way trips (90 inbound and 95 outbound) during the morning and afternoon peak hours, respectively;
- 100 total two-way auto trips (35 inbound and 65 outbound) and 120 total two-way auto trips (70 inbound and 50 outbound) during the morning and afternoon peak hours, respectively; and
- 75 total two-way non-auto trips (65 inbound and 10 outbound) and 65 total two-way transit trips (20 inbound and 45 outbound) during the morning and afternoon peak hours, respectively.

3.5. Existing Land Use Generation

As indicated, currently, the subject site consists of a stone facade building which is operated by Dam Youth Drop-in Community Service. It is anticipated the land uses will generate some auto trips, transit trips, as well as some walking and cycling trips to and from the proposed developments.

Typically, turning movement counts will be undertaken at the existing access points to capture the existing trip generations for comparison purposes. However, due to the pandemic, counts are not possible at this time.

To be conservative and for the purpose of this assessment, the existing trips from the proposed development will not be removed from the existing intersection counts in the study area. Therefore, the analysis is conservative.

3.6. Site Trip Distribution and Assignment

The 2016 Transportation Tomorrow Survey (TTS) data was reviewed for Traffic Zones (3632, 3653, 3657 and 3659) in order to estimate the general trip distribution for the proposed development. **Table 4** summarizes the planning district/traffic zones distribution based on the 2016 TTS data, with **Table 5** summarizing the site trip assignment based on the 2016 TTS data detailed and existing transportation network in the area.

Table 3 – Site General Trip Distribution

Mode of Travel	Mississauga	Brampton	Toronto	York Region	Halton Region	Total
Auto	71%	4%	14%	3%	8%	100%
Transit	65%	0%	32%	1%	2%	100%

Table 4 – Site Trip Distribution

General Direction	Auto %	Transit Routes	Transit %
North (Hurontario Street, Cawthra Road, Confederation Parkway, Mavis Road)	28%	North (Hurontario)	24%
South (Hurontario Street, Cawthra Road, Confederation Parkway, Mavis Road)	21%	South (Hurontario)	15%
East (Dundas Street, The Queensway, Central Parkway, Burnhamthorpe Road, Hwy 403)	27%	East (Dundas, Burnhamthorpe, Milton GO Line)	42%
West (Dundas Street, The Queensway, Central Parkway, Burnhamthorpe Road, Hwy 403)	24%	East (Dundas, Burnhamthorpe, Milton GO Line)	19%
Total	***100%***		***100%***

Figure 6 illustrates the proposed development generated traffic volumes for the morning and afternoon peak hours, respectively.

It should be noted that the auto site trip distribution and assignment have been taken into consideration the 2016 TTS information, the future access configurations and logical routing.

4.0 EXISTING CONDITION ASSESSMENT

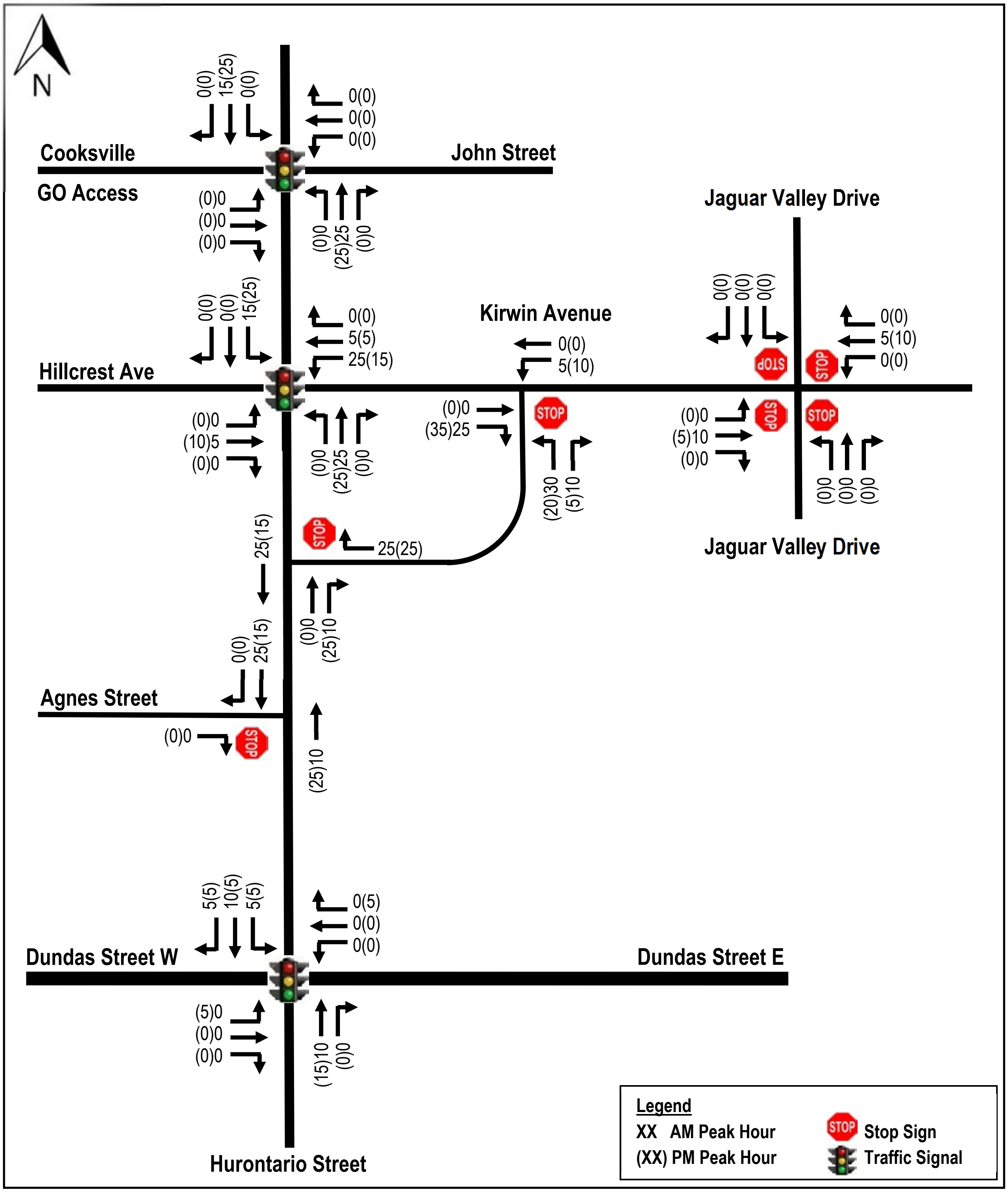
4.1. Existing Road Network

The existing road network, lane configuration and existing traffic control for the study area are shown in **Figure 6** (Existing Lane Configurations). The characteristics of the main road network are described below.

- **Hurontario Street**: is a north-south arterial road under the jurisdiction of the City of Mississauga. It currently has six-lane cross-section through the study area and maintains a posted speed limit of 50 km/h to - 60 km/h at various sections of the road. The LRT construction has started and anticipated completion is 2024.
- **Dundas Street**: is an east-west arterial road under the jurisdiction of the City of Mississauga. It has a four-lane cross-section with turning lanes at major intersections. It maintains a posted speed limit of 50 km/h near the subject site. Dundas Street is identified as a BRT corridor.
- **Kirwin Avenue:** is an east-west major collector under the jurisdiction of the City of Mississauga. It generally has a two-lane cross-section with turning lanes at the major intersections. It maintains a posted speed limit of 50 km/h near the subject site.
- **Hillcrest Avenue**: is an east-west major collector under the jurisdiction of the City of Mississauga. It generally has a four-lane cross-section with turning lanes at the major intersections. It maintains a posted speed limit of 50 km/h near the subject site.
- **John Street**: is an east-west local road under the jurisdiction of the City of Mississauga. It generally has a two-lane cross-section with turning lanes at the major intersections. It maintains a posted speed limit of 50 km/h near the subject site.
- **Agnes Street**: is an east-west local road under the jurisdiction of the City of Mississauga. It generally has a two-lane cross-section.

- **Jaguar Valley Drive**: is north-south local road under the jurisdiction of the City of Mississauga. It generally has a two-lane cross-section.

Figure 6 – Site Traffic Volumes



TRAFFIC IMPACT STUDY

3420 & 3442 HURONTARIO STREET

CITY OF MISSISSAUGA
REGION OF PEEL

PREPARED FOR:

BET REALTY LTD. & 3420 HURONTARIO STREET INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4

ORIGINAL: OCTOBER 2020
UPDATED: DECEMBER 2022

CFCA FILE NO. 1932-5666

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The intersection of Hurontario Street at Hillcrest Avenue is projected to operate at a Level of Service "C" during the weekday a.m. peak period and p.m. peak period, with average delays per vehicle of 24.9 and 32.1 seconds, respectively. Compared to the existing scenario, the average delay per vehicle increases by 3.8 seconds and decreases by 1.9 seconds during the a.m. and p.m. peak periods, respectively. A maximum volume-to-capacity ratio of 0.97 was observed for the eastbound left-turn movement during the weekday p.m. peak period.

The analysis also indicates that the study intersections are expected to operate similarly to existing conditions under future background conditions.

5.0 Development Proposal

The subject property is approximately 0.65 ha and currently consists of an existing office building. The property, located in a mixed-use neighbourhood, is bounded by Central Parkway West to the north, Hurontario Street to the east, and commercial developments to the south and west. The Site is accessed by right-in-right-out (RIRO) accesses, one on Hurontario Street and one on Central Parkway West.

The elements envisioned for this development include:

- A mixed-use residential development with 683 residential units and 2,906sq.m. of retail area
- An underground parking area
- An aboveground parking area

5.1 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network that previously did not exist. The proposed development will also result in additional turning movements at the boundary road intersections.

The trip generation of the proposed development was forecasted using the rates provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition.

2016 Transportation Tomorrow Survey (TTS) data was used to determine the existing modal split. Based on the Transportation Tomorrow Survey, there are 23% and 26% modal split during a.m. and p.m. peak hours. We have considered a 20% modal split during the weekday a.m. peak period and 25% modal split during the weekday p.m. peak period. Modal split calculations are attached. Land use Category 222 "Multifamily Housing (High-Rise)" and Land use Category 820 "Shopping Centre" was used to forecast the trips generated by the development. The forecasted primary trips are tabulated in Table 6.

Pass-by Trips

The pass-by trips were estimated using the information in Chapter 5 of the ITE's Trip Generation handbook. The ITE handbook defines primary trips as "trips made for the specific purpose of visiting the generator". When applying pass-by trips to the commercial part of the proposed development, the trips were applied the weekday p.m. and not the weekday a.m. peak hour. The percentage of pass-by trips applied to the trip generation calculations was found in Chapter 5 of the ITE's Trip Generation Handbook. A pass-by rate of 34% was applied to the p.m. Pass-by assignment, and gross trips assignments are shown in Appendix I.

Table 6: Trip Generation

	Land Use Code	A.M. Peak Hour			P.M. Peak Hour		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Multifamily Housing (High-Rise)							
Total Gross Trips	222 - Multifamily Housing (High-Rise)	49	155	204	147	94	241
Pass-by Trips		0	0	0	0	0	0
Modal Split		10	32	42	38	24	62
Internal Capture Trips		1	2	3	10	4	14
New Primary Trips		**38**	**121**	**159**	**99**	**66**	**165**
Shopping Center							
Total Gross Trips	820 - Shopping Center	18	11	19	57	62	119
Pass-by Trips		0	0	0	19	21	40
Modal Split		0	0	0	0	0	0
Internal Capture Trips		2	1	3	4	10	14
New Primary Trips		**16**	**10**	**26**	**34**	**31**	**65**
TOTAL GROSS TRIPS		**67**	**166**	**233**	**204**	**156**	**360**
TOTAL PASS-BY TRIPS		**0**	**0**	**0**	**19**	**21**	**40**
TOTAL MODAL SPLIT		**10**	**32**	**42**	**38**	**24**	**62**
TOTAL INTERNAL CAPTURE TRIPS		**3**	**3**	**6**	**14**	**14**	**28**
TOTAL PRIMARY TRIPS		**54**	**131**	**185**	**133**	**97**	**230**

Overall, the development is expected to generate 185 two-way (54 inbound and 131 outbound) trips during the weekday a.m. peak hour and 230 two-way (133 inbound and 97 outbound) trips during the weekday p.m. peak hour.

5.2 Trip Distribution and Assignment

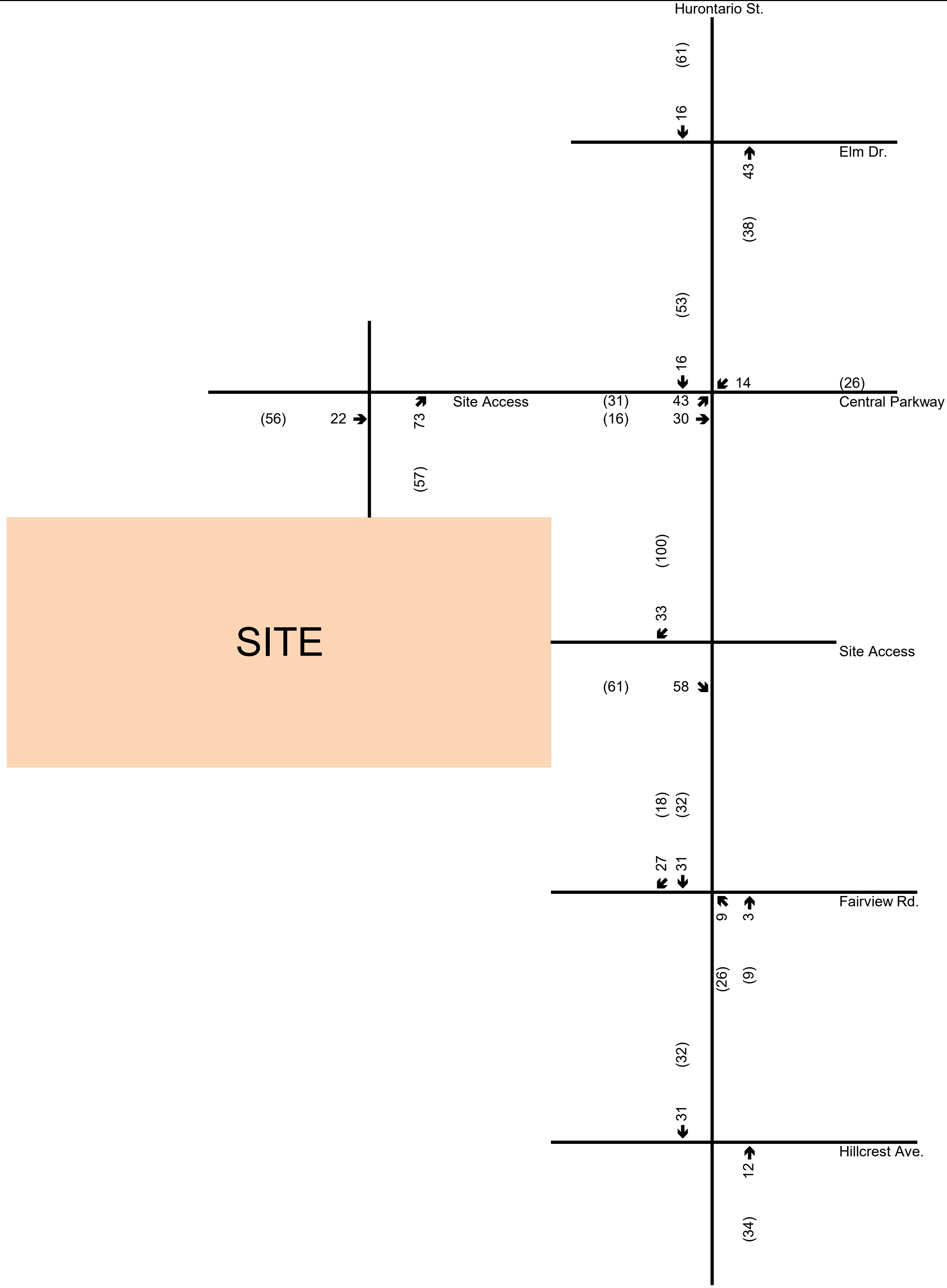
Existing travel patterns were used to determine the trip distribution for the proposed development. Table 7 below outlines the trip distribution for the proposed development, divided into time and travel direction. Data from TTS (Transportation Tomorrow Survey) was used to compare with the existing traffic data, and the results were similar, so existing travel patterns were used. TTS Data can be found in Appendix D.

Figure 7 illustrates the assumed trip distribution, and Figure 8 shows the trip assignment for the proposed development.

Table 7: Site Distribution

	A.M. Peak Hour	P.M. Peak Hour
Direction	In (Out)	In (Out)
North	29% (32%)	40% (32%)
South	23% (24%)	26% (33%)
East	23% (21%)	15% (19%)
West	25% (23%)	19% (16%)

FIGURES



Legend

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

3420 & 3442 Hurontario Street

Site Traffic - Assignment

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Figure 8

Project No. 1932-5666
Date. 2022.12.16
Analyst. HN

APPENDIX I:

Trip Generation Excerpts

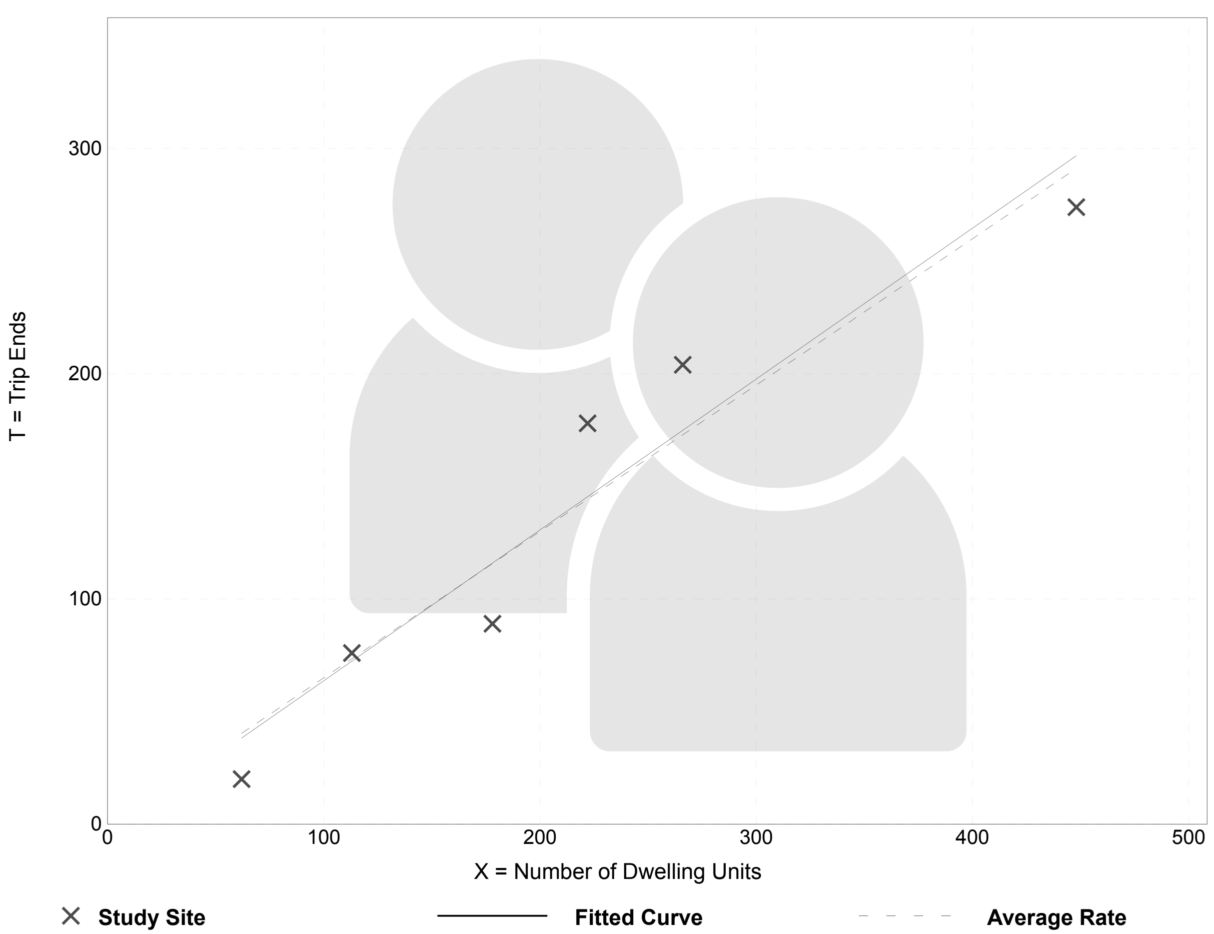
Multifamily Housing (High-Rise)
Close to Rail Transit (222)

Person Trip Ends vs:	**Dwelling Units**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**Dense Multi-Use Urban**
Number of Studies:	6
Avg. Num. of Dwelling Units:	215
Directional Distribution:	24% entering, 76% exiting

Person Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.65	0.32 - 0.80	0.14

Data Plot and Equation



Fitted Curve Equation: $T = 0.67(X) - 3.32$

$R^2 = 0.92$

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Multifamily Housing (High-Rise)
Close to Rail Transit (222)

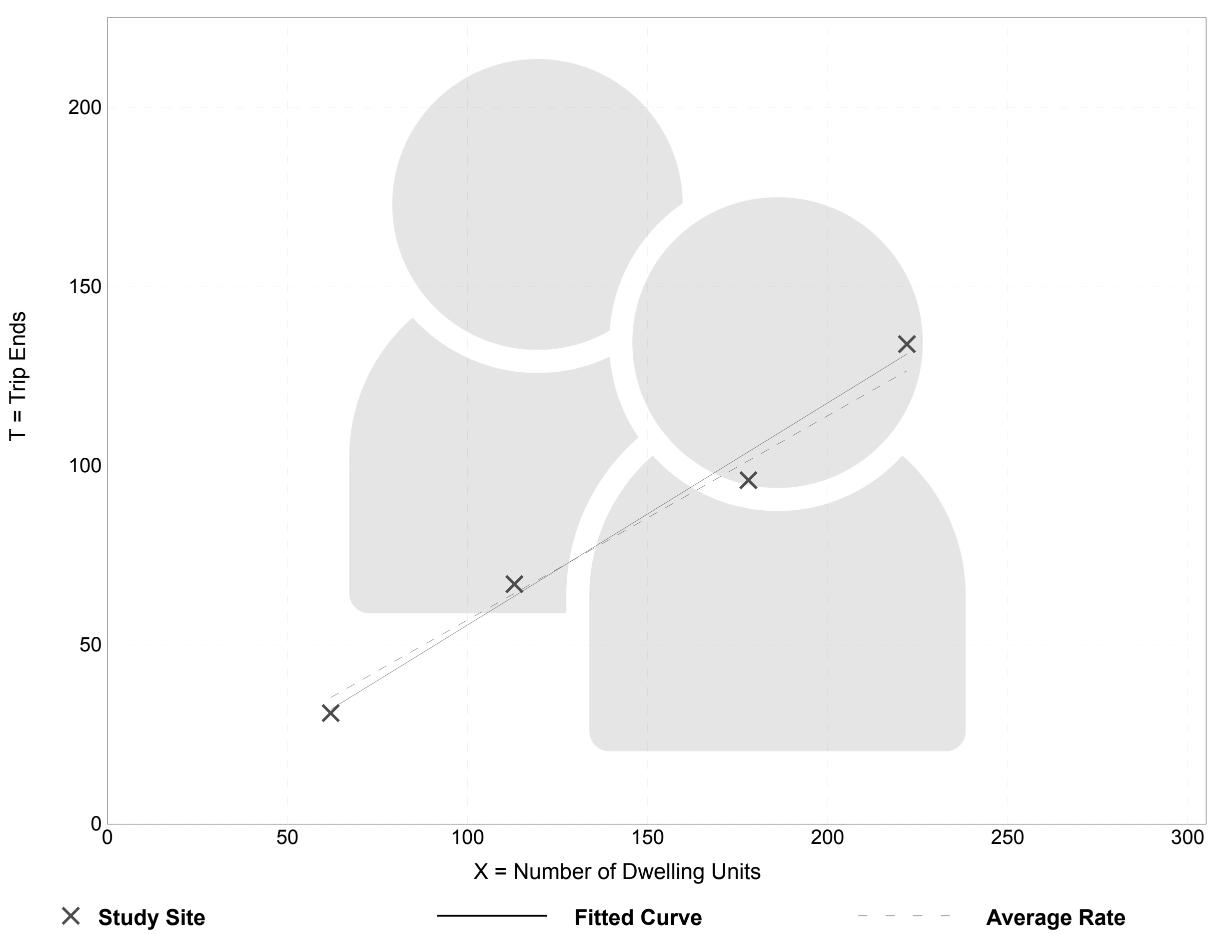
Person Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **Dense Multi-Use Urban**
Number of Studies: 4
Avg. Num. of Dwelling Units: 144
Directional Distribution: 59% entering, 41% exiting

Person Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.50 - 0.60	0.04

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: T = 0.62(X) - 6.41 **R^2= 0.99**

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Strip Retail Plaza (<40k)
(822)

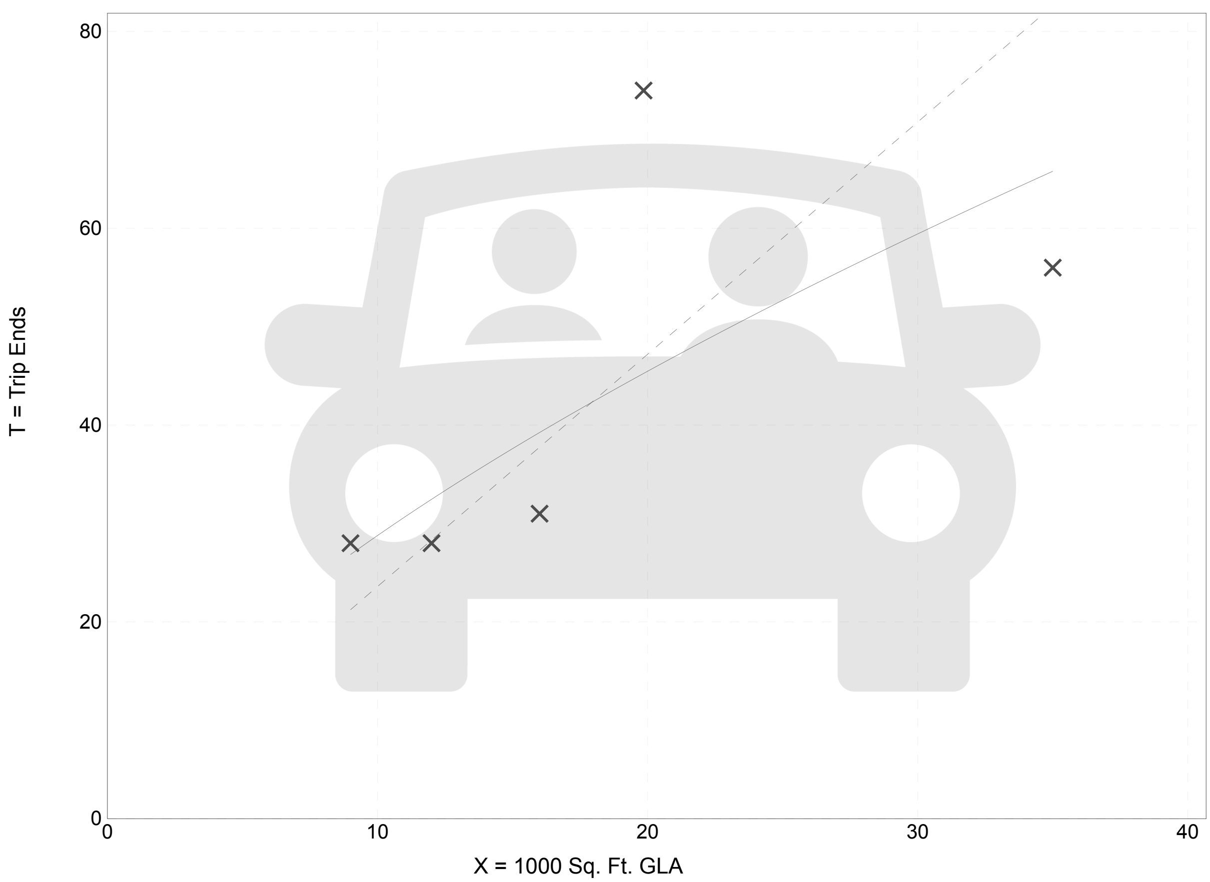
Vehicle Trip Ends vs:	**1000 Sq. Ft. GLA**
On a:	**Weekday,** **Peak Hour of Adjacent Street Traffic,** **One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	5
Avg. 1000 Sq. Ft. GLA:	18
Directional Distribution:	60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation

Caution – Small Sample Size



Study Site — **Fitted Curve** — **Average Rate**

Fitted Curve Equation: $\ln(T) = 0.66 \ln(X) + 1.84$

R^2= 0.57

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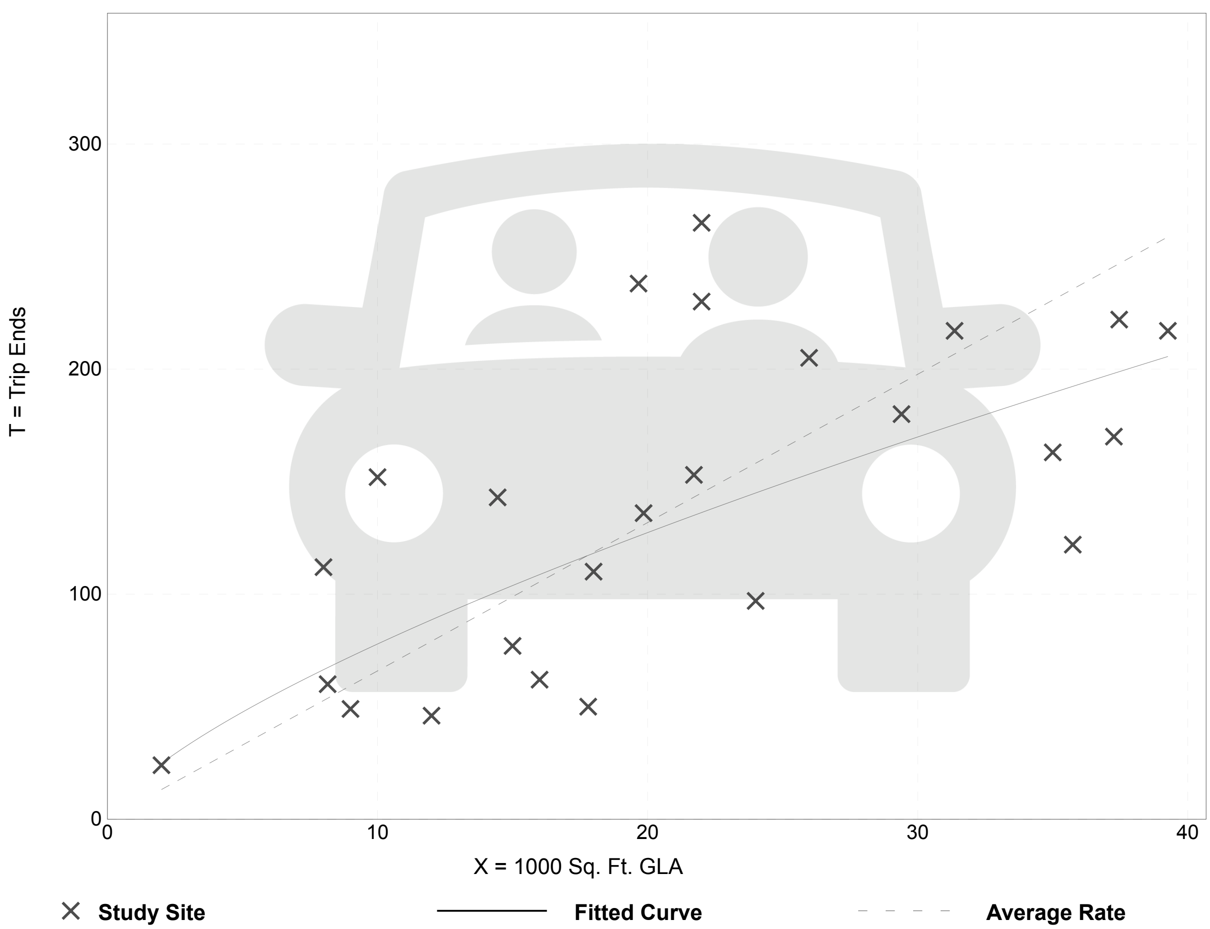
Strip Retail Plaza (<40k)
(822)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GLA**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	25
Avg. 1000 Sq. Ft. GLA:	21
Directional Distribution:	50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.71\ Ln(X) + 2.72$ **R^2= 0.56**

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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 6.1 Unconstrained Internal Person Trip Capture Rates for Trip Origins within a Mixed-Use Development

		WEEKDAY	
		AM Peak Hour	PM Peak Hour
From OFFICE	To Retail	28%	20%
	To Restaurant	63%	4%
	To Cinema/Entertainment	0%	0%
	To Residential	1%	2%
	To Hotel	0%	0%
From RETAIL	To Office	29%	2%
	To Restaurant	13%	29%
	To Cinema/Entertainment	0%	4%
	To Residential	14%	26%
	To Hotel	0%	5%
From RESTAURANT	To Office	31%	3%
	To Retail	14%	41%
	To Cinema/Entertainment	0%	8%
	To Residential	4%	18%
	To Hotel	3%	7%
From CINEMA/ENTERTAINMENT	To Office	0%	2%
	To Retail	0%	21%
	To Restaurant	0%	31%
	To Residential	0%	8%
	To Hotel	0%	2%
From RESIDENTIAL	To Office	2%	4%
	To Retail	1%	42%
	To Restaurant	20%	21%
	To Cinema/Entertainment	0%	0%
	To Hotel	0%	3%
From HOTEL	To Office	75%	0%
	To Retail	14%	16%
	To Restaurant	9%	68%
	To Cinema/Entertainment	0%	0%
	To Residential	0%	2%

Source: Bochner, B., K. Hooper, B. Sperry, and R. Dunphy. NCHRP Report 684: *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments.* Washington, DC: Transportation Research Board, Tables 99 and 100, 2011.

Table 6.2 Unconstrained Internal Person Trip Capture Rates for Trip Destinations within a Mixed-Use Development

		Weekday	
		AM Peak Hour	PM Peak Hour
To OFFICE	From Retail	4%	31%
	From Restaurant	14%	30%
	From Cinema/Entertainment	0%	6%
	From Residential	3%	57%
	From Hotel	3%	0%
To RETAIL	From Office	32%	8%
	From Restaurant	8%	50%
	From Cinema/Entertainment	0%	4%
	From Residential	17%	10%
	From Hotel	4%	2%
To RESTAURANT	From Office	23%	2%
	From Retail	50%	29%
	From Cinema/Entertainment	0%	3%
	From Residential	20%	14%
	From Hotel	6%	5%
To CINEMA/ENTERTAINMENT	From Office	0%	1%
	From Retail	0%	26%
	From Restaurant	0%	32%
	From Residential	0%	0%
	From Hotel	0%	0%
To RESIDENTIAL	From Office	0%	4%
	From Retail	2%	46%
	From Restaurant	5%	16%
	From Cinema/Entertainment	0%	4%
	From Hotel	0%	0%
To HOTEL	From Office	0%	0%
	From Retail	0%	17%
	From Restaurant	4%	71%
	From Cinema/Entertainment	0%	1%
	From Residential	0%	12%

Source: Bochner, B., K. Hooper, B. Sperry, and R. Dunphy. NCHRP Report 684: *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments.* Washington, DC: Transportation Research Board, Tables 101 and 102, 2011.

APPENDIX J:

TTS Data

Mode	AM IN	AM OUT	PM IN	PM OUT	TOTAL	Existing Mode Split (Total)
Auto	543	592	784	398	2317	78%
Transit	149	220	110	29	508	17%
Walk	56	34	17	0	107	4%
Cycle	35	0	0	0	35	1%
Total	783	846	911	427	2967	100%

Transit Increase (from HuLRT Business Case)

Wed Feb 21 2024 14:21:41 GMT-0500 (Eastern Standard Time) - Run Time: 2737ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: Primary travel mode of trip - mode_prime

Filters:
2006 GTA zone of destination - gta06_dest In 3862
and
Start time of trip - start_time In 0630-0930

Trip 2016
Table:

,Transit excluding GO rail,Cycle,Auto driver,Auto passenger,Walk
3862,149,35,447,96,56

Estimated Future Mode Split
53%
42%
4%
1%
100%

25%

Wed Feb 21 2024 14:29:26 GMT-0500 (Eastern Standard Time) - Run Time: 2741ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: Primary travel mode of trip - mode_prime

Filters:
2006 GTA zone of origin - gta06_orig In 3862
and
Start time of trip - start_time In 0630-0930

Trip 2016
Table:

,Transit excluding GO rail,Auto driver,GO rail only,Joint GO rail and local transit,Auto passenger,School bus,Walk
3862,144,532,37,39,32,28,34

Wed Feb 21 2024 14:14:24 GMT-0500 (Eastern Standard Time) - Run Time: 2510ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: Primary travel mode of trip - mode_prime

Filters:
2006 GTA zone of destination - gta06_dest In 3862
and
Start time of trip - start_time In 1530-1830

Trip 2016
Table:

,Transit excluding GO rail,Auto driver,Joint GO rail and local transit,Auto passenger,Walk
3862,99,669,11,115,17

Wed Feb 21 2024 14:31:48 GMT-0500 (Eastern Standard Time) - Run Time: 6457ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: Primary travel mode of trip - mode_prime

Filters:
2006 GTA zone of origin - gta06_orig In 3862
and
Start time of trip - start_time In 1530-1830

Trip 2016
Table:

,Transit excluding GO rail,Auto driver,Auto passenger
3862,29,357,41

Mon Nov 21 2022 16:38:55 GMT-0500 (Eastern Standard Time) - Run Time: 3082ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
2006 GTA zone of destination - gta06_dest In 3862, 3667, 3668, 3724
and
Start time of trip - start_time In 0630-0930
and
Trip purpose of destination - purp_dest In H

Trip 2016
Table:

,3667,3668,3724,3862
292,0,13,0,0
308,0,13,0,0
537,0,17,0,0
3330,0,11,0,0
3419,0,43,13,0
3601,0,14,0,0
3606,0,0,27,0
3621,0,0,38,0
3632,0,0,19,0
3649,29,10,27,32
3657,0,0,0,15
3665,0,23,0,0
3668,0,57,0,0
3669,0,28,0,0
3671,0,25,38,0
3673,0,0,45,0
3674,0,25,0,0
3686,10,0,12,0
3696,0,23,0,0
3724,0,43,0,0
3847,0,14,0,0
3851,0,13,0,0
3877,0,29,0,0

Mon Nov 21 2022 16:53:19 GMT-0500 (Eastern Standard Time) - Run Time: 2286ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA zone of origin - gta06_orig In 3862, 3667, 3668, 3724
and
Start time of trip - start_time In 0630-0930
and
Trip purpose of origin - purp_orig In H

Trip 2016
Table:

,3667,3668,3724,3862
21,0,26,0,0
36,23,0,0,0
37,0,0,0,32
38,0,25,0,0
43,0,13,0,0
50,0,60,0,0
51,6,44,0,0
53,0,0,36,0
54,11,0,0,0
55,0,24,0,0
57,9,0,0,0
58,0,0,0,37
63,0,51,0,0
65,0,14,0,0
67,0,0,21,0
113,0,16,0,0
116,0,12,0,0
160,0,0,13,0
176,0,10,0,0
180,0,0,47,0
201,0,31,0,0
204,0,0,0,11
210,14,0,0,0
221,0,22,0,0
231,0,0,12,0
246,0,10,0,0
286,0,0,0,27
292,0,32,0,0
293,0,16,0,0
299,12,31,0,0
301,0,41,0,0
307,0,50,0,0
308,0,13,0,0
313,0,16,0,0
317,0,32,0,0

332,28,0,0,0
346,43,0,0,0
356,0,0,25,0
358,0,0,0,19
371,0,50,0,0
383,0,42,0,0
395,17,0,0,0
415,0,0,0,32
443,0,31,0,0
452,0,0,8,0
461,0,16,0,0
532,0,38,0,0
589,0,0,0,24
2085,0,16,0,0
2096,0,106,0,0
2107,0,0,12,0
2375,0,0,0,21
2395,0,8,0,0
2401,0,9,0,0
3328,0,15,0,0
3383,0,0,22,0
3601,0,28,0,0
3605,0,14,0,0
3606,0,0,54,0
3609,0,17,0,0
3611,0,25,0,0
3612,0,0,12,0
3613,0,0,13,0
3621,0,0,13,0
3631,0,16,0,0
3632,61,93,19,0
3634,0,50,19,0
3635,0,0,16,0
3639,0,0,0,18
3643,0,32,0,48
3648,7,0,0,0
3649,75,67,82,98
3653,17,0,0,0
3654,0,14,0,0
3655,0,25,0,0
3657,0,0,0,15
3658,0,71,0,0
3659,0,64,0,0
3660,0,51,0,0
3662,0,0,0,46
3664,0,46,0,0
3665,0,46,0,0
3667,0,15,0,0
3668,9,236,0,0
3669,8,98,0,0
3671,0,264,64,0
3673,0,10,139,0
3674,9,127,0,0
3675,0,57,12,0
3684,0,14,0,0

3686,10,0,12,0
3689,22,0,0,0
3690,0,32,38,0
3693,0,0,25,0
3696,0,20,0,0
3697,0,12,0,0
3698,61,16,0,0
3700,0,0,13,0
3701,0,49,0,0
3703,16,0,0,0
3704,0,8,0,25
3705,0,0,38,0
3707,0,14,0,0
3709,0,14,0,0
3710,29,0,0,0
3713,0,0,72,0
3721,8,0,0,0
3724,0,0,22,0
3809,0,23,0,0
3811,0,13,0,0
3821,0,23,0,0
3823,0,20,0,0
3834,0,0,22,0
3835,10,0,0,0
3836,0,8,0,0
3842,0,26,0,0
3847,0,9,0,0
3850,0,0,29,0
3851,0,54,0,0
3853,0,17,0,32
3858,0,79,0,0
3860,0,0,8,0
3861,0,15,0,0
3862,28,60,7,0
3863,0,40,54,48
3865,0,0,0,21
3867,0,8,251,45
3870,0,0,10,0
3872,0,37,0,0
3874,0,23,0,0
3877,12,0,0,0
4003,0,0,44,0
4016,0,15,0,0
4023,0,0,13,0
4026,0,0,0,24
4027,0,0,44,0
4029,0,13,0,0
4030,0,28,0,0
4041,0,13,0,0
4042,0,0,0,25
4055,0,0,38,0
4082,0,16,0,0
4087,0,13,0,0
4147,0,37,0,0
5119,29,0,0,0

5142,0,0,12,0
8057,0,22,0,0
8614,0,14,0,0
8915,0,0,0,24

Mon Nov 21 2022 16:44:08 GMT-0500 (Eastern Standard Time) - Run Time: 3672ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
2006 GTA zone of destination - gta06_dest In 3862, 3667, 3668, 3724
and
Start time of trip - start_time In 1530-1830
and
Trip purpose of destination - purp_dest In H

Trip 2016
Table:

,3667,3668,3724,3862
15,0,0,11,0
35,0,41,0,0
36,23,0,0,0
37,0,0,12,32
38,0,25,0,0
43,0,13,0,0
50,61,10,0,0
51,6,44,0,0
52,0,0,0,19
53,0,17,36,0
54,11,0,0,0
55,0,53,0,0
63,0,51,0,0
67,0,0,21,0
130,0,56,0,0
176,0,10,0,0
201,0,31,0,0
204,0,0,0,11
210,14,0,0,0
231,0,0,12,0
246,0,10,0,0
299,13,60,0,0
307,0,50,0,0
309,0,0,0,70
317,0,32,0,0
332,28,0,0,0
346,22,0,0,0
356,0,0,25,0
358,0,0,0,19
371,0,93,0,0
395,17,0,0,0
415,0,0,0,32
443,0,31,0,0
452,0,0,8,0
456,16,0,0,0

460,0,13,0,0
532,0,38,0,0
589,0,0,0,24
610,0,0,12,0
2070,0,30,0,0
2096,0,106,0,0
2375,0,0,0,21
2395,0,8,0,0
2401,0,9,0,0
3343,0,0,22,0
3438,0,24,0,0
3601,0,35,0,0
3605,0,14,0,0
3606,0,0,54,0
3608,0,0,45,0
3609,0,59,0,0
3610,0,0,22,0
3612,0,0,12,0
3614,0,16,0,0
3621,0,0,57,0
3631,0,16,21,0
3632,61,89,0,18
3634,0,35,19,0
3635,0,0,16,0
3639,0,0,0,18
3643,0,32,0,48
3648,7,0,0,0
3649,0,57,0,0
3655,0,0,22,0
3658,0,26,0,0
3659,0,32,0,0
3660,0,33,0,0
3662,0,0,0,46
3664,12,46,0,0
3667,0,15,0,0
3668,9,68,0,0
3669,8,110,0,0
3671,12,90,0,0
3674,0,36,0,0
3675,0,0,12,0
3678,9,0,0,0
3680,0,39,0,58
3682,0,0,0,10
3685,0,0,14,0
3686,0,0,12,0
3690,0,0,38,0
3693,0,0,13,0
3696,0,20,0,0
3699,0,16,0,0
3700,0,0,13,0
3701,0,49,0,0
3702,0,0,12,18
3704,0,8,0,0
3705,0,0,38,0
3706,18,0,0,0

3707,0,14,0,0
3709,0,14,47,0
3710,29,0,0,0
3713,0,0,72,0
3719,0,42,0,0
3721,0,0,14,0
3811,0,13,0,0
3816,0,0,47,0
3820,0,0,17,0
3821,0,23,0,0
3823,0,20,0,0
3835,10,0,0,0
3843,0,20,0,0
3847,0,9,27,0
3850,0,0,29,0
3851,0,30,6,0
3853,0,17,0,32
3858,0,0,0,64
3860,0,0,8,0
3861,0,15,0,0
3863,0,12,27,0
3867,0,0,217,28
3870,0,0,10,0
3871,0,54,25,0
3872,0,37,9,0
3874,0,42,0,0
3877,0,24,13,0
4016,0,28,0,0
4023,0,0,13,0
4024,0,0,13,0
4026,0,0,0,24
4027,0,0,44,0
4041,0,13,0,0
4087,0,13,0,0
4147,0,37,0,0
4182,61,0,0,0
5210,0,0,0,32
8057,0,22,0,0

Mon Nov 21 2022 16:53:54 GMT-0500 (Eastern Standard Time) - Run Time: 3342ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA zone of origin - gta06_orig In 3862, 3667, 3668, 3724
and
Start time of trip - start_time In 1530-1830
and
Trip purpose of origin - purp_orig In H

Trip 2016
Table:

,3667,3668,3724,3862
50,0,10,0,0
51,0,0,15,0
127,0,13,0,0
224,0,0,0,27
259,0,68,0,0
299,13,0,0,0
308,0,13,0,0
328,0,14,0,0
346,22,0,0,0
391,0,50,0,0
3604,0,0,0,32
3610,0,0,22,0
3621,0,0,22,0
3632,0,0,0,18
3653,0,41,0,0
3655,0,0,22,0
3660,0,41,12,0
3661,0,0,7,0
3667,0,116,0,0
3668,0,25,0,0
3669,0,23,0,0
3675,0,0,25,0
3680,61,13,9,0
3693,0,25,13,0
3843,0,0,0,16
3851,0,16,12,17
3855,12,0,0,0
3863,0,0,38,0
3867,0,0,0,11
3871,0,30,25,0
3872,0,33,0,0
3874,0,82,0,0
4042,0,0,0,25
5164,0,43,0,0

Fri Feb 16 2024 11:49:44 GMT-0500 (Eastern Standard Time) - Run Time: 3207ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
2006 GTA zone of destination - gta06_dest In 3862, 3867, 3871, 3872
and
Start time of trip - start_time In 0630-0930
and
Trip purpose of destination - purp_dest In M,

Trip 2016
Table:

,3862,3867,3871
323,13,0,0
3653,0,0,48
3656,0,0,19
3657,0,13,0
3665,0,0,11
3724,7,0,0
3864,22,0,0
3867,0,13,0
3877,0,0,10

Fri Apr 12 2024 11:46:36 GMT-0400 (Eastern Daylight Time) - Run Time: 2591ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA zone of origin - gta06_orig In 3862, 3867, 3871, 3872
and
Start time of trip - start_time In 0630-0930
and
Trip purpose of origin - purp_orig In M,

Trip 2016
Table:

,3867,3871
3653,0,13
3661,0,35
3867,13,0
3877,0,10

Fri Feb 16 2024 11:44:19 GMT-0500 (Eastern Standard Time) - Ru

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
2006 GTA zone of destination - gta06_dest In 3862, 3867, 3871, 3
and
Start time of trip - start_time In 1530-1830
and
Trip purpose of destination - purp_dest In M

Trip 2016
Table:

,3862,3867,3871,3872
35,0,20,0,0
3607,0,0,14,0
3652,0,17,0,0
3653,0,0,12,0
3655,0,11,0,0
3668,0,0,30,0
3671,0,0,26,0
3673,25,0,0,0
3675,0,0,25,0
3694,0,0,29,0
3700,22,0,0,0
3707,0,0,32,0
3724,0,0,25,0
3851,27,0,0,27
3859,0,0,63,0
3867,0,0,39,0
3872,0,0,0,24
3874,0,0,49,0

Fri Apr 12 2024 11:49:48 GMT-0400 (Eastern Daylight Time) - Run Time: 2417ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA zone of origin - gta06_orig In 3862, 3867, 3871, 3872
and
Start time of trip - start_time In 1530-1830
and
Trip purpose of origin - purp_orig In M,

Trip 2016
Table:

,3862,3867,3871,3872
3485,0,0,0,8
3601,12,0,0,0
3607,0,0,18,0
3653,0,0,22,0
3655,0,11,0,0
3656,0,0,10,0
3658,0,0,15,0
3664,0,47,0,0
3665,0,0,49,0
3668,0,0,30,0
3671,0,17,26,0
3672,0,0,11,0
3675,0,0,25,0
3724,0,0,25,0
3863,0,0,12,0
3864,22,0,10,0
3867,0,0,39,0
4040,0,0,25,0

Tue Aug 27 2024 16:08:58 GMT-0400 (Eastern Daylight Time) - Run Time: 735ms

Cross Tabulation Query Form - Transit - 2016

Row: Route used on link #1 - route_1
Column: 2006 GTA zone of origin - gta06_orig

Filters:
Start time of trip - start_time In 0600-0930
and
2006 GTA zone of origin - gta06_orig In 3862,3667,3724,3723,3867,3666

Tran 2016
Table:

,3666,3667,3723,3724,3862,3867
GB40,0,0,0,12,0,0
GT01,0,11,0,0,0,0
GT02,14,15,74,21,49,238
MS01,11,39,18,0,34,0
MS03,0,0,0,133,0,0
MS101,0,0,0,0,0,159
MS103,0,0,0,12,48,0
MS19,0,0,64,52,122,223
MS28,0,0,0,0,0,140
MS304,0,0,0,27,0,0
MS53,0,0,0,45,0,0
MS91,0,0,0,0,0,19
T596,0,0,0,0,0,30

Wed Aug 28 2024 10:29:33 GMT-0400 (Eastern Daylight Time) - Run Time: 850ms

Cross Tabulation Query Form - Transit - 2016

Row: Route used on link #2 - route_2
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA zone of origin - gta06_orig In 3862,3667,3724,3723,3867,3666
and
Start time of trip - start_time In 0600-0930
and
Route used on link #1 - route_1 In MS103, MS19

Tran 2016
Table:

,3723,3724,3862,3867
Not Used,0,0,89,158
GB40,0,0,32,0
GT01,0,44,27,0
MS01,17,8,0,0
MS03,0,0,0,33
MS109,28,0,0,31
MS26,0,0,21,0
MS35,18,0,0,0
MS43,0,12,0,0

Wed Aug 28 2024 10:36:49 GMT-0400 (Eastern Daylight Time) - Run Time: 882ms

Cross Tabulation Query Form - Transit - 2016

Row: Route used on link #2 - route_2
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA zone of origin - gta06_orig In 3862,3667,3724,3723,3867,3666
and
Start time of trip - start_time In 0600-0930
and
Route used on link #1 - route_1 In MS01, MS03, MS101, MS28, MS53, MS91

Tran 2016
Table:

,3666,3667,3723,3724,3862,3867
Not Used,11,0,18,57,0,45
GB46,0,0,0,0,0,49
MS05,0,0,0,72,34,59
MS103,0,22,0,0,0,42
MS107,0,0,0,0,0,34
MS19,0,7,0,0,0,0
MS21,0,0,0,0,0,19
MS51,0,9,0,0,0,59
MS61,0,0,0,0,0,12
T596,0,0,0,48,0,0

APPENDIX K:

Signal Warrant Analysis

CROZIER

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
PER OTM BOOK 12

Project and Scenario Summary

Project	69 & 117 John Street	**Project Number**	2378-6557
		Date	2024-09-17
Horizon	2029 FT	**Analyst**	MY

Study Intersection Summary

Major Street	John Street	**Direction**	East/West
Minor Street	Jaguar Valley Drive	**Direction**	North/South

Intersection Details for Warrant Parameters

Flow Conditions	Restricted Flow (Urban)	**Number of Lanes**	1
T-Intersection?	Yes	**Intersection Type**	Existing

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	**Major: John Street**						**Minor: Jaguar Valley Drive**						**Pedestrians Crossing Major Street**
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	0	155	53	8	375	0	46	0	11	0	0	0	6
PM	0	210	58	6	257	0	59	0	30	0	0	0	27
AHV	0	91	28	4	158	0	26	0	10	0	0	0	8

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

Justification 7 - OTM Book 12

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	480	720	600	900	317	44.0%	14.1%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	180	255	180	255	36	14.1%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	480	720	600	900	281	39.0%	39.0%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	50	75	50	75	34	45.3%	
Applicable Threshold			X					

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 39.0%
Percentage Required to be Justified: 120%

Signal Justification 7 Met: [ ] Yes [X] No

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
PER OTM BOOK 12

Project and Scenario Summary

Project	69 & 117 John Street	**Project Number**	2378-6557
		Date	2024-09-17
Horizon	2029 FT	**Analyst**	MY

Study Intersection Summary

Major Street	Kirwin Avenue	**Direction**	East/West
Minor Street	Jaguar Valley Drive	**Direction**	North/South

Intersection Details for Warrant Parameters

Flow Conditions	Restricted Flow (Urban)	**Number of Lanes**	1
T-Intersection?	No	**Intersection Type**	New

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	**Major: Kirwin Avenue**						**Minor: Jaguar Valley Drive**						**Pedestrians Crossing Major Street**
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	21	202	18	7	150	10	14	21	10	21	30	20	8
PM	44	182	43	14	289	13	41	38	26	12	32	15	22
AHV	16	96	15	5	110	6	14	15	9	8	16	9	8

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

Justification 7 - OTM Book 12

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	480	720	600	900	319	44.3%	41.8%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	120	170	120	170	71	41.8%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	480	720	600	900	248	34.4%	34.4%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	50	75	50	75	46	61.3%	
Applicable Threshold			X					

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 41.8%
Percentage Required to be Justified: 150%

Signal Justification 7 Met: [ ] Yes [X] No

CROZIER

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
PER OTM BOOK 12

Project and Scenario Summary

Project	69 & 117 John Street	**Project Number**	2378-6557
		Date	2024-09-17
Horizon	2029 FT	**Analyst**	MY

Study Intersection Summary

Major Street	John Street	**Direction**	East/West
Minor Street	Little John Lane	**Direction**	North/South

Intersection Details for Warrant Parameters

Flow Conditions	Restricted Flow (Urban)	**Number of Lanes**	1
T-Intersection?	Yes	**Intersection Type**	Existing

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	**Major: John Street**						**Minor: Little John Lane**						**Pedestrians Crossing Major Street**
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	0	15	176	9	15	0	162	0	6	0	0	0	0
PM	0	20	139	5	17	0	242	0	12	0	0	0	0
AHV	0	9	79	4	8	0	101	0	5	0	0	0	0

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

Justification 7 - OTM Book 12

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	480	720	600	900	206	28.6%	28.6%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	180	255	180	255	106	41.6%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	480	720	600	900	100	13.9%	13.9%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	50	75	50	75	101	134.7%	
Applicable Threshold			X					

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 28.6%
Percentage Required to be Justified: 120%

Signal Justification 7 Met: [ ] **Yes** [X] **No**

CROZIER

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
PER OTM BOOK 12

Project and Scenario Summary

Project	69 & 117 John Street	**Project Number**	2378-6557
		Date	2024-09-17
Horizon	2029 FT	**Analyst**	MY

Study Intersection Summary

Major Street	Kirwin Avenue	**Direction**	East/West
Minor Street	Little John Lane	**Direction**	North/South

Intersection Details for Warrant Parameters

Flow Conditions	Restricted Flow (Urban)	**Number of Lanes**	1
T-Intersection?	Yes	**Intersection Type**	Existing

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	**Major: Kirwin Avenue**						**Minor: Little John Lane**						**Pedestrians Crossing Major Street**
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	25	225	0	0	131	153	0	0	0	183	0	16	16
PM	40	180	0	0	313	247	0	0	0	119	0	15	20
AHV	16	101	0	0	111	100	0	0	0	76	0	8	9

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

Justification 7 - OTM Book 12

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	480	720	600	900	412	57.2%	32.9%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	180	255	180	255	84	32.9%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	480	720	600	900	328	45.6%	45.6%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	50	75	50	75	85	113.3%	
Applicable Threshold			X					

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 45.6%
Percentage Required to be Justified: 120%

Signal Justification 7 Met: [ ] Yes [X] No

CROZIER

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
PER OTM BOOK 12

Project and Scenario Summary

Project	69 & 117 John Street	**Project Number**	2378-6557
		Date	2024-09-17
Horizon	2029 FT	**Analyst**	MY

Study Intersection Summary

Major Street	John Street	**Direction**	East/West
Minor Street	West Site Access	**Direction**	North/South

Intersection Details for Warrant Parameters

Flow Conditions	Restricted Flow (Urban)	**Number of Lanes**	1
T-Intersection?	Yes	**Intersection Type**	New

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	**Major: John Street**						**Minor: West Site Access**						**Pedestrians Crossing Major Street**
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	0	166	0	0	134	0	0	0	0	99	0	248	0
PM	0	240	0	0	150	0	0	0	0	66	0	109	0
AHV	0	102	0	0	71	0	0	0	0	41	0	89	0

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

Justification 7 - OTM Book 12

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	480	720	600	900	303	42.1%	42.1%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	180	255	180	255	130	51.0%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	480	720	600	900	173	24.0%	24.0%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	50	75	50	75	41	54.7%	
Applicable Threshold			X					

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 42.1%
Percentage Required to be Justified: 150%

Signal Justification 7 Met: [ ] **Yes** [X] **No**

CROZIER

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
PER OTM BOOK 12

Project and Scenario Summary

Project	69 & 117 John Street	**Project Number**	2378-6557
		Date	2024-09-17
Horizon	2029 FT	**Analyst**	MY

Study Intersection Summary

Major Street	John Street	**Direction**	East/West
Minor Street	East Site Access	**Direction**	North/South

Intersection Details for Warrant Parameters

Flow Conditions	Restricted Flow (Urban)	**Number of Lanes**	1
T-Intersection?	Yes	**Intersection Type**	New

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	**Major: John Street**						**Minor: East Site Access**						**Pedestrians Crossing Major Street**
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	71	192	0	0	134	43	0	0	0	0	0	0	3
PM	140	166	0	0	150	109	0	0	0	0	0	0	2
AHV	53	90	0	0	71	38	0	0	0	0	0	0	1

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

Justification 7 - OTM Book 12

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	480	720	600	900	252	35.0%	0.0%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	180	255	180	255	0	0.0%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	480	720	600	900	252	35.0%	1.3%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	50	75	50	75	1	1.3%	
Applicable Threshold			X					

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 1.3%
Percentage Required to be Justified: 150%

Signal Justification 7 Met: [ ] Yes [X] No

APPENDIX L:

All-Way Stop Control Warrant Analysis

ALL-WAY STOP CONTROL (AWSC) WARRANTS (OTM BOOK 5)

Horizon Year and Analysis Period 2029 Future Total

PROJECT INFORMATION

Analyst MY
Company C.F. Crozier & Associates
Date 2024-09-17

Jurisdiction City of Mississauga
Project Name 69 & 117 John Street
Project No. 2378-6557

ROADWAY INFORMATION

East-West Street John Street
North-South Street Little John Lane
Roadway Classification (Minor Street) Local Roads

Major Street East-West
Number of legs 3

TRAFFIC VOLUMES

Peak Hour	Major Road Approaches							Minor Road Approaches							Pedestrian Crossing Major Road	Pedestrian Crossing Minor Road
	Eastbound			Westbound			Total	Northbound			Southbound			Total		
	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT			
AM	0	15	176	9	15	0	215	162	0	6	0	0	0	168	3	11
PM	0	20	139	5	17	0	181	242	0	12	0	0	0	254	2	12
AHV	0	9	79	4	8	0	99	101	0	5	0	0	0	106	5	23

Parameter	AM	PM	AHV	Threshold	
Total vehicle volume on all intersection approaches	383	435	206	200	veh
Combined vehicle and pedestrian volumes on minor street	179	266	129	75	veh
Combined vehicle and pedestrian volumes on minor street + minor street delay*				N/A	veh
			0	N/A	s
Volume Split, Minor Road (vehicles only)	0.44	0.58	0.51	0.25	

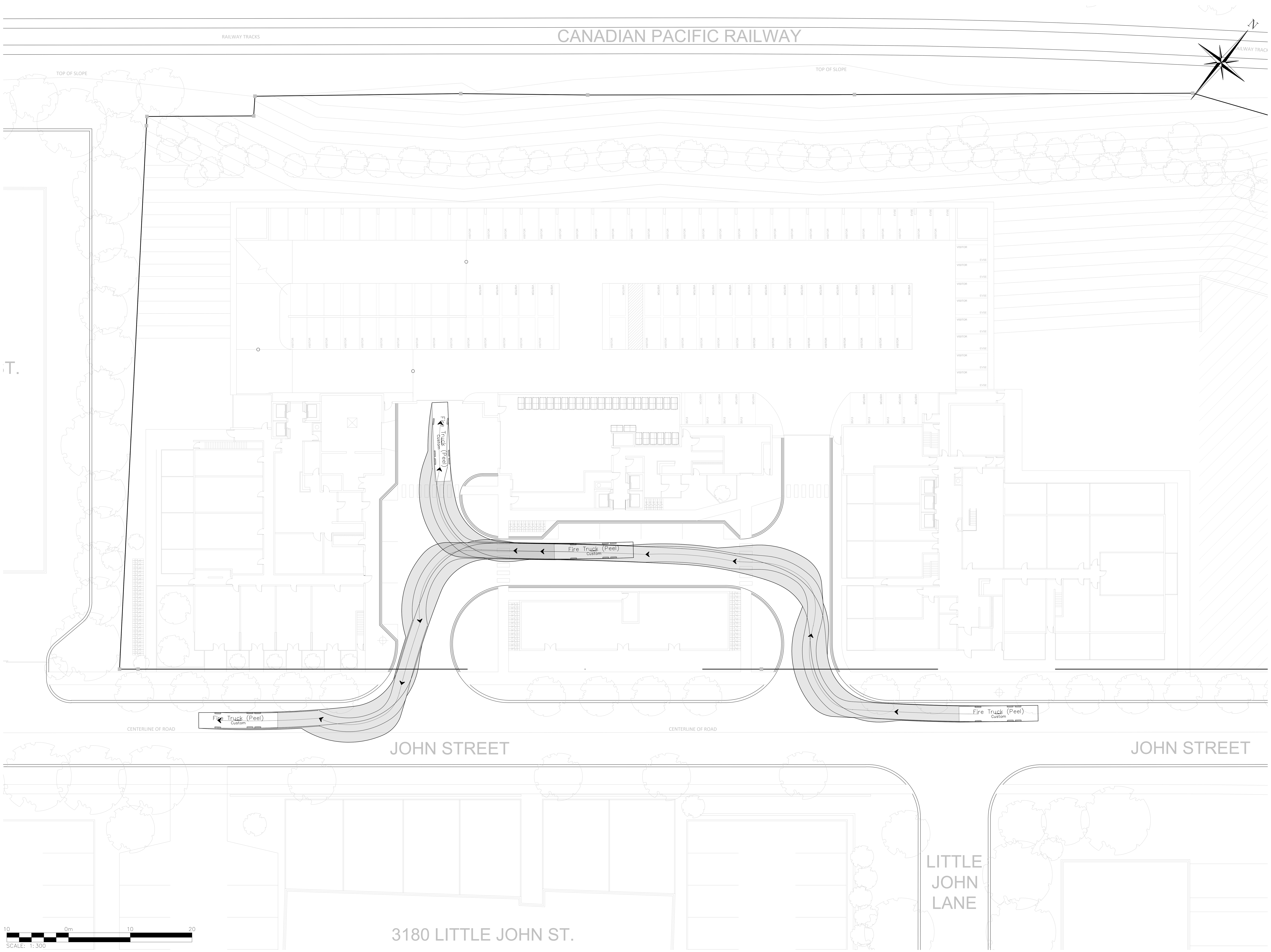
Justification 1: Total Vehicle Volume on all Intersection Approaches **Justified?** YES
Justification 2A: Combined Vehicle and Pedestrian Volumes on minor street **Justified?** YES
Justification 2B: Combined Vehicle and Pedestrian Volumes + Delay on minor street **Justified?** YES
Justification 3: Volume Split (vehicles only) **Justified?** YES

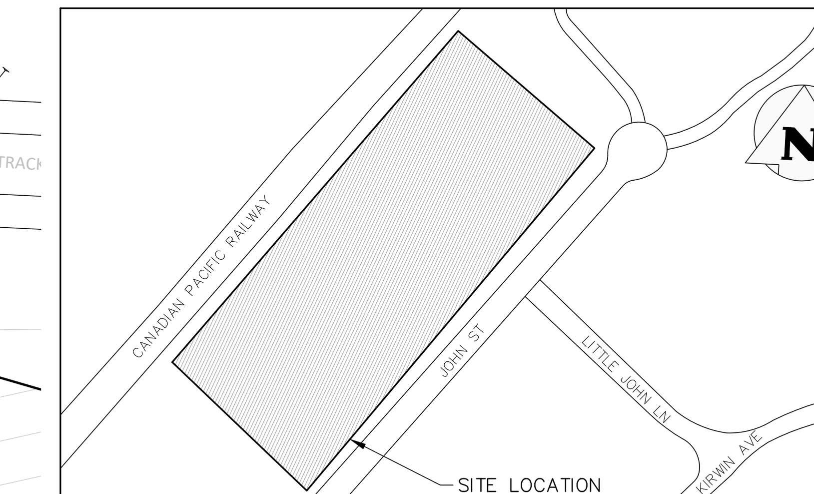
Conclusion: The results of the calculations show that All-Way Stop Control at this intersection is justified for the 2029 Future Total analysis period.

* Minor Approach Delay under minor stop control using the "AHV" volumes. Delay must be >30s not just for the AM/PM peak, but for the busiest 8 hours of the day to trigger the threshold for Justification 2B.
The All-Way Stop Control justification was done per criteria defined within the Ontario Traffic Manual, Book 5 (December 2021), "All-Way Stop Minimum Volume Warrants"

APPENDIX M:

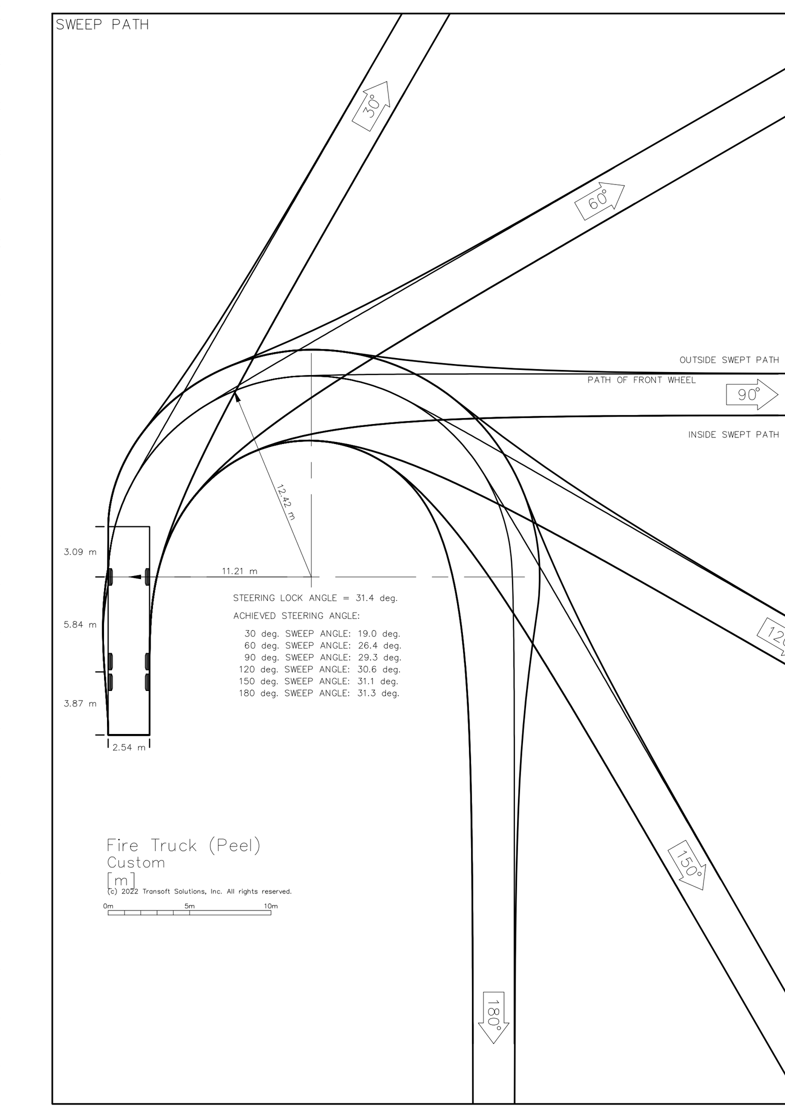
Vehicle Turning Diagrams

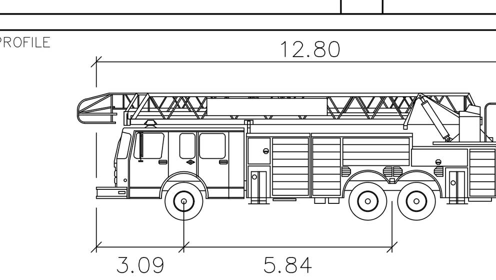




KEY PLAN
SCALE: N.T.S.

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION





Fire Truck (Peel)

meters

Width	: 2.54
Track	: 2.54
Lock to Lock Time	: 6.0
Steering Angle	: 31.4

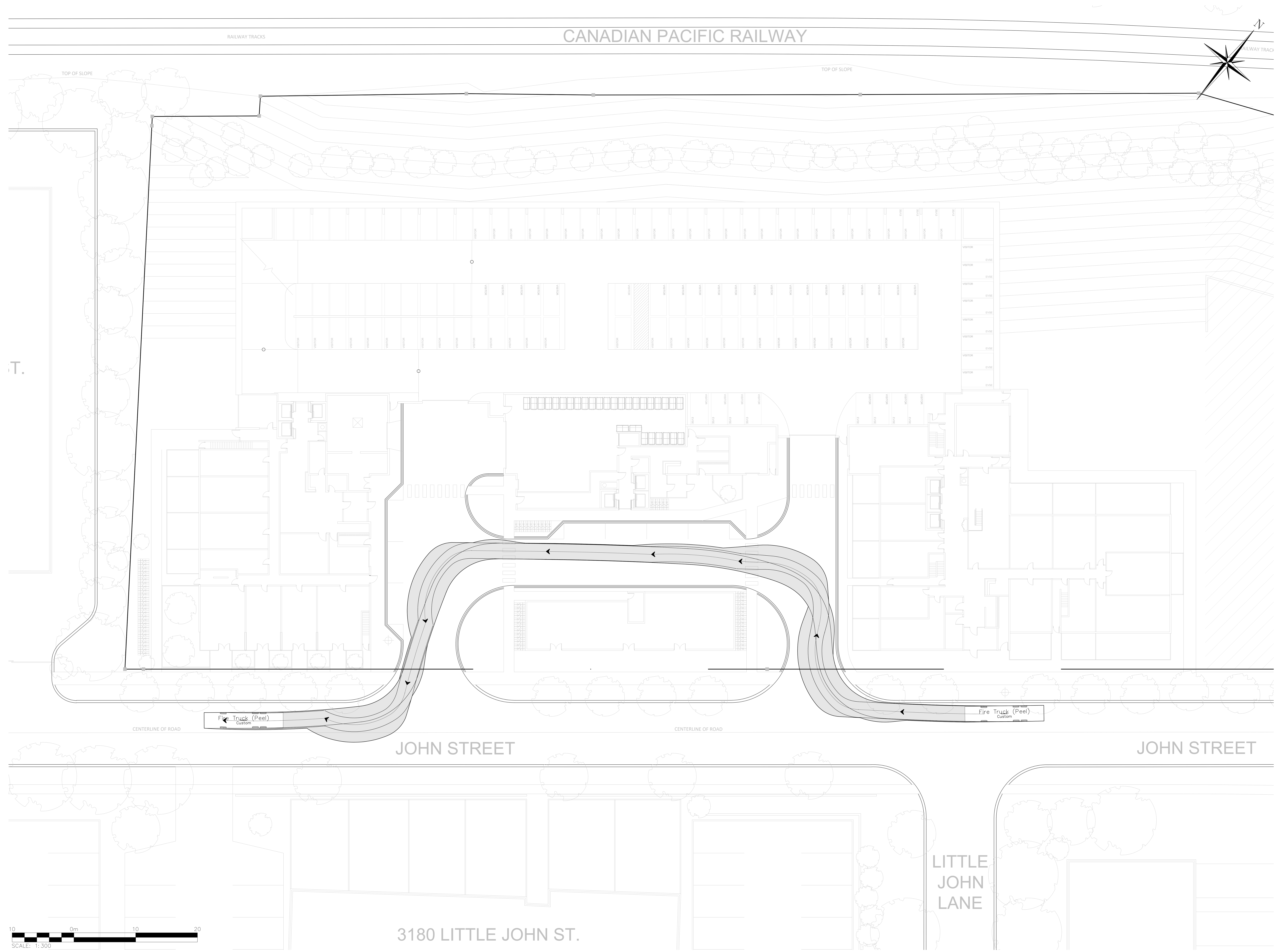
No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	04/23/2024
2	ISSUED FOR 2nd SUBMISSION	09/13/2024

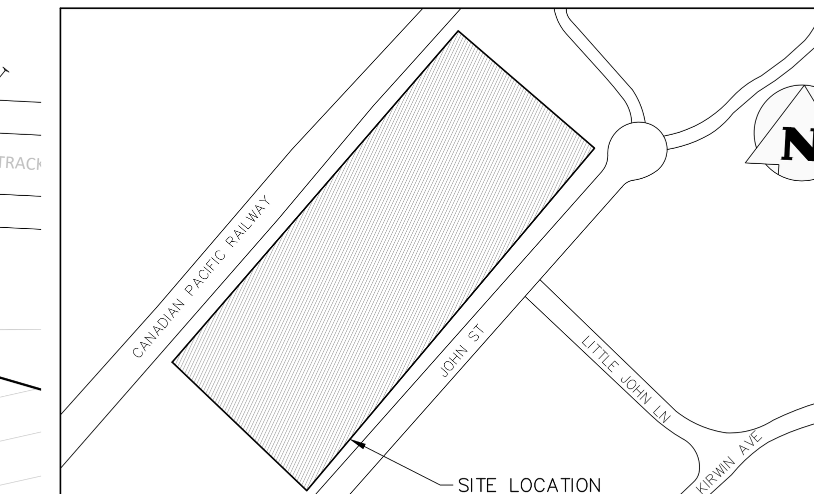
Project
69 & 117 JOHN STREET
CITY OF MISSISSAUGA

Drawing
GROUND FLOOR
FIRE TRUCK
VEHICLE MANEUVERING ANALYSIS

CROZIER
CONSULTING ENGINEERS
211 Yonge Street
Suite 600
Toronto, ON, M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By: R.L./T.D.S.	Design By	Project	2378-6557
Check By: R.L.	Check By	Scale: 1:300	Drawing: T300

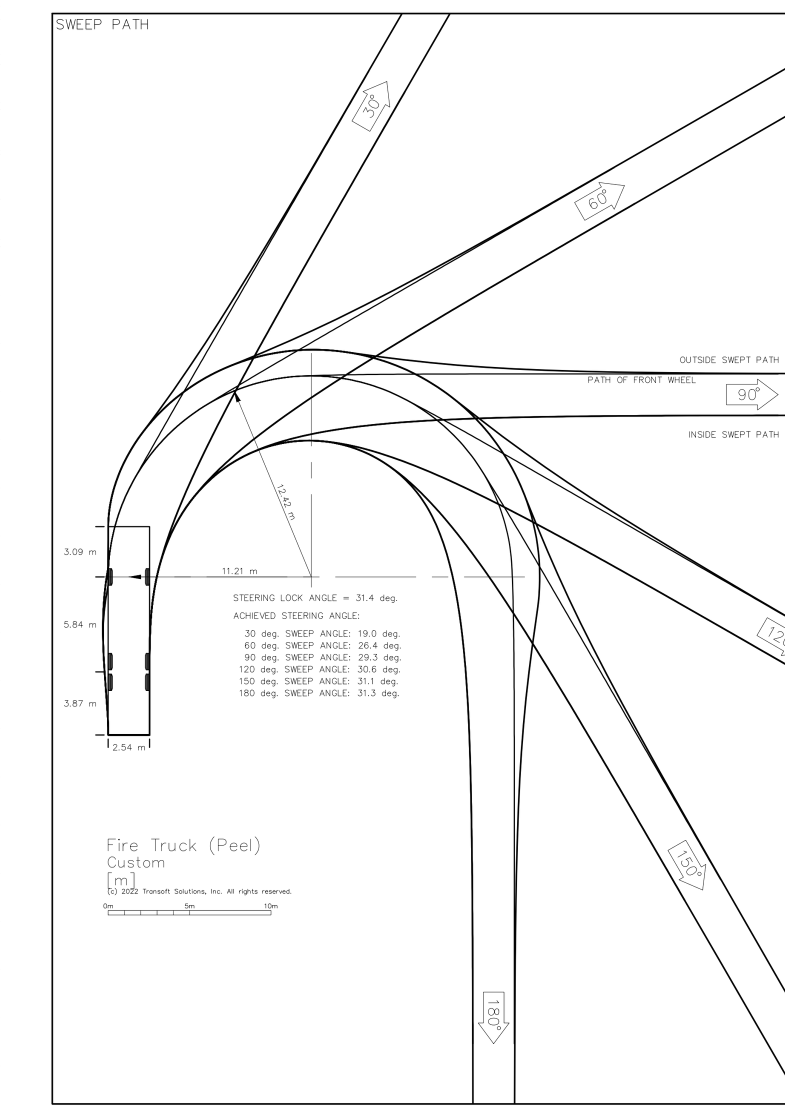




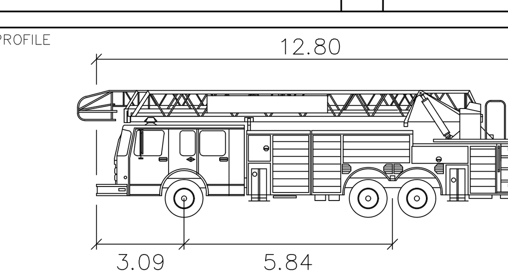
KEY PLAN
SCALE: N.T.S.

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



Fire Truck (Peel)

	meters
Width	: 2.54
Track	: 2.54
Lock to Lock Time	: 6.0
Steering Angle	: 31.4

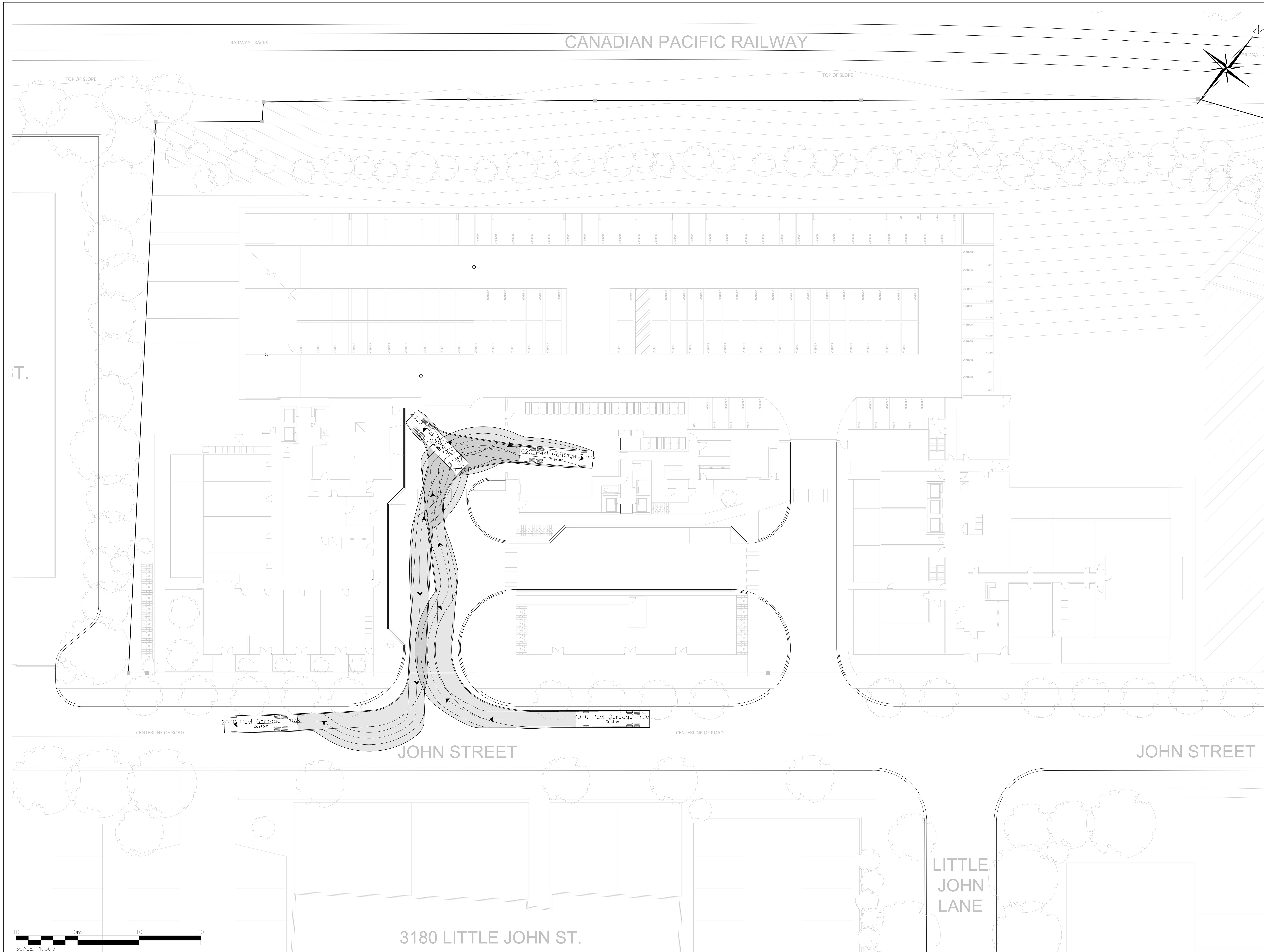
No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	04/23/2024
2	ISSUED FOR 2nd SUBMISSION	09/13/2024

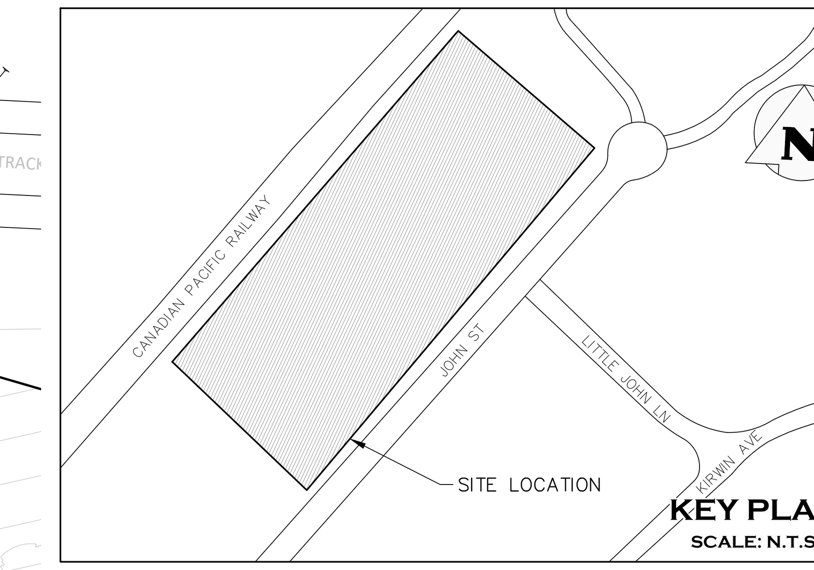
Project
69 & 117 JOHN STREET
CITY OF MISSISSAUGA

Drawing
GROUND FLOOR
FIRE TRUCK
VEHICLE MANEUVERING ANALYSIS

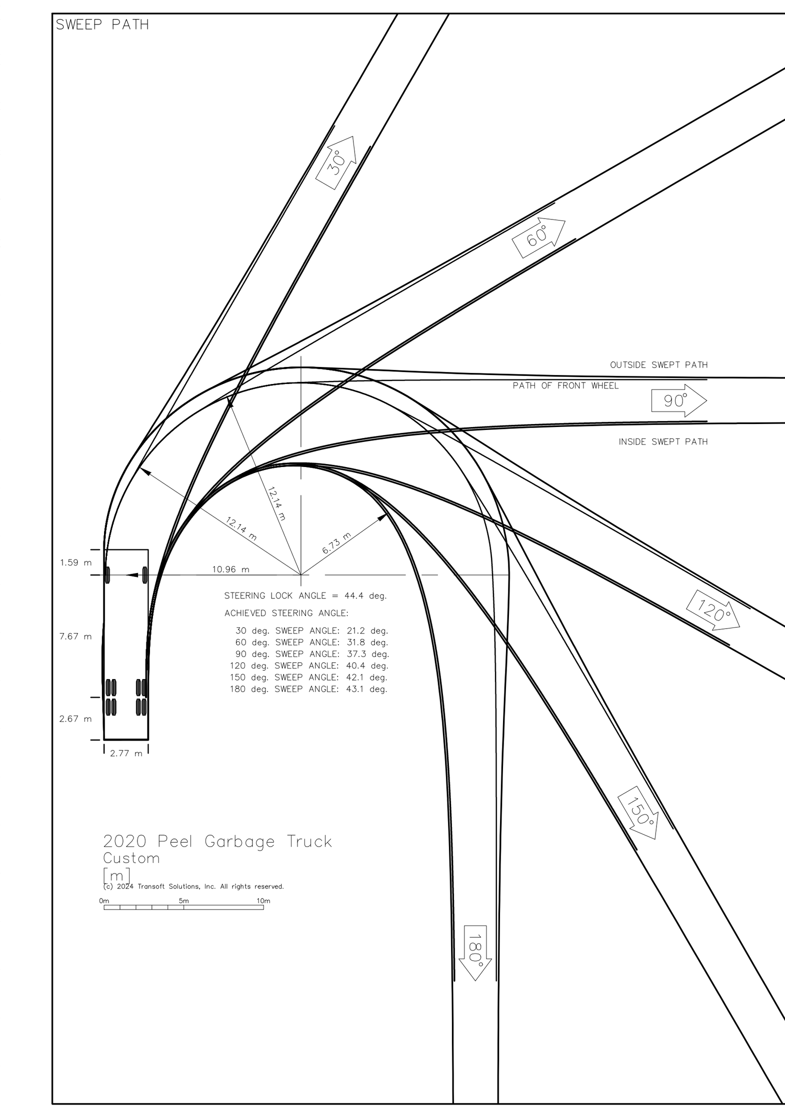
CROZIER
CONSULTING ENGINEERS
211 Yonge Street
Suite 600
Toronto, ON, M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

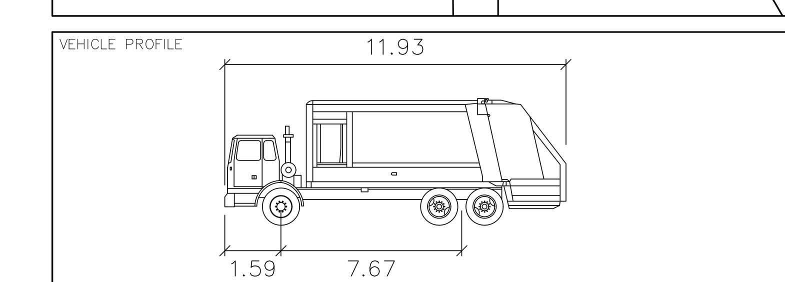
Drawn By R.L./T.D.S.	Design By	Project 2378-6557	
Check By R.L.	Check By	Scale 1:300	Drawing T301





FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION





2020 Peel Garbage Truck

meters

Width	: 2.77
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 44.4

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	04/23/2024
2	ISSUED FOR 2nd SUBMISSION	09/13/2024

Project
69 & 117 JOHN STREET
CITY OF MISSISSAUGA

Drawing
GROUND FLOOR
GARBAGE TRUCK
VEHICLE MANEUVERING ANALYSIS

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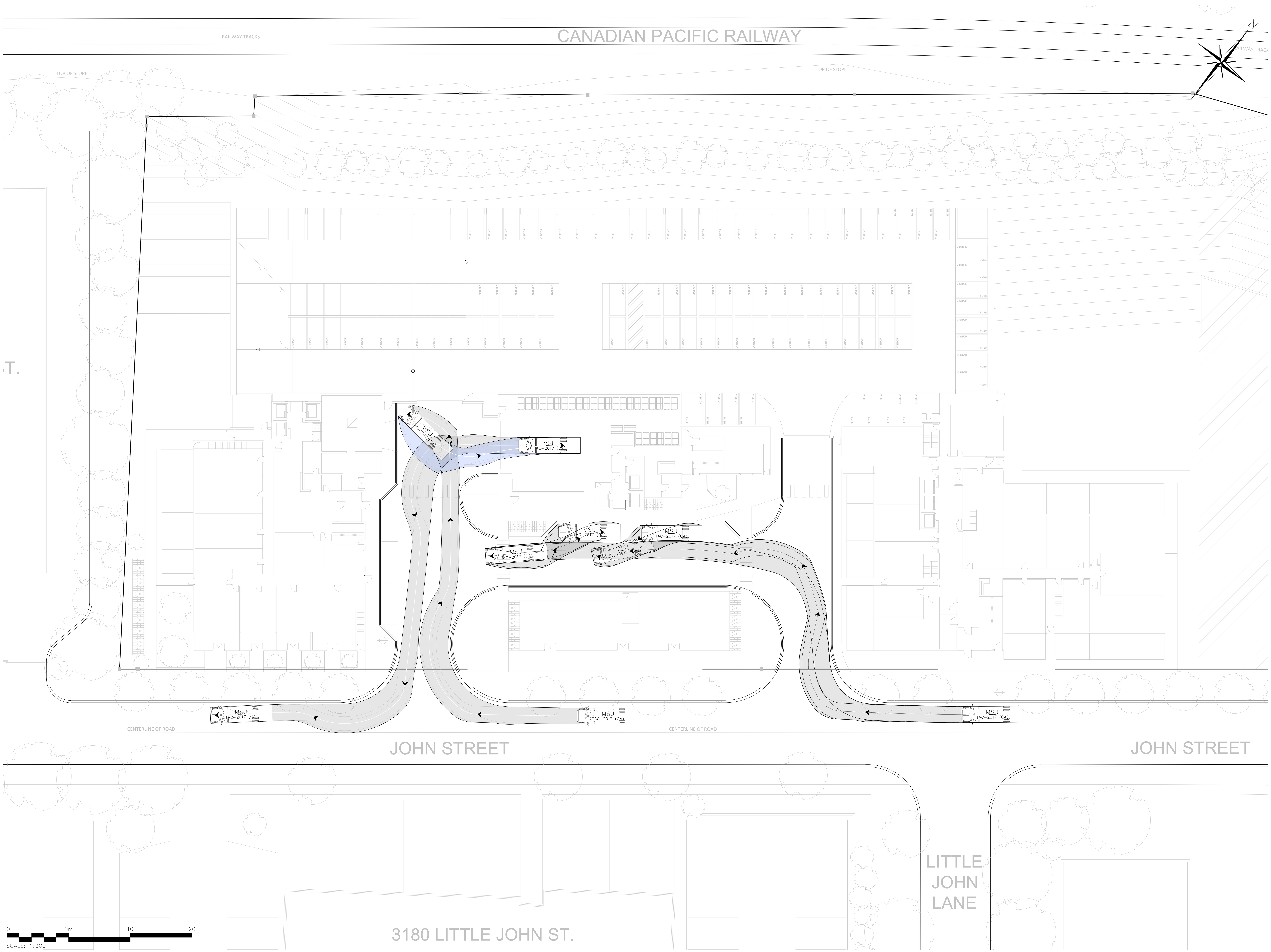

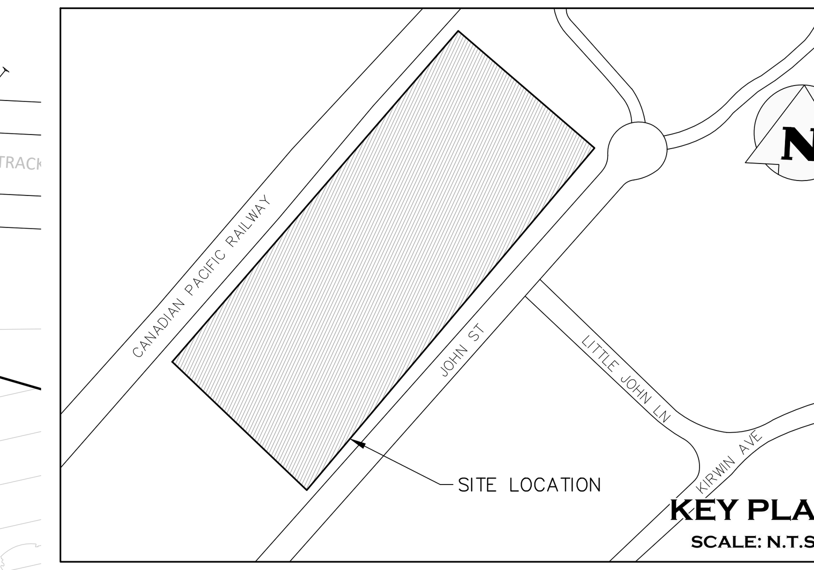

KEY PLAN
SCALE: N.T.S.

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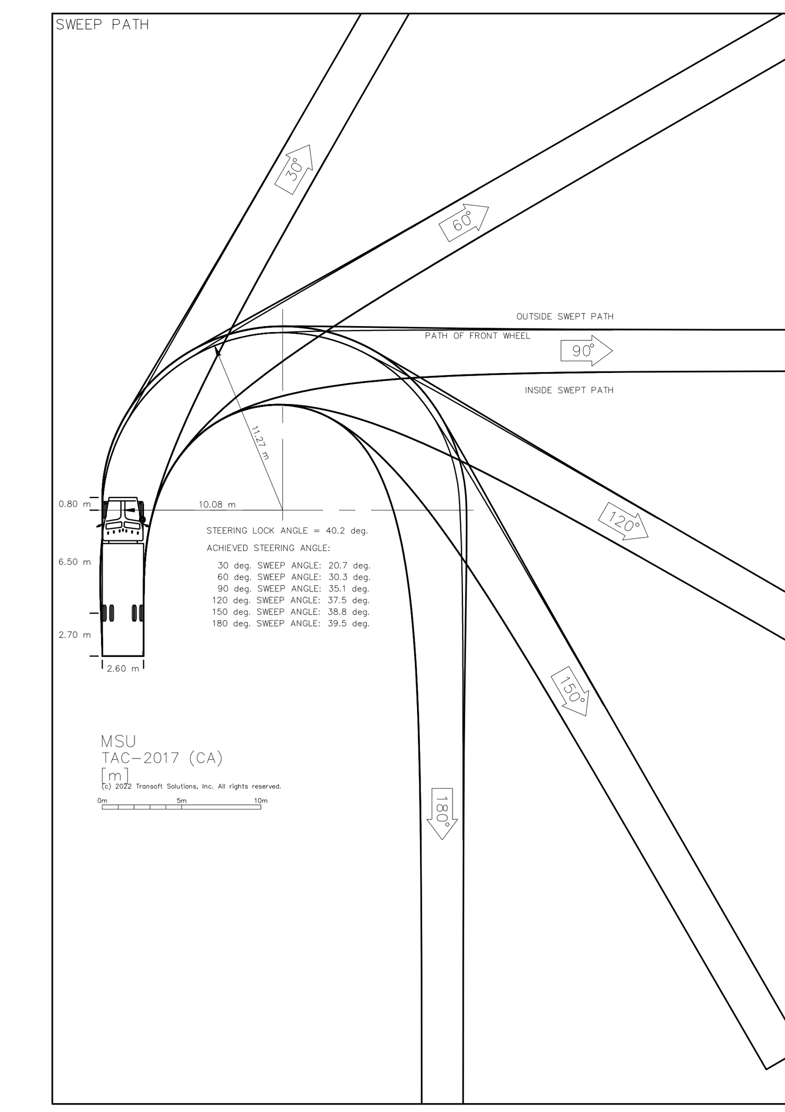

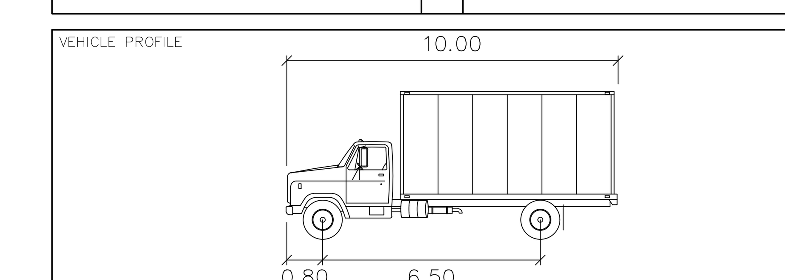

MSU

		meters
Width	:	2.60
Track	:	2.60
Lock to Lock Time	:	6.0
Steering Angle	:	40.2

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	04/23/2024
2	ISSUED FOR 2nd SUBMISSION	09/13/2024

Project

69 & 117 JOHN STREET
CITY OF MISSISSAUGA

Drawing

GROUND FLOOR
MEDIUM SINGLE UNIT (MSU)
VEHICLE MANEUVERING ANALYSIS

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Drawn By R.L./T.D.S.	Design By	Project 2378-6557	
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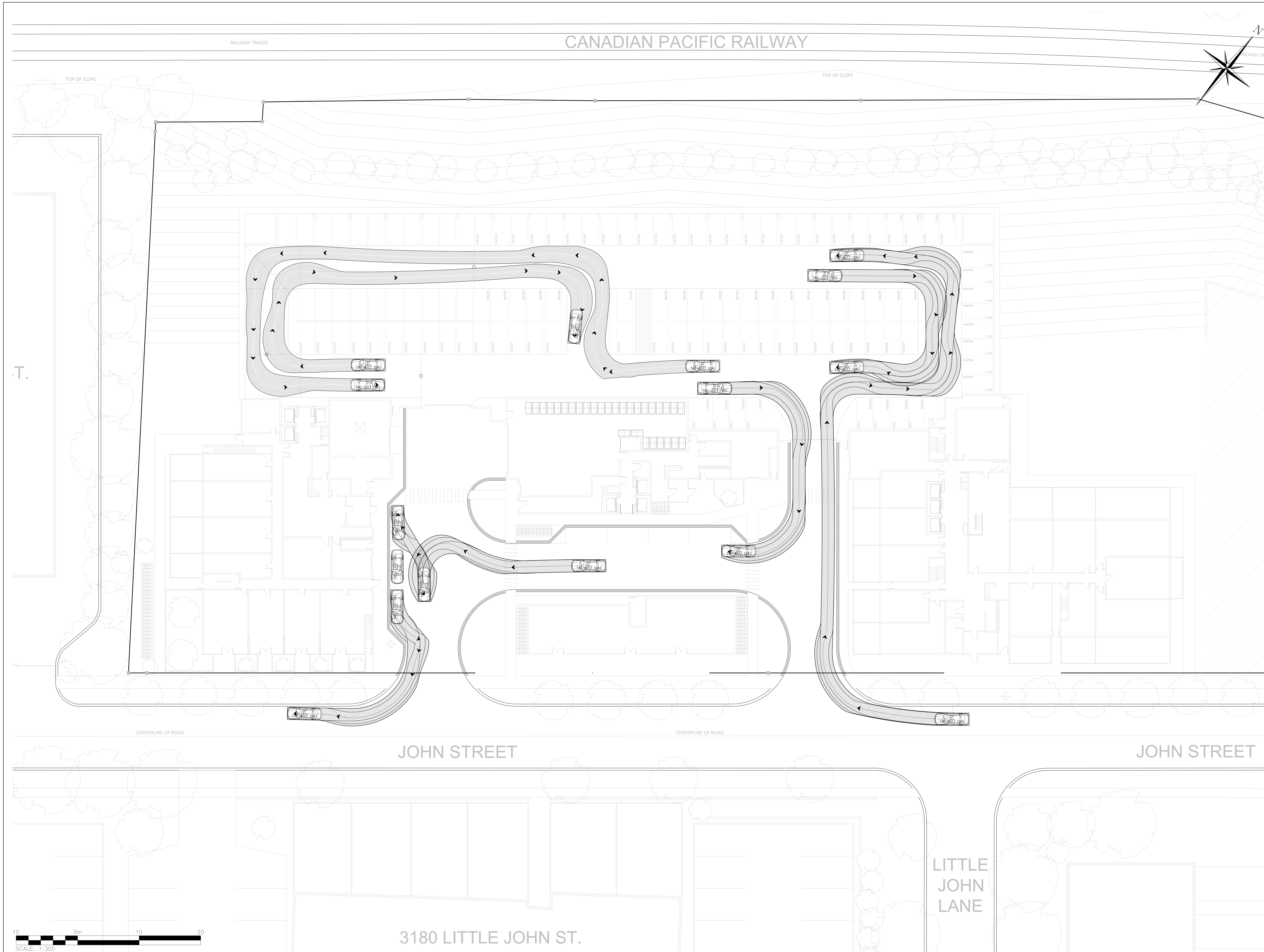
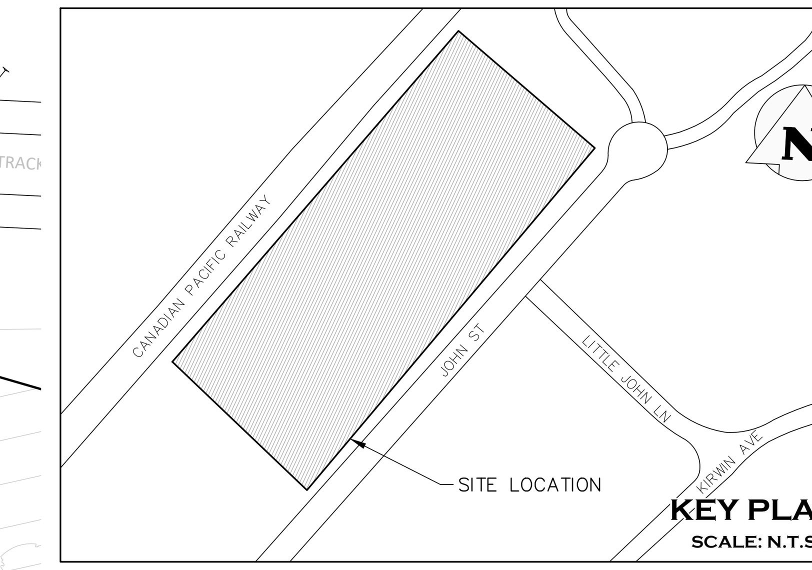
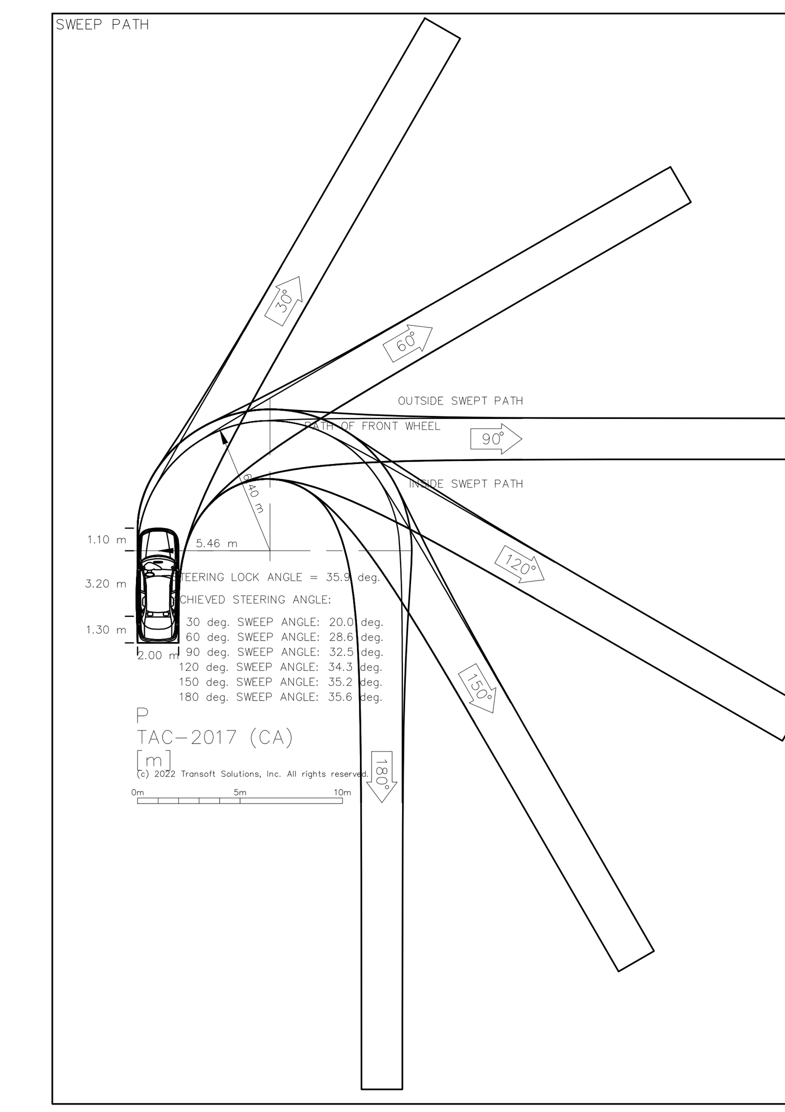
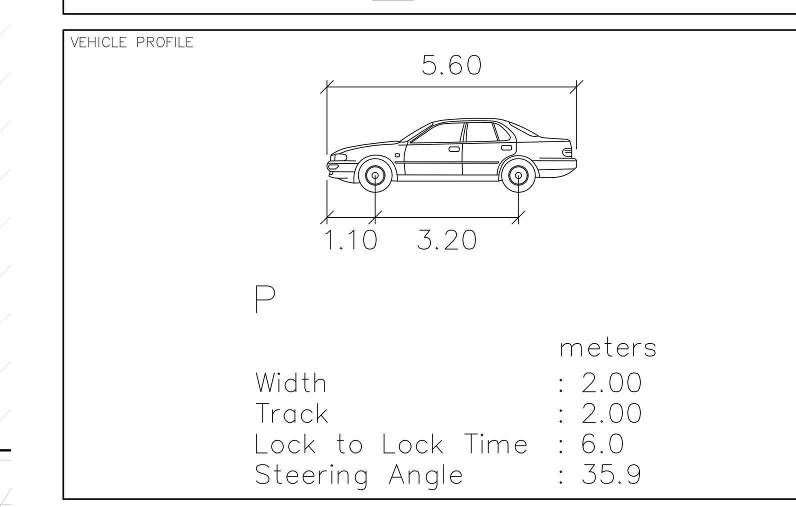




FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION





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2	ISSUED FOR 2nd SUBMISSION	09/13/2024

Project

69 & 117 JOHN STREET
CITY OF MISSISSAUGA

Drawing

GROUND FLOOR
PASSENGER VEHICLE
VEHICLE MANEUVERING ANALYSIS

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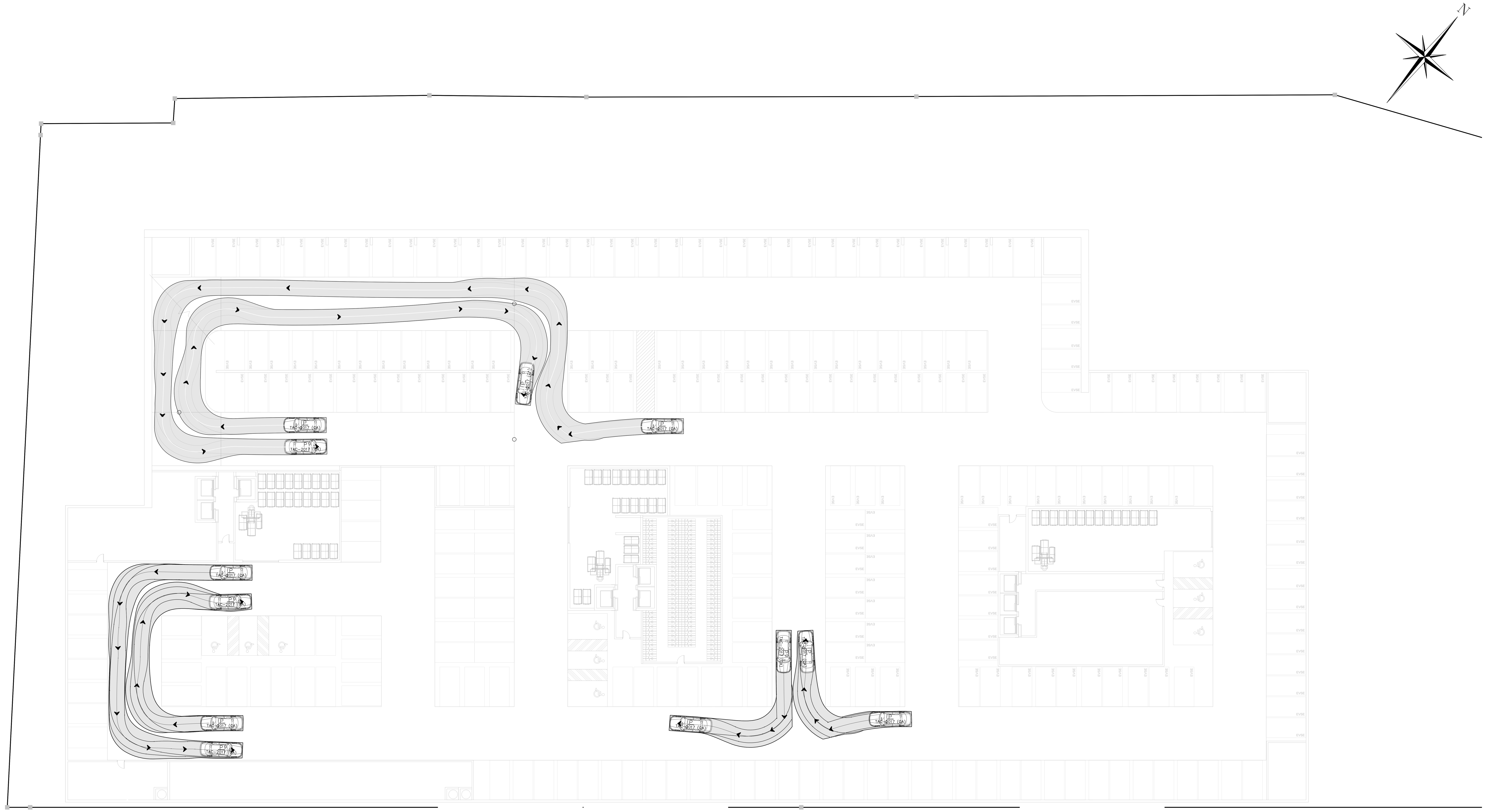
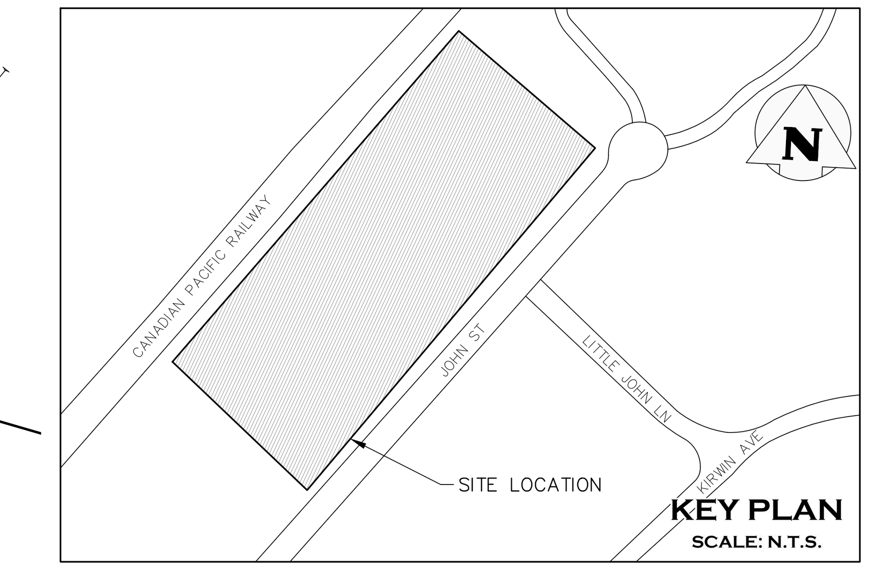
Check By R.L.	Check By	Scale 1:300	Drawing T304

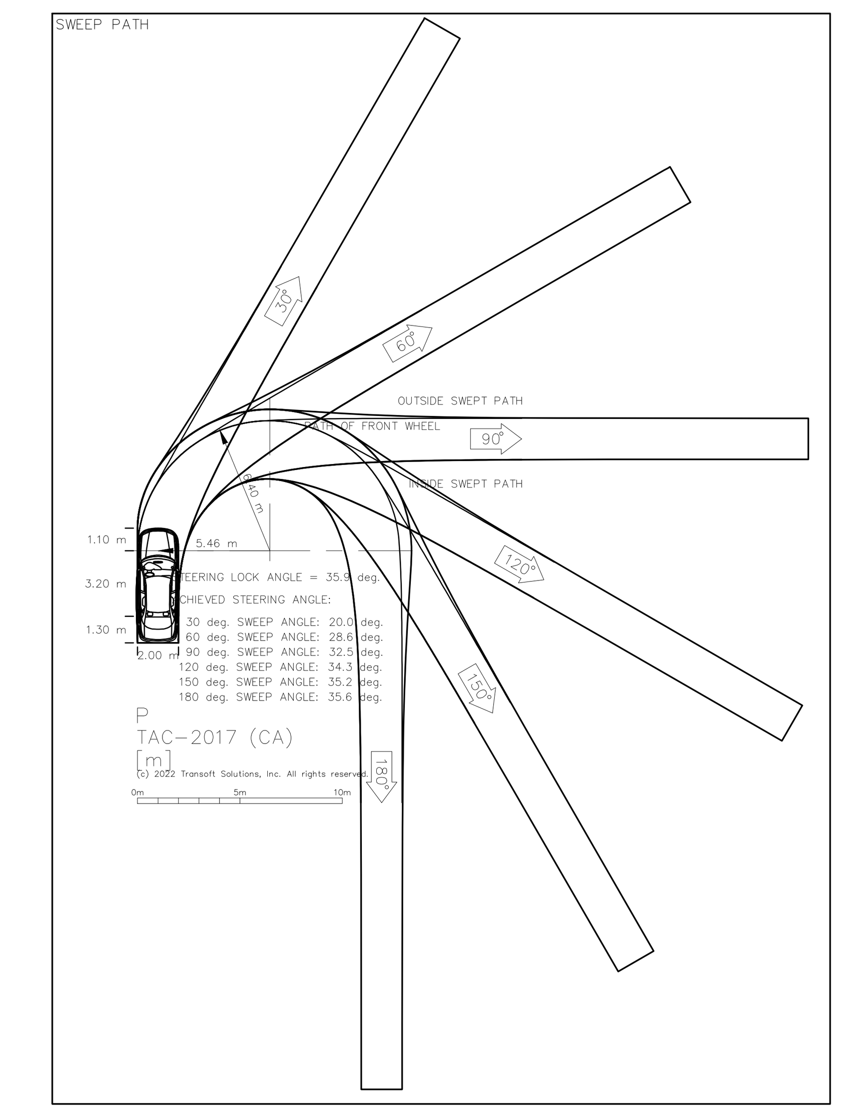




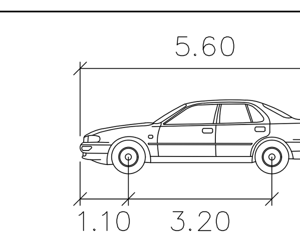
KEY PLAN
SCALE: N.T.S.

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



P

		meters
Width	:	2.00
Track	:	2.00
Lock to Lock Time	:	6.0
Steering Angle	:	35.9

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	04/23/2024
2	ISSUED FOR 2nd SUBMISSION	09/13/2024

Project

69 & 117 JOHN STREET
CITY OF MISSISSAUGA

Drawing

PARKING LEVEL P1
PASSENGER VEHICLE
VEHICLE MANEUVERING ANALYSIS

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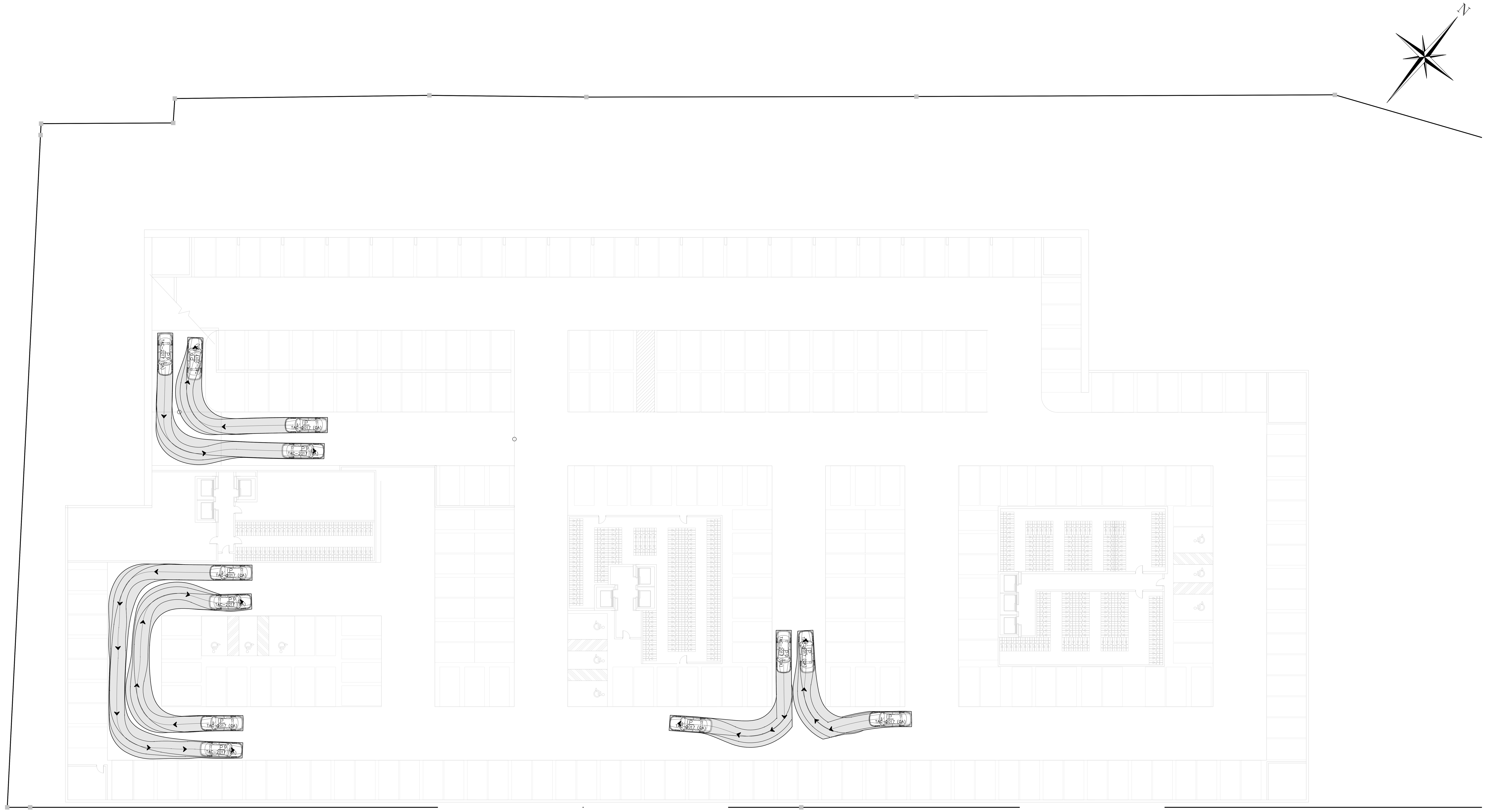
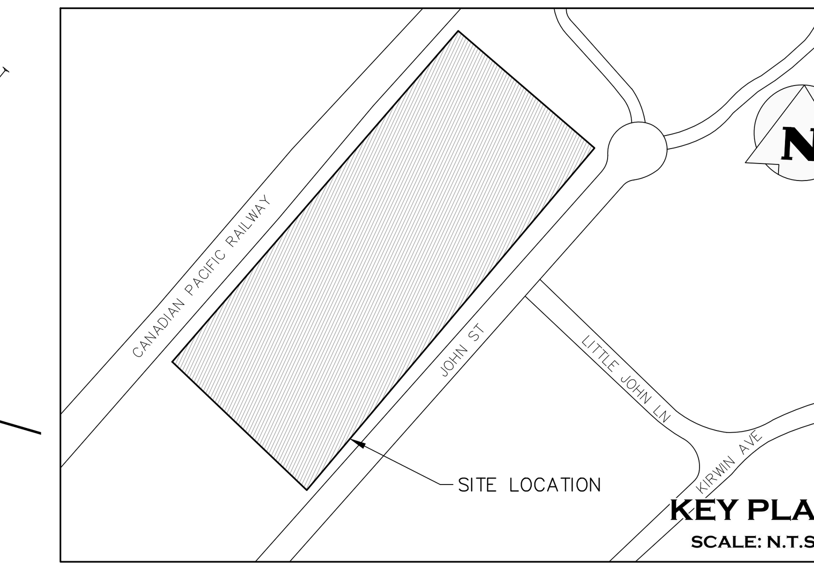
Drawn By	Design By	Project	
R.L./T.D.S.		2378-6557	
Check By	Check By	Scale	Drawing
R.L.		1:300	T305

10 0m 10 20
SCALE: 1:300

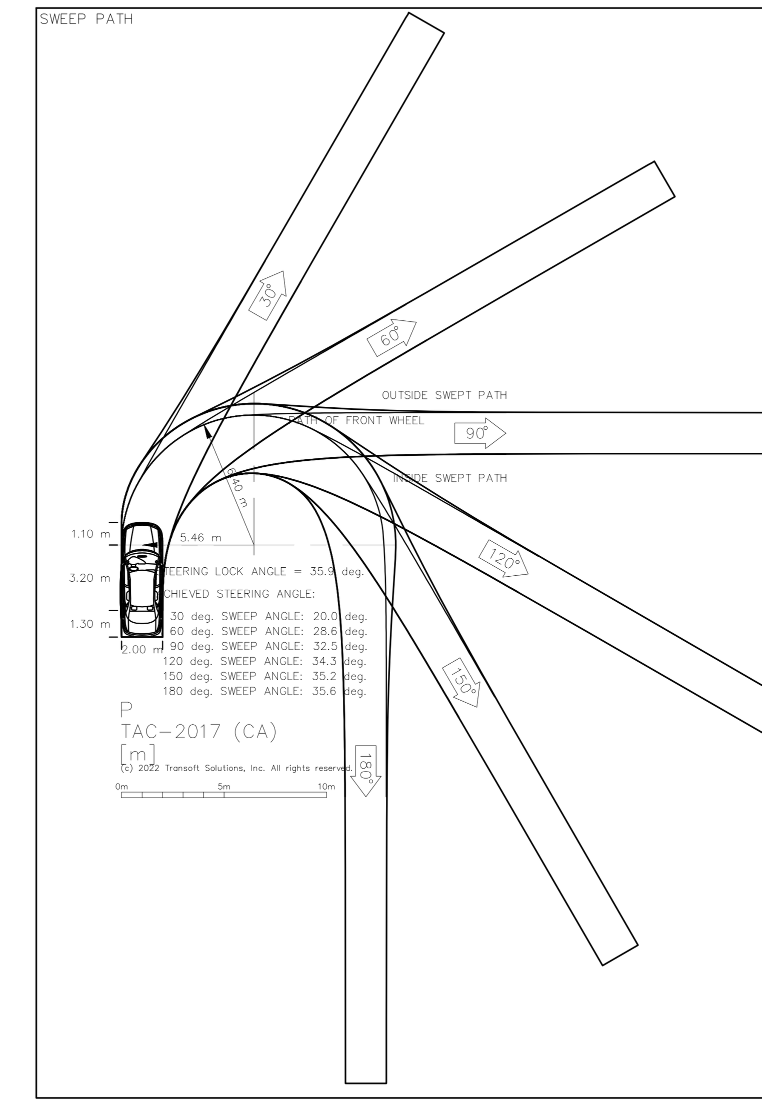




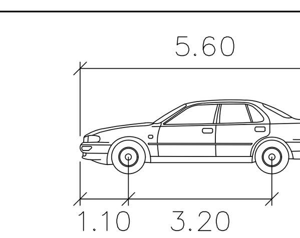
KEY PLAN
SCALE: N.T.S.

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



P

		meters
Width	:	2.00
Track	:	2.00
Lock to Lock Time	:	6.0
Steering Angle	:	35.9

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	04/23/2024
2	ISSUED FOR 2nd SUBMISSION	09/13/2024

Project
69 & 117 JOHN STREET
CITY OF MISSISSAUGA

Drawing
PARKING LEVEL P2
PASSENGER VEHICLE
VEHICLE MANEUVERING ANALYSIS

CROZIER
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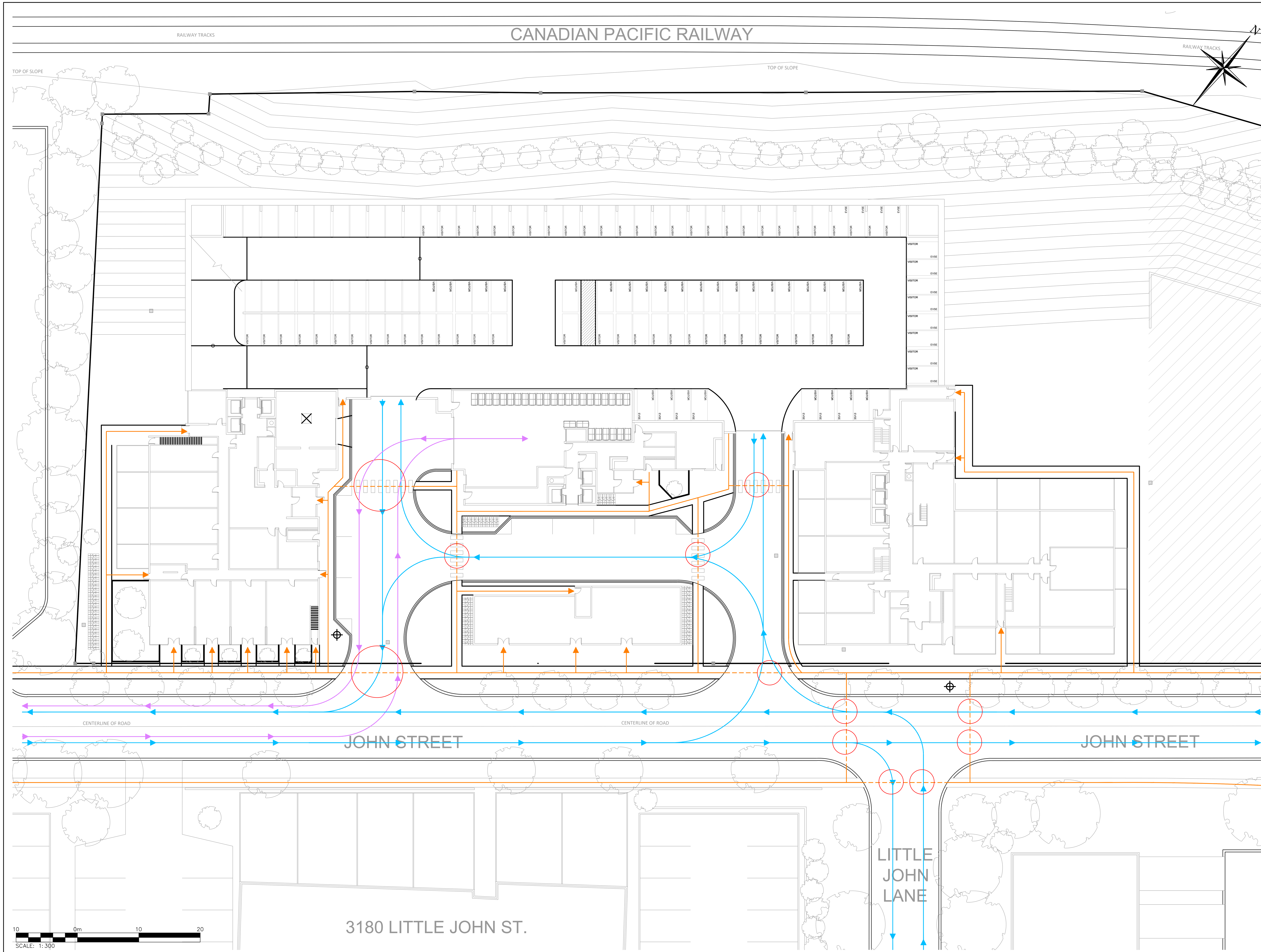
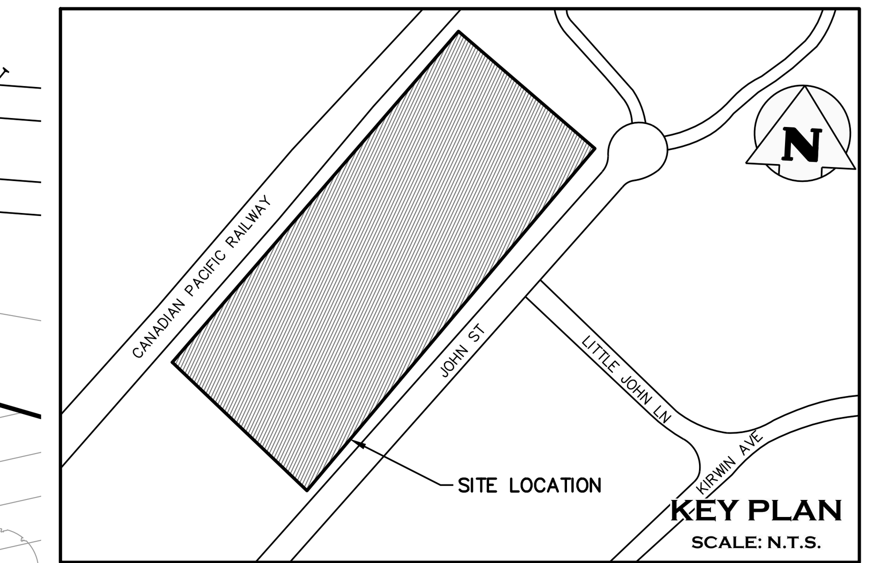
Drawn By	R.L./T.D.S.	Design By		Project	2378-6557
Check By	R.L.	Check By		Scale 1:300	Drawing T306

SCALE: 1:300

APPENDIX N:

Pedestrian Circulation Plan





FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

LEGEND

- VEHICLE PATH
- TRUCK PATH
- SIDEWALK
- CROSSWALK
- PEDESTRIAN–VEHICLE INTERACTION

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	04/23/2024
2	ISSUED FOR 2nd SUBMISSION	09/17/2024

Project
69 & 117 JOHN STREET
CITY OF MISSISSAUGA

Drawing
SITE CIRCULATION PLAN

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Check By M.Y.	Check By M.L.	Scale 1:300	Drawing T200

APPENDIX O:

TAC GDGCR Excerpts

Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance.

$$SSD = 0.278Vt + 0.039\frac{V^2}{a} \quad (2.5.2)$$

Where:

SSD = Stopping sight distance (m)
t = Brake reaction time, 2.5 s
V = Design speed (km/h)
a = Deceleration rate (m/s^2)

Table 2.5.2 gives the minimum stopping sight distances on level grade, on wet pavement, for a range of design speeds. These values are used for vertical curve design, intersection geometry and the placement of traffic control devices. The stopping sight distances quoted in **Table 2.5.2** may need to be increased for a variety of reasons related to grade and vehicle type as noted below.

Table 2.5.2: Stopping Sight Distance on level roadways for Automobiles[54]

Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Stopping sight distance	
			Calculated (m)	Design (m)
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65
60	41.7	41.3	83.0	85
70	48.7	56.2	104.9	105
80	55.6	73.4	129.0	130
90	62.6	92.9	155.5	160
100	69.5	114.7	184.2	185
110	76.5	138.8	215.3	220
120	83.4	165.2	248.6	250
130	90.4	193.8	284.2	285

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s^2 used to determine calculated sight distance.

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278\, V_{major}\, t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

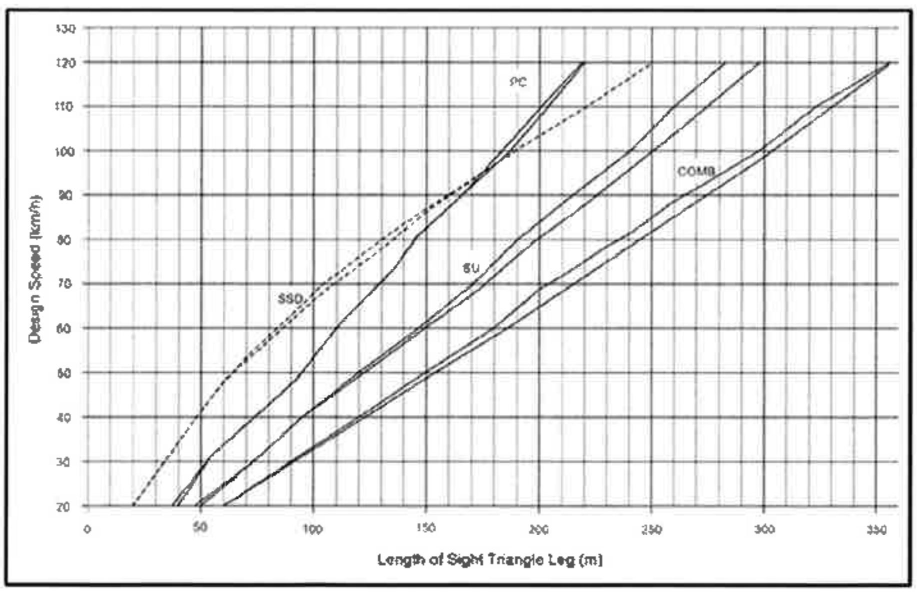


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)

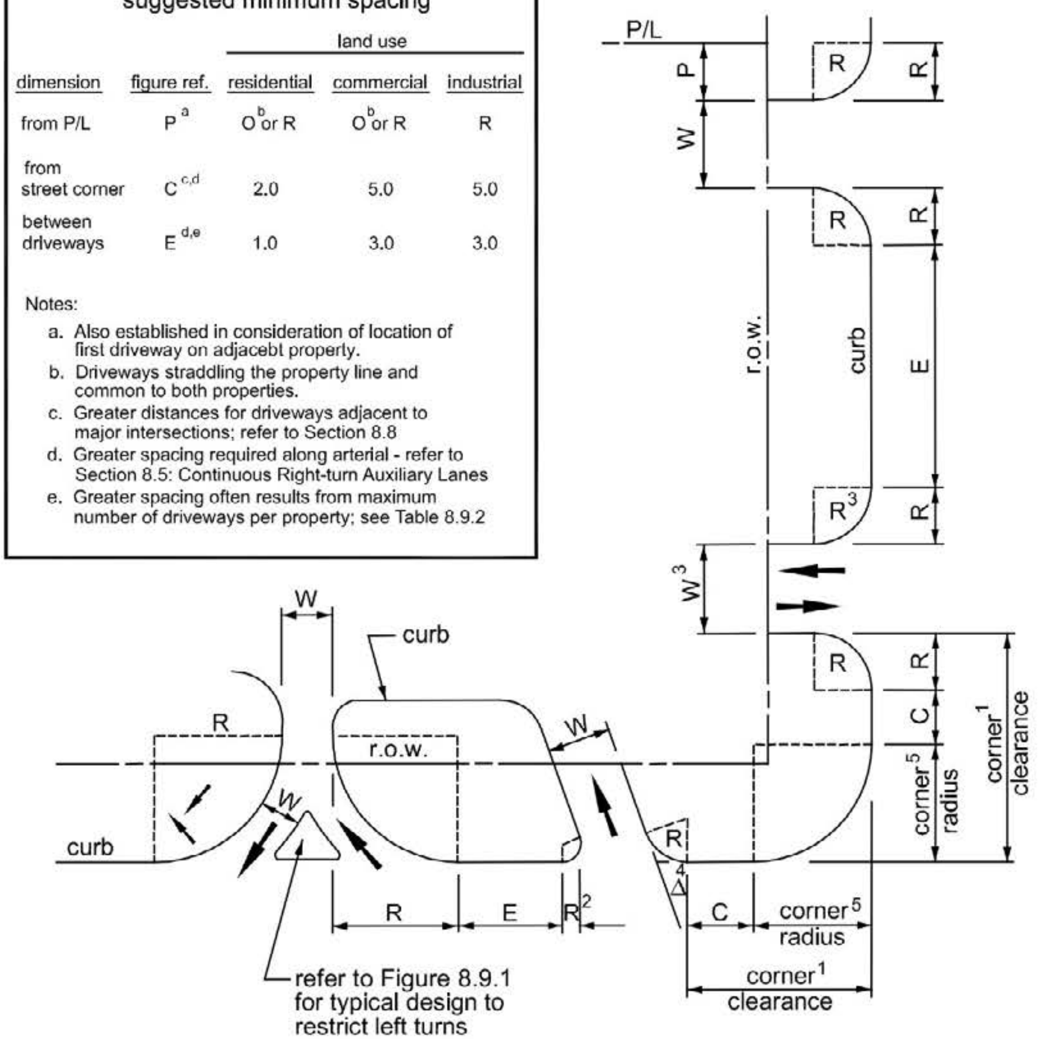
collector roadways, while a 3.0 m minimum is the suggested dimension for both commercial and industrial land uses. If there is a need to provide parallel parking between driveways along the roadway, a spacing of 6.0 to 7.5 m is suitable. If the spacing provided is in the range of 3.0 to 5.0 m, the space may appear inviting to a driver wishing to park, but if used, severely hampers the operation of the driveways by reducing sight lines and interfering with the turning paths of the vehicles.

suggested minimum spacing

dimension	figure ref.	land use: residential	land use: commercial	land use: industrial
from P/L	P [a]	O [b] or R	O [b] or R	R
from street corner	C [c,d]	2.0	5.0	5.0
between driveways	E [d,e]	1.0	3.0	3.0

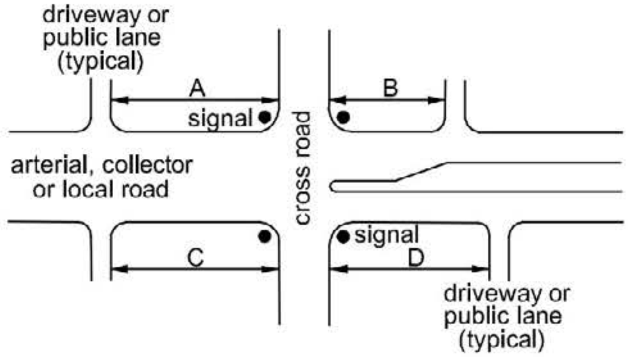
Notes:

a. Also established in consideration of location of first driveway on adjacebt property.
b. Driveways straddling the property line and common to both properties.
c. Greater distances for driveways adjacent to major intersections; refer to Section 8.8
d. Greater spacing required along arterial - refer to Section 8.5: Continuous Right-turn Auxiliary Lanes
e. Greater spacing often results from maximum number of driveways per property; see Table 8.9.2



Notes:
1. For suggested minimum corner clearance at major intersections, see Figure 8.8.2
2. Where turns are not permitted, R=1.5 m assists in discouraging wrong-way movements.
3. For typical R and W dimensions, refer to Table 8.9.1
4. Minimum angle of 70° desirable where pedestrians routinely cross driveway, 45° minimum otherwise.

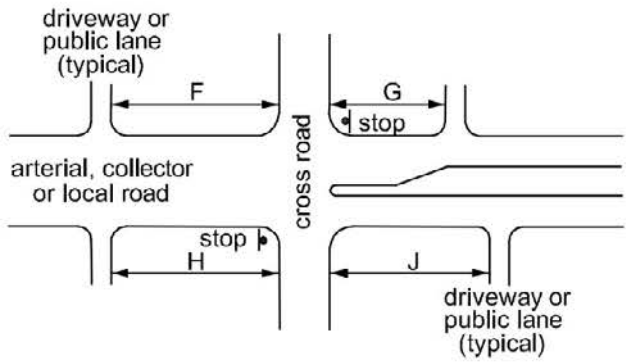
Figure 8.9.2: Driveway Spacing Guidelines – Locals and Collectors



item	min. clearance, m		
	arterial	collector [b]	local [d]
A	70 [c]	55	15
B	# [a]	25	15
C	70	55	15
D	70 [c]	55	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.
c. Reduced distances feasible if auxiliary lane implemented, see Section 8.5
d. Values based on operating speed of 50km/h, higher values desirable for higher speeds or may be warranted by traffic conditions.

signals at the cross road



item	min. clearance, m		
	arterial	collector [b]	local [b]
F	35	20	15
G	# [a]	25	15
H	25	25	15
J	35	20	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.

stop control at the cross road

Figure 8.8.2: Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections

Inadequate corner clearance between accesses and signalized intersections along a major road, such as a major arterial, can create serious operational problems including:

Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance.

$$SSD = 0.278Vt + 0.039 \frac{V^2}{a} \quad (2.5.2)$$

Where:

SSD = Stopping sight distance (m)
t = Brake reaction time, 2.5 s
V = Design speed (km/h)
a = Deceleration rate (m/s^2)

Table 2.5.2 gives the minimum stopping sight distances on level grade, on wet pavement, for a range of design speeds. These values are used for vertical curve design, intersection geometry and the placement of traffic control devices. The stopping sight distances quoted in **Table 2.5.2** may need to be increased for a variety of reasons related to grade and vehicle type as noted below.

Table 2.5.2: Stopping Sight Distance on level roadways for Automobiles[54]

Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Stopping sight distance	
			Calculated (m)	Design (m)
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65
60	41.7	41.3	83.0	85
70	48.7	56.2	104.9	105
80	55.6	73.4	129.0	130
90	62.6	92.9	155.5	160
100	69.5	114.7	184.2	185
110	76.5	138.8	215.3	220
120	83.4	165.2	248.6	250
130	90.4	193.8	284.2	285

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s^2 used to determine calculated sight distance.

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278\ V_{major}\, t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

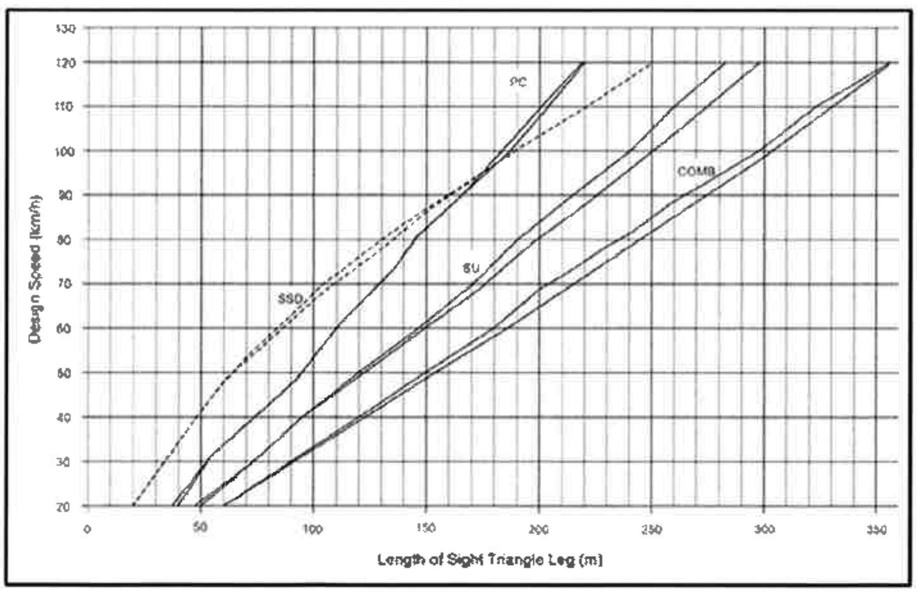


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)

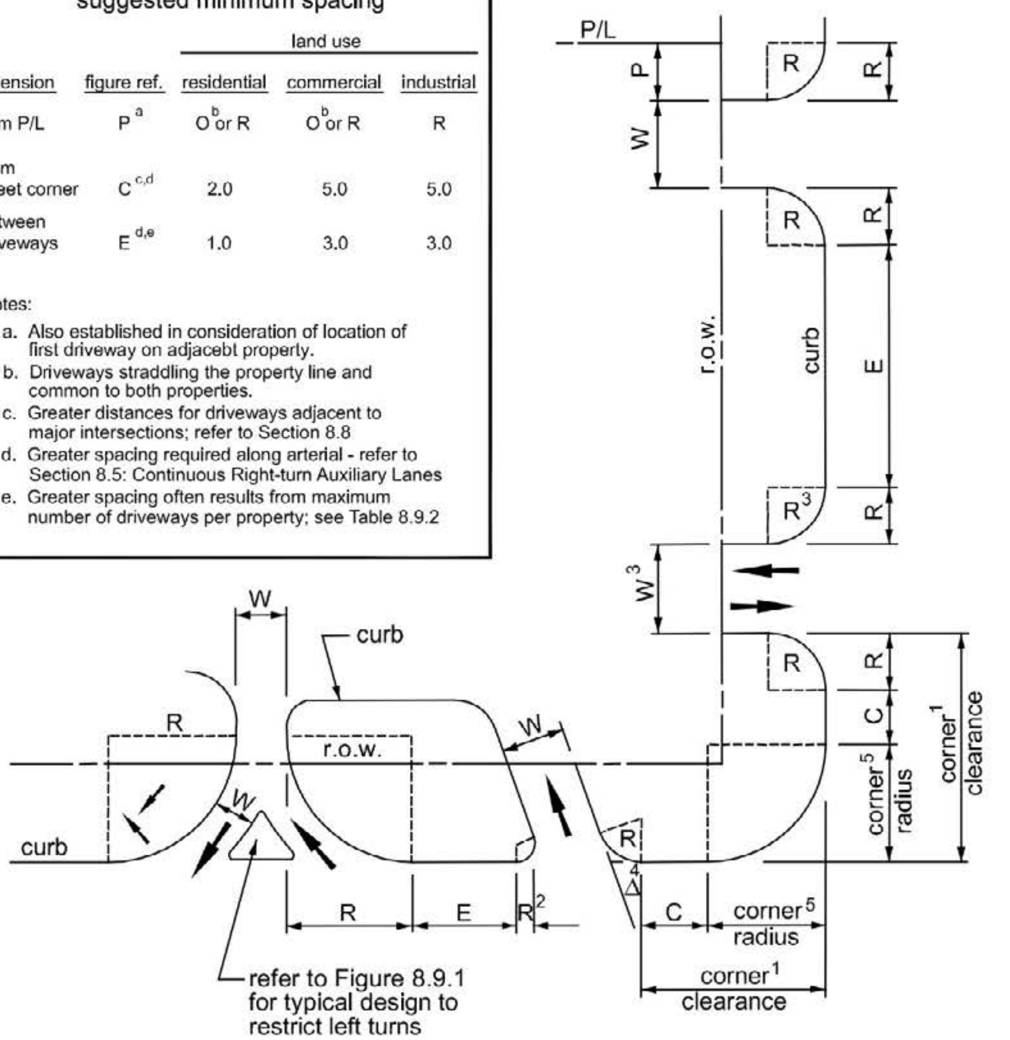
collector roadways, while a 3.0 m minimum is the suggested dimension for both commercial and industrial land uses. If there is a need to provide parallel parking between driveways along the roadway, a spacing of 6.0 to 7.5 m is suitable. If the spacing provided is in the range of 3.0 to 5.0 m, the space may appear inviting to a driver wishing to park, but if used, severely hampers the operation of the driveways by reducing sight lines and interfering with the turning paths of the vehicles.

suggested minimum spacing

		land use		
dimension	figure ref.	residential	commercial	industrial
from P/L	P [a]	O [b] or R	O [b] or R	R
from street corner	C [c,d]	2.0	5.0	5.0
between driveways	E [d,e]	1.0	3.0	3.0

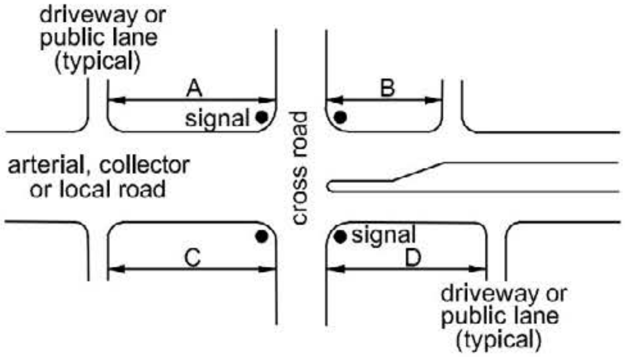
Notes:

a. Also established in consideration of location of first driveway on adjacebt property.
b. Driveways straddling the property line and common to both properties.
c. Greater distances for driveways adjacent to major intersections; refer to Section 8.8
d. Greater spacing required along arterial - refer to Section 8.5: Continuous Right-turn Auxiliary Lanes
e. Greater spacing often results from maximum number of driveways per property; see Table 8.9.2



Notes: 1. For suggested minimum corner clearance at major intersections, see Figure 8.8.2
2. Where turns are not permitted, R=1.5 m assists in discouraging wrong-way movements.
3. For typical R and W dimensions, refer to Table 8.9.1
4. Minimum angle of 70° desirable where pedestrians routinely cross driveway, 45° minimum otherwise.

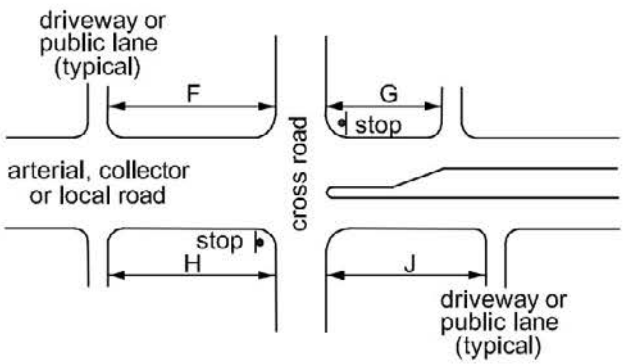
Figure 8.9.2: Driveway Spacing Guidelines – Locals and Collectors



item	min. clearance, m		
	arterial	collector[b]	local[d]
A	70[c]	55	15
B	#[a]	25	15
C	70	55	15
D	70[c]	55	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.
c. Reduced distances feasible if auxiliary lane implemented, see Section 8.5
d. Values based on operating speed of 50km/h, higher values desirable for higher speeds or may be warranted by traffic conditions.

signals at the cross road



item	min. clearance, m		
	arterial	collector[b]	local[b]
F	35	20	15
G	#[a]	25	15
H	25	25	15
J	35	20	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.

stop control at the cross road

Figure 8.8.2: Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections

Inadequate corner clearance between accesses and signalized intersections along a major road, such as a major arterial, can create serious operational problems including:

Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance.

$$SSD = 0.278Vt + 0.039 \frac{V^2}{a} \quad (2.5.2)$$

Where:

SSD = Stopping sight distance (m)
t = Brake reaction time, 2.5 s
V = Design speed (km/h)
a = Deceleration rate (m/s^2)

Table 2.5.2 gives the minimum stopping sight distances on level grade, on wet pavement, for a range of design speeds. These values are used for vertical curve design, intersection geometry and the placement of traffic control devices. The stopping sight distances quoted in **Table 2.5.2** may need to be increased for a variety of reasons related to grade and vehicle type as noted below.

Table 2.5.2: Stopping Sight Distance on level roadways for Automobiles[54]

Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Stopping sight distance	
			Calculated (m)	Design (m)
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65
60	41.7	41.3	83.0	85
70	48.7	56.2	104.9	105
80	55.6	73.4	129.0	130
90	62.6	92.9	155.5	160
100	69.5	114.7	184.2	185
110	76.5	138.8	215.3	220
120	83.4	165.2	248.6	250
130	90.4	193.8	284.2	285

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s^2 used to determine calculated sight distance.

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278\ V_{major}\ t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

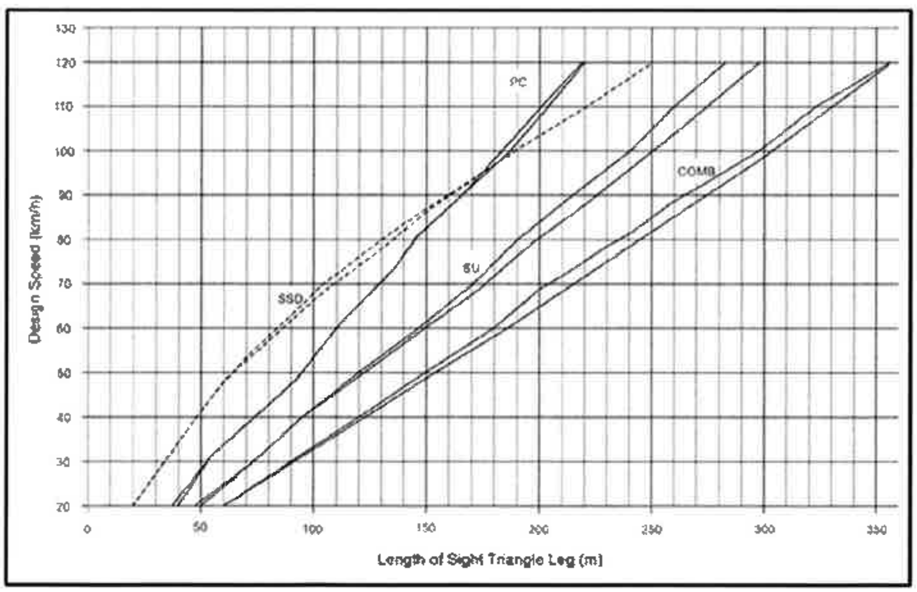
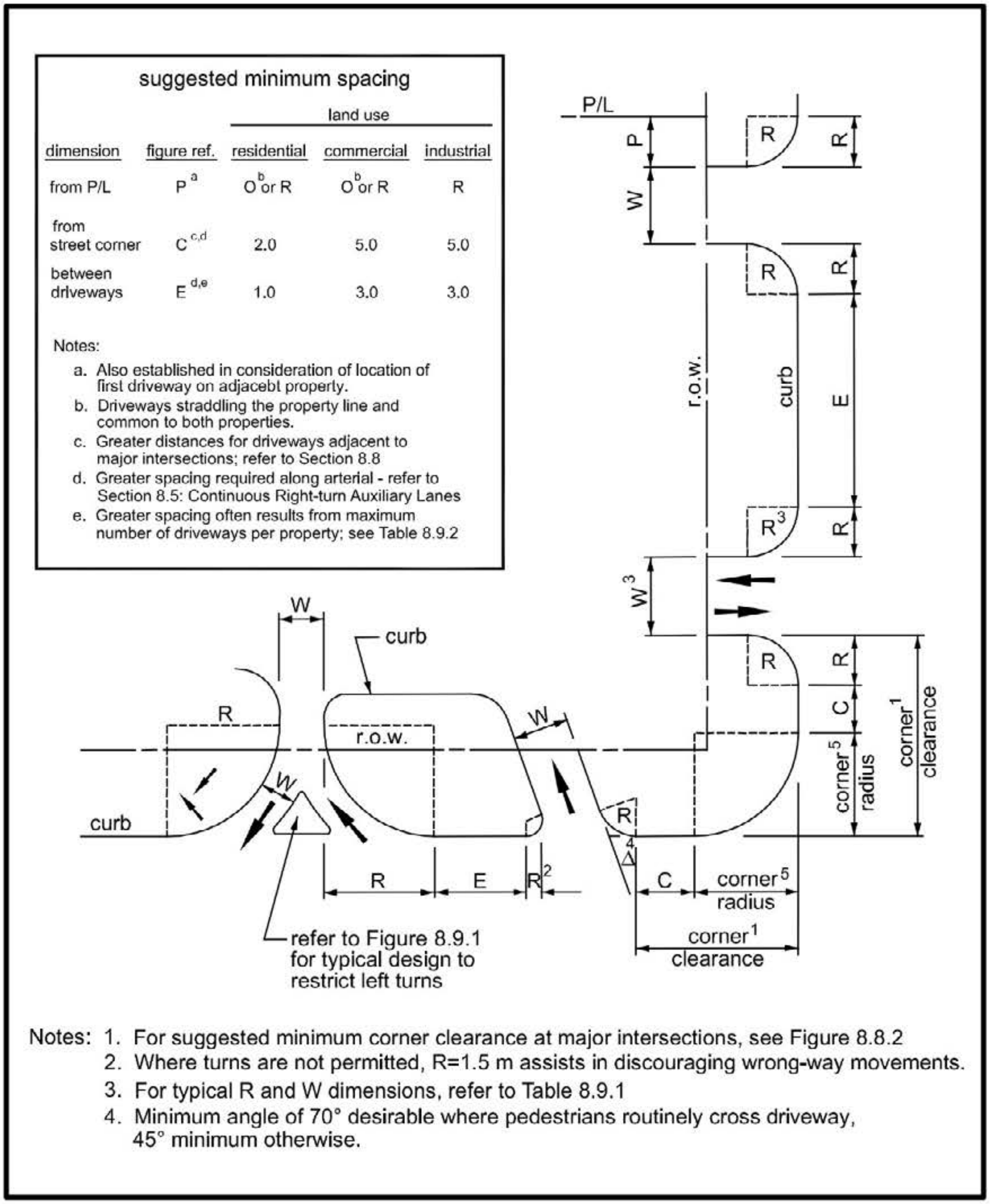


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)

collector roadways, while a 3.0 m minimum is the suggested dimension for both commercial and industrial land uses. If there is a need to provide parallel parking between driveways along the roadway, a spacing of 6.0 to 7.5 m is suitable. If the spacing provided is in the range of 3.0 to 5.0 m, the space may appear inviting to a driver wishing to park, but if used, severely hampers the operation of the driveways by reducing sight lines and interfering with the turning paths of the vehicles.



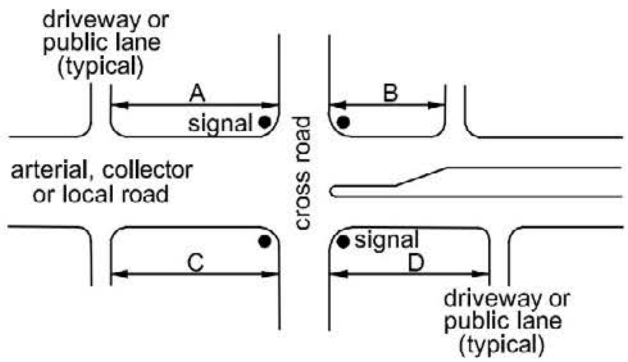
suggested minimum spacing

dimension	figure ref.	land use: residential	commercial	industrial
from P/L	P[a]	O[b] or R	O[b] or R	R
from street corner	C[c,d]	2.0	5.0	5.0
between driveways	E[d,e]	1.0	3.0	3.0

Notes:
a. Also established in consideration of location of first driveway on adjacebt property.
b. Driveways straddling the property line and common to both properties.
c. Greater distances for driveways adjacent to major intersections; refer to Section 8.8
d. Greater spacing required along arterial - refer to Section 8.5: Continuous Right-turn Auxiliary Lanes
e. Greater spacing often results from maximum number of driveways per property; see Table 8.9.2

Notes:
1. For suggested minimum corner clearance at major intersections, see Figure 8.8.2
2. Where turns are not permitted, R=1.5 m assists in discouraging wrong-way movements.
3. For typical R and W dimensions, refer to Table 8.9.1
4. Minimum angle of 70° desirable where pedestrians routinely cross driveway, 45° minimum otherwise.

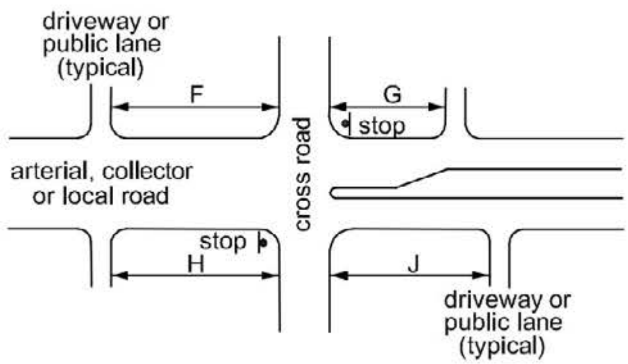
Figure 8.9.2: Driveway Spacing Guidelines – Locals and Collectors



item	min. clearance, m arterial	collector [b]	local [d]
A	70 [c]	55	15
B	# [a]	25	15
C	70	55	15
D	70 [c]	55	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.
c. Reduced distances feasible if auxiliary lane implemented, see Section 8.5
d. Values based on operating speed of 50km/h, higher values desirable for higher speeds or may be warranted by traffic conditions.

signals at the cross road



item	min. clearance, m arterial	collector [b]	local [b]
F	35	20	15
G	# [a]	25	15
H	25	25	15
J	35	20	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.

stop control at the cross road

Figure 8.8.2: Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections

Inadequate corner clearance between accesses and signalized intersections along a major road, such as a major arterial, can create serious operational problems including:

Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance.

$$SSD = 0.278Vt + 0.039\,\frac{V^2}{a} \qquad (2.5.2)$$

Where:

SSD = Stopping sight distance (m)
t = Brake reaction time, 2.5 s
V = Design speed (km/h)
a = Deceleration rate (m/s^2)

Table 2.5.2 gives the minimum stopping sight distances on level grade, on wet pavement, for a range of design speeds. These values are used for vertical curve design, intersection geometry and the placement of traffic control devices. The stopping sight distances quoted in **Table 2.5.2** may need to be increased for a variety of reasons related to grade and vehicle type as noted below.

Table 2.5.2: Stopping Sight Distance on level roadways for Automobiles[54]

Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Stopping sight distance	
			Calculated (m)	Design (m)
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65
60	41.7	41.3	83.0	85
70	48.7	56.2	104.9	105
80	55.6	73.4	129.0	130
90	62.6	92.9	155.5	160
100	69.5	114.7	184.2	185
110	76.5	138.8	215.3	220
120	83.4	165.2	248.6	250
130	90.4	193.8	284.2	285

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s^2 used to determine calculated sight distance.

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278\, V_{major}\, t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_g)(*s*) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

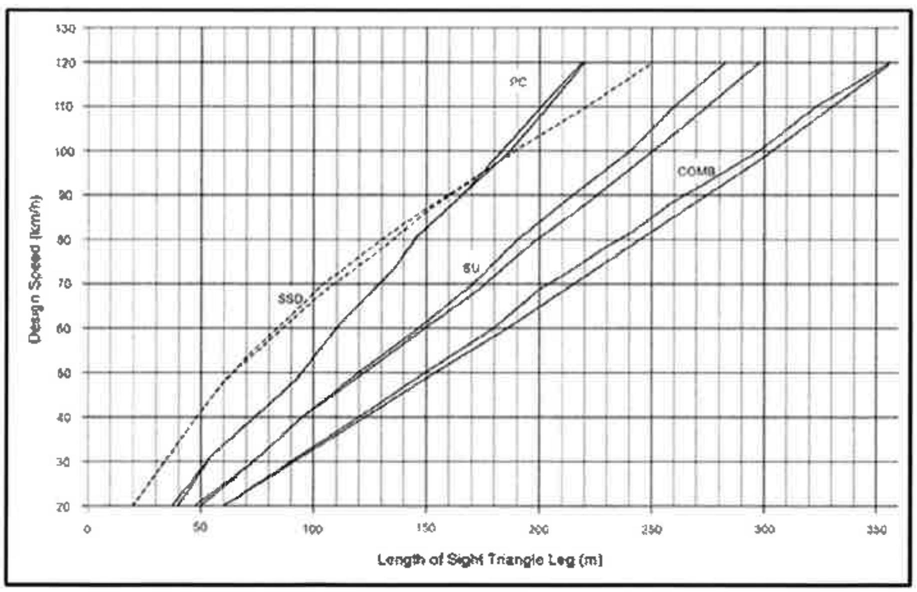


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)

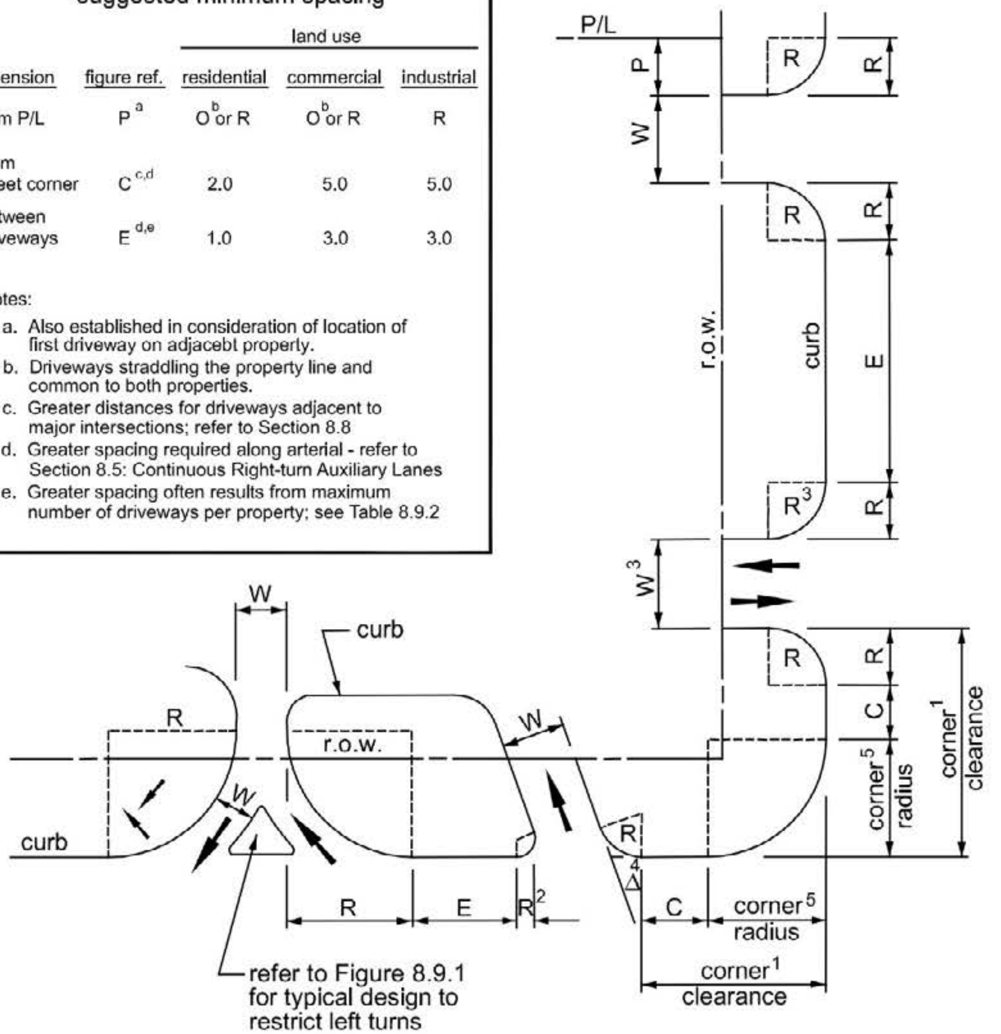
collector roadways, while a 3.0 m minimum is the suggested dimension for both commercial and industrial land uses. If there is a need to provide parallel parking between driveways along the roadway, a spacing of 6.0 to 7.5 m is suitable. If the spacing provided is in the range of 3.0 to 5.0 m, the space may appear inviting to a driver wishing to park, but if used, severely hampers the operation of the driveways by reducing sight lines and interfering with the turning paths of the vehicles.

suggested minimum spacing

dimension	figure ref.	land use: residential	land use: commercial	land use: industrial
from P/L	P [a]	O [b] or R	O [b] or R	R
from street corner	C [c,d]	2.0	5.0	5.0
between driveways	E [d,e]	1.0	3.0	3.0

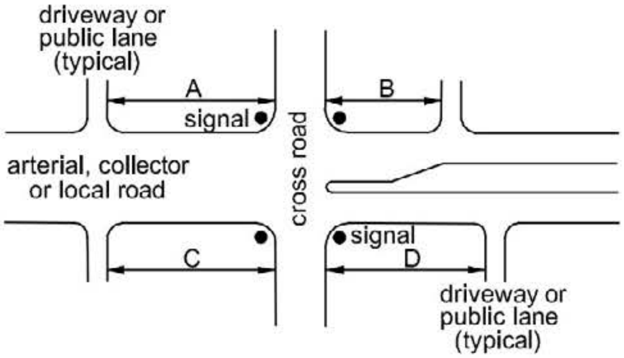
Notes:

a. Also established in consideration of location of first driveway on adjacebt property.
b. Driveways straddling the property line and common to both properties.
c. Greater distances for driveways adjacent to major intersections; refer to Section 8.8
d. Greater spacing required along arterial - refer to Section 8.5: Continuous Right-turn Auxiliary Lanes
e. Greater spacing often results from maximum number of driveways per property; see Table 8.9.2



Notes: 1. For suggested minimum corner clearance at major intersections, see Figure 8.8.2
2. Where turns are not permitted, R=1.5 m assists in discouraging wrong-way movements.
3. For typical R and W dimensions, refer to Table 8.9.1
4. Minimum angle of 70° desirable where pedestrians routinely cross driveway, 45° minimum otherwise.

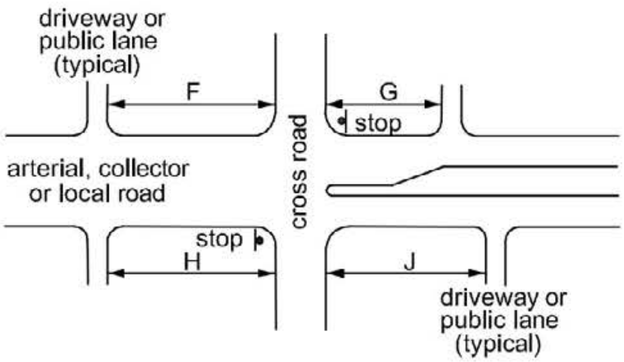
Figure 8.9.2: Driveway Spacing Guidelines – Locals and Collectors



item	min. clearance, m		
	arterial	collector [b]	local [d]
A	70 [c]	55	15
B	# [a]	25	15
C	70	55	15
D	70 [c]	55	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.
c. Reduced distances feasible if auxiliary lane implemented, see Section 8.5
d. Values based on operating speed of 50km/h, higher values desirable for higher speeds or may be warranted by traffic conditions.

signals at the cross road



item	min. clearance, m		
	arterial	collector [b]	local [b]
F	35	20	15
G	# [a]	25	15
H	25	25	15
J	35	20	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.

stop control at the cross road

Figure 8.8.2: Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections

Inadequate corner clearance between accesses and signalized intersections along a major road, such as a major arterial, can create serious operational problems including:

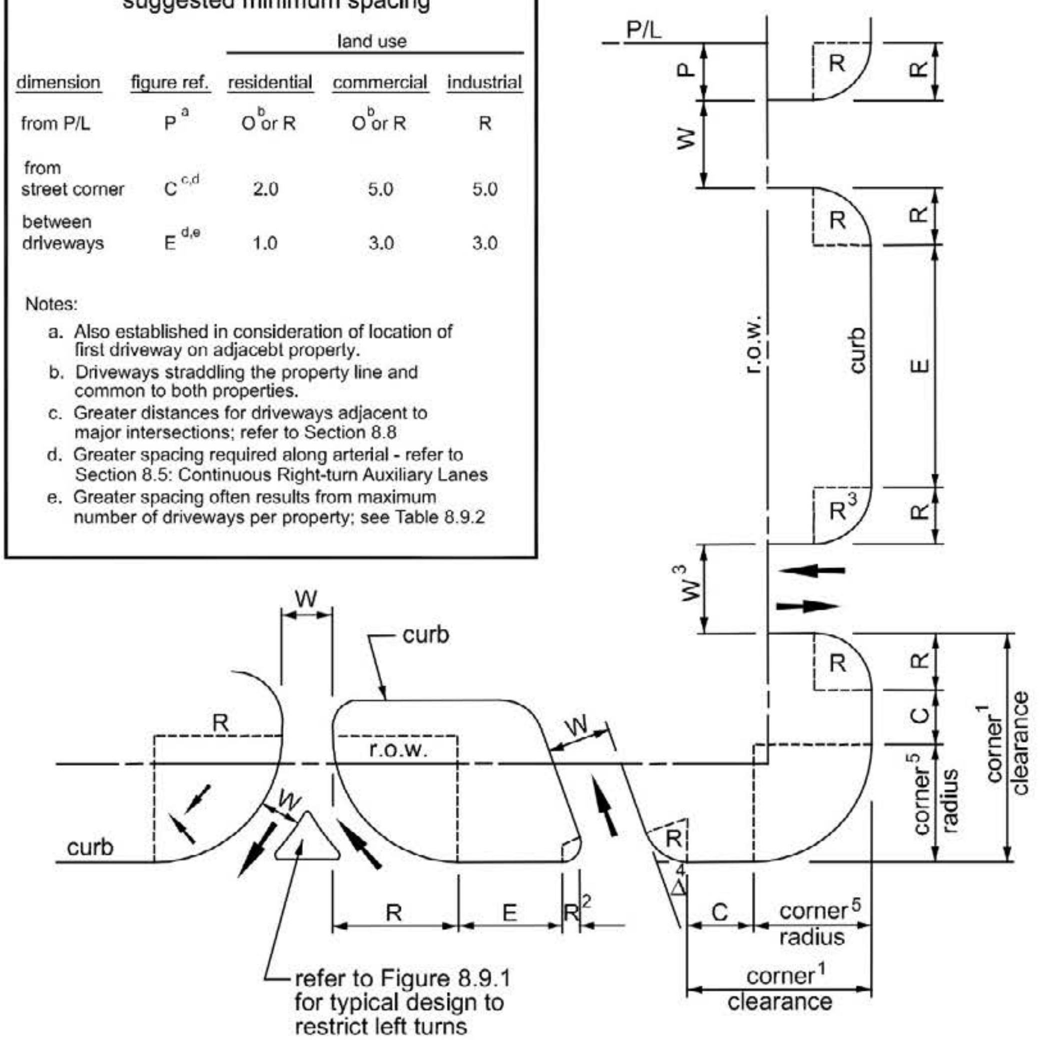
collector roadways, while a 3.0 m minimum is the suggested dimension for both commercial and industrial land uses. If there is a need to provide parallel parking between driveways along the roadway, a spacing of 6.0 to 7.5 m is suitable. If the spacing provided is in the range of 3.0 to 5.0 m, the space may appear inviting to a driver wishing to park, but if used, severely hampers the operation of the driveways by reducing sight lines and interfering with the turning paths of the vehicles.

suggested minimum spacing

dimension	figure ref.	land use: residential	land use: commercial	land use: industrial
from P/L	P[a]	O[b] or R	O[b] or R	R
from street corner	C[c,d]	2.0	5.0	5.0
between driveways	E[d,e]	1.0	3.0	3.0

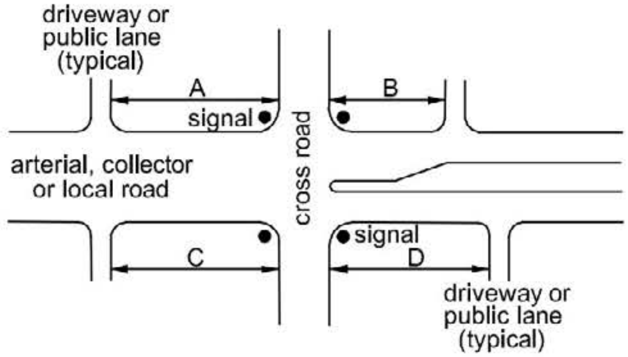
Notes:

a. Also established in consideration of location of first driveway on adjacebt property.
b. Driveways straddling the property line and common to both properties.
c. Greater distances for driveways adjacent to major intersections; refer to Section 8.8
d. Greater spacing required along arterial - refer to Section 8.5: Continuous Right-turn Auxiliary Lanes
e. Greater spacing often results from maximum number of driveways per property; see Table 8.9.2



Notes:
1. For suggested minimum corner clearance at major intersections, see Figure 8.8.2
2. Where turns are not permitted, R=1.5 m assists in discouraging wrong-way movements.
3. For typical R and W dimensions, refer to Table 8.9.1
4. Minimum angle of 70° desirable where pedestrians routinely cross driveway, 45° minimum otherwise.

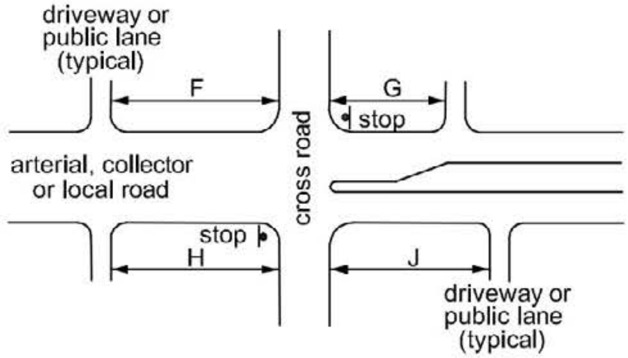
Figure 8.9.2: Driveway Spacing Guidelines – Locals and Collectors



item	min. clearance, m		
	arterial	collector[b]	local[d]
A	70[c]	55	15
B	#[a]	25	15
C	70	55	15
D	70[c]	55	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.
c. Reduced distances feasible if auxiliary lane implemented, see Section 8.5
d. Values based on operating speed of 50km/h, higher values desirable for higher speeds or may be warranted by traffic conditions.

signals at the cross road



item	min. clearance, m		
	arterial	collector[b]	local[b]
F	35	20	15
G	#[a]	25	15
H	25	25	15
J	35	20	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.

stop control at the cross road

Figure 8.8.2: Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections

Inadequate corner clearance between accesses and signalized intersections along a major road, such as a major arterial, can create serious operational problems including:

Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance.

$$SSD = 0.278Vt + 0.039\frac{V^2}{a} \qquad (2.5.2)$$

Where:

SSD = Stopping sight distance (m)
t = Brake reaction time, 2.5 s
V = Design speed (km/h)
a = Deceleration rate (m/s^2)

Table 2.5.2 gives the minimum stopping sight distances on level grade, on wet pavement, for a range of design speeds. These values are used for vertical curve design, intersection geometry and the placement of traffic control devices. The stopping sight distances quoted in **Table 2.5.2** may need to be increased for a variety of reasons related to grade and vehicle type as noted below.

Table 2.5.2: Stopping Sight Distance on level roadways for Automobiles[54]

Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Stopping sight distance	
			Calculated (m)	Design (m)
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65
60	41.7	41.3	83.0	85
70	48.7	56.2	104.9	105
80	55.6	73.4	129.0	130
90	62.6	92.9	155.5	160
100	69.5	114.7	184.2	185
110	76.5	138.8	215.3	220
120	83.4	165.2	248.6	250
130	90.4	193.8	284.2	285

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s^2 used to determine calculated sight distance.

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278\ V_{major}\ t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_g)(*s*) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

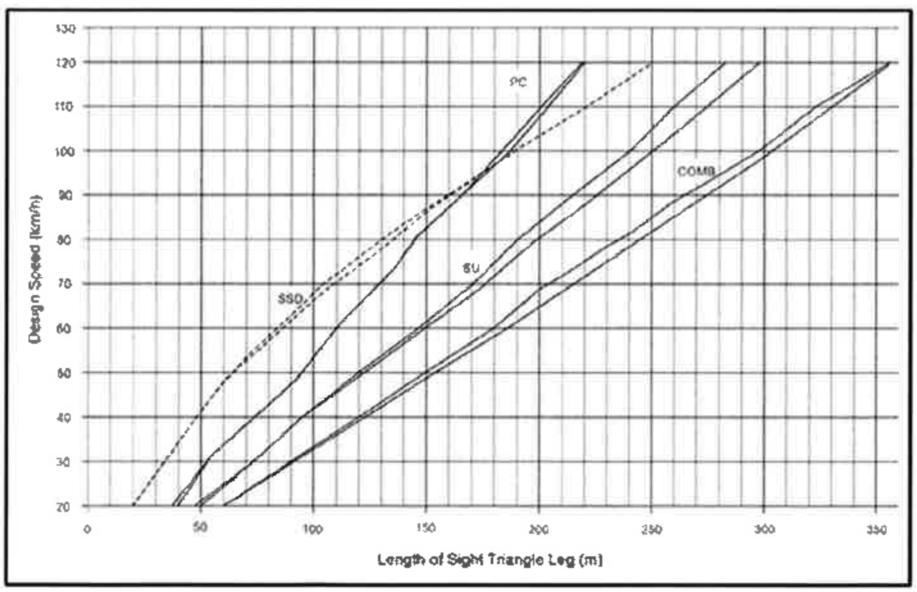


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)

APPENDIX P:

City of Mississauga Zoning By-Law Excerpts

MISSISSAUGA

3.1.2.1 Required Number of Parking Spaces for Residential Uses

3.1.2.2 Required Number of Parking Spaces for Non-Residential Uses

Off-street **parking spaces** for non-residential **uses** shall be provided in accordance with Table 3.1.2.2. - Required Number of Off-Street Parking Spaces for Non-Residential Uses. (0117-2022)

Table 3.1.2.2 - Required Number of Parking Spaces for Non-Residential Uses

(0358-2007), (0207-2008), (0325-2008), (0379-2009), (0308-2011), (0190-2014), (0050-2013/LPAT Order 2020 June 08), (0018-2015), (0055-2015), (0212-2015), (0111-2019/LPAT Order 2021 March 09), (0018-2021), (0117-2022), (0100-2023), Unconsolidated By-law 0203-2023

Column	A	B	C	D	E	F
Line 1.0	**TYPE OF USE**	**UNIT OF MEASUREMENT**	**PRECINCT 1**	**PRECINCT 2**	**PRECINCT 3**	**PRECINCT 4**
2.0	**Active Recreational Use**	spaces per 100 m^2 **GFA - non-residential** , except for an arena or a **marina**	4.5	4.5	4.5	4.5
3.0	**Adult Entertainment Establishment**	spaces per 100 m^2 **GFA - non-residential**	16.3	16.3	16.3	16.3
4.0	Animal Services:					
4.1	**Animal Boarding Establishment**	spaces per 100 m^2 **G** FA - non-residential	3.0	3.0	3.6	3.6
4.2	**Animal Care Establishment**	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	4.0	5.0>
5.0	Arena	space per four seats of permanent fixed seating (1)	1.0	1.0	1.0	1.0
6.0	Art Gallery, Museum	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	3.6	3.6
7.0	**Banquet Hall/ Conference Centre/ Convention Centre**	spaces per 100 m^2 **GFA - non-residential**	10.8	10.8	10.8	10.8
8.0	**Commercial School**	spaces per 100 m^2 **GFA - non-residential**	5.0	5.0	5.0	5.0
9.0	**Community Centre**	spaces per 100 m^2 **GFA - non-residential** , except for an arena	4.5	4.5	4.5	4.5

10.0	**Composting Facility**	spaces per 100 m^2 **GFA - non-residential** up to 2 325 m^2 **GFA - non-residential** ;	1.6	1.6	1.6	1.6
		and				
		spaces per 100 m^2 **GFA - non-residential** between 2 325 m^2 and 9 300 m^2 **GFA - non-residential** ;	1.1	1.1	1.1	1.1
		and				
		spaces per 100 m^2 **GFA - non-residential** over 9 300 m^2 **GFA - non-residential** .	0.6	0.6	0.6	0.6
11.0	Contractor Service Shop	spaces per 100 m^2 **GFA - non-residential**	1.1	1.1	1.1	1.1
12.0	Contractor's Yard	spaces per 100 m^2 **GFA - non-residential**	0.6	0.6	0.6	0.6
13.0	**Convenience Retail** and **Service Kiosk**	spaces per 100 m^2 **GFA - non-residential** plus a **stacking lane** where a drive-through is provided (2)	3.0	3.0	4.0	5.0
14.0	**Day Care**	spaces per 100 m^2 **GFA - non-residential**	2.5	2.5	2.5	2.5
15.0	**Education and Training Facility**	spaces per 100 m^2 **GFA - non-residential**	5.0	5.0	5.0	5.0
16.0	**Entertainment Establishment**	space per five seats of permanent fixed seating (1);	1.0	1.0	1.0	1.0
		or				
		spaces per 100 m^2 **GFA - non-residential** , whichever is greater.	10.0	10.0	10.0	10.0
17.0	**Essential Emergency Service**	space per staff on duty with a minimum of 2.0 spaces	1.0	1.0	1.0	1.0
18.0	**Financial Institution**	spaces per 100 m^2 **GFA - non-residential** plus a **stacking lane** where a drive-through is provided (2)	3.0	3.0	4.0	5.0
19.0	**Food Bank**	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	3.0	3.0

20.0	**Funeral Establishment**	spaces per 100 m^2 **GFA - non-residential** for the area accessible to the public	7.5	7.5	7.5	7.5
21.0	**Garden Centre**	spaces per 100 m^2 **GFA - non-residential** used for retail sales and display of products and/or **office** ;	2.0	2.5	2.8	3.0
		and				
		spaces per 100 m^2 **GFA - non-residential** used for warehousing and/or wholesaling.	1.1	1.1	1.1	1.1
22.0	**Golf Course**	spaces per hole	10.0	10.0	10.0	10.0
23.0	**Hospital**	spaces per 100 m^2 **GFA - non-residential**	2.5	2.5	2.5	2.5
24.0	**Library**	spaces per 100 m^2 **GFA - non-residential**	3.2	3.2	3.2	3.2
25.0	**Manufacturing Facility** (Single-Occupancy **Building**) (6)	spaces per 100 m^2 **GFA - non-residential** up to 2 325 m^2 **GFA - non-residential** ;	1.6	1.6	1.6	1.6
		and				
		spaces per 100 m^2 **GFA - non-residential** between 2 325 m^2 and 9 300 m^2 **GFA - non-residential** ;	1.1	1.1	1.1	1.1
		and				
		spaces per 100 m^2 **GFA - non-residential** over 9 300 m^2 **GFA - non-residential** .	0.6	0.6	0.6	0.6

26.0	**Manufacturing Facility** (Multiple-Occupancy Mixed Use **Building**) (4)	spaces per 100 m^2 **GFA - non-residential**	1.6	1.6	1.6	1.6
			Parking for **restaurant** , **convenience restaurant** , **banquet hall/conference centre/convention centre** , **night club** , and **adult entertainment establishment** will be provided in accordance with the applicable regulations contained in Table 3.1.2.2 of this By-law. Parking for individual manufacturing occupancies which exceed a **GFA - non-residential** of 2 325 m^2 shall be calculated in accordance with the provisions applicable to **manufacturing facility** (Single-Occupancy **Building**). Parking for individual warehouse/ distribution occupancies, and wholesaling occupancies which exceed a **GFA - non-residential** of 6 975 m^2 shall be calculated in accordance with the regulations applicable to warehouse/ distribution facilities, **wholesaling facilities** (Single-Occupancy **Building**).			
27.0	**Marina**	spaces per slip or berth	0.6	0.6	0.6	0.6
28.0	**Medicinal Product Manufacturing Facility** **Medicinal Product Manufacturing Facility - Restricted** **Plant-Based Manufacturing Facility**	spaces per 100 m^2 **GFA - non-residential** up to 2 325 m^2 **GFA - non-residential** ;	1.6	1.6	1.6	1.6
		and				
		spaces per 100 m^2 **GFA - non-residential** between 2 325 m^2 and 9 300 m^2 **GFA - non-residential** ;	1.1	1.1	1.1	1.1
		and				
		spaces per 100 m^2 **GFA - non-residential** over 9 300 m^2 **GFA - non residential** .	0.6	0.6	0.6	0.6
29.0	**Motor Vehicle Body Repair Facility** , **Motor Vehicle Repair Facility - Commercial Motor Vehicle, Motor Vehicle Repair Facility - Restricted**	spaces per 100 m^2 **GFA - non-residential** , of which 50% of the required spaces may be **tandem parking spaces**	4.3	4.3	4.3	4.3

30.0	**Motor Vehicle Sales, Leasing and/or Rental Facility - Commercial Motor Vehicles** ; **Motor Vehicle Sales , Leasing and/or Rental Facility - Restricted**	spaces per 100 m^2 **GFA - non-residential** (exclusive of display and storage parking)	4.3	4.3	4.3	4.3
31.0	**Motor Vehicle Service Station**	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	4.0	5.0
32.0	**Motor Vehicle Wash Facility - Commercial Motor Vehicle, Motor Vehicle Wash Facility - Restricted**	spaces per wash bay, of which 2.0 spaces can be located at vacuum stations, plus a stacking lane (2)	4.0	4.0	4.0	4.0
33.0	**Night Club** :					
33.1	**Night Club**	spaces per 100 m^2 **GFA - non-residential**	25.2	25.2	25.2	25.2
33.2	**Night Club** (in CC1, CC2, CCO zones)	spaces per 100 m^2 **GFA - non-residential**	9.0			
34.0	**Office** :					
34.1	**Office** (6)	spaces per 100 m^2 **GFA - non-residential**	2.0	2.5	2.8	3.0
		Where the non- **office uses** , including **medical office** , in an office building , are greater than 10% of the total **GFA - non-residential** of the office building , separate parking will be required for all of such **uses** in accordance with the regulations contained in Table 3.1.2.2 of this By-law.				
34.2	**Medical Office** , **Medical Office - Restricted**	spaces per 100 m^2 **GFA - non-residential**	3.8	4.0	4.5	5.5

35.0	**Overnight Accommodation**	space per guest room;	0.8	0.8	0.8	0.8
		plus				
		spaces per 100 m^2 **GFA - non-residential** used for public **use** areas including meeting rooms, conference rooms, recreational facilities, dining and lounge areas and other commercial facilities, but excluding bedrooms, kitchens, laundry rooms, washrooms, lobbies, hallways, elevators, stairways and recreational facilities directly related to the function of the **overnight accommodation** .	10.0	10.0	10.0	10.0
36.0	**Pilot Plant, Prototype Production Facility**	spaces per 100 m^2 **GFA - non-residential** up to 2 325 m^2 **GFA - non-residential** ;	1.6	1.6	1.6	1.6
		and				
		spaces per 100 m^2 **GFA - non-residential** between 2 325 m^2 and 9 300 m^2 **GFA - non-residential** ;	1.1	1.1	1.1	1.1
		and				
		spaces per 100 m^2 **GFA - non-residential** over 9 300 m^2 **GFA - non-residential** .	0.6	0.6	0.6	0.6

37.0	**Place of Religious Assembly**	space per 4.5 seats for permanent fixed seating (1);	1.0	1.0	1.0	1.0
		plus				
		spaces for any non-fixed moveable seating per 100 m^2 **GFA - non-residential**, all in the **worship area**;	27.1	27.1	27.1	27.1
		or				
		spaces for all non-fixed moveable seating per 100 m^2 **GFA - non-residential**, in the **worship area**;	27.1	27.1	27.1	27.1
		or				
		spaces per 100 m^2 **GFA - non-residential**, whichever is greater.	10.0	10.0	10.0	10.0
		Where the **worship area** of a **place of religious assembly** includes permanent fixed seating or non-fixed moveable seating for clergy, leaders, choirs, or musicians, such seating or area shall be included in the calculation of seating for the purpose of calculating required parking. Where a community/multi-use hall is equal to or less than the **gross floor area** of the **worship area**, no additional parking shall be required for that **use**.				
38.0	**Power Generating Facility**	space per staff on duty with a minimum of 2.0 spaces	1.0	1.0	1.0	1.0
39.0	**Private Club**	spaces per 100 m^2 **GFA - non-residential**	4.5	4.5	4.5	4.5
40.0	**Recreational Establishment**	spaces per 100 m^2 **GFA - non-residential**, except for an arena	4.5	4.5	4.5	4.5
41.0	**Repair Establishment**	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	4.0	5.0
42.0	Retail Centre:					
42.1	Retail Centre (Less than or equal to 2 000 m^2 **GFA - non-residential**)	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	3.5	4.3
		Parking for **restaurant** and **convenience restaurant** over 220 m^2 **GFA - non-residential**, **place of religious assembly**, **funeral establishment**, **overnight accommodation**, **banquet hall/ conference centre/convention centre** and **entertainment establishment uses** will be provided in accordance with the applicable regulations contained in Table 3.1.2.2 of this By-law.				

42.2	Retail Centre (Greater than 2 000 m^2 **GFA - non-residential**)	spaces per 100 m^2 **GFA - non-residential**	3.8	3.8	4.5	5.4
43.0	**Retail Store**	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	4.0	5.0
44.0	**Restaurants** :					
44.1	**Convenience Restaurant**	spaces per 100 m^2 **GFA - non-residential**				
		Less than or equal to 220 m^2 **GFA - non-residential**	3.0	3.0	4.0	5.0
		Over 220 m^2 **GFA - non-residential** plus a **stacking lane** (2)	6.0	6.0	9.0	9.0
44.2	**Restaurant**	spaces per 100 m^2 **GFA - non-residential**				
		Less than or equal to 220 m^2 **GFA - non-residential**	3.0	3.0	4.0	5.0
		Over 220 m^2 **GFA - non-residential**	6.0	6.0	9.0	9.0
44.3	**Take-out Restaurant**	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	4.0	5.0
45.0	Schools:					
45.1	College, University	spaces per 100 m^2 **GFA - non-residential** used for academic purposes;	1.1	1.1	1.1	1.1
		plus				
		spaces per resident student and/or staff.	0.15	0.15	0.15	0.15
45.2	**Public/Private School** (up to and including Grade 8)	space per 100 m^2 **GFA - non-residential** (excluding portables)	1.0	1.0	1.0	1.0
		plus				
		spaces per portable classroom (3)	1.0	1.0	1.0	1.0
45.3	**Public/Private School** (Grade 9 and above)	spaces per 100 m^2 **GFA - non-residential** (excluding portables)	1.5	1.5	1.5	1.5
		plus				
		spaces per portable classroom (3)	1.0	1.0	1.0	1.0

46.0	**Science and Technology Facility**	spaces per 100 m^2 **GFA - non-residential**	2.0	2.5	2.8	3.0
47.0	Self Storage Facility	spaces per 100 m^2 **GFA - non-residential** (exclusive of storage parking)	0.25	0.25	0.25	0.25
48.0	**Service Establishment**	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	4.0	5.0
49.0	**Transit Terminal**	space per staff on duty with a minimum of 2.0 spaces	1.0	1.0	1.0	1.0
50.0	**Truck Terminal**	spaces per 100 m^2 **GFA - non-residential** used for **office** purposes;	2.0	2.5	2.8	3.0
		and/or				
		spaces per 100 m^2 **GFA - non-residential** used for **warehouse/distribution facility**	1.1	1.1	1.1	1.1
51.0	Utility:					
51.1	**Utility Building**	space per staff on duty with a minimum of 2.0 spaces	1.0	1.0	1.0	1.0
51.2	**Water Treatment Facility**	space per staff on duty with a minimum of 2.0 spaces	1.0	1.0	1.0	1.0
51.3	**Sewage Treatment Plant**	space per staff on duty with a minimum of 2.0 spaces	1.0	1.0	1.0	1.0
51.4	**Electric Transformer and Distribution Facility**	space per staff on duty with a minimum of 2.0 spaces	1.0	1.0	1.0	1.0
52.0	**Vehicle Pound Facility**	spaces per 100 m^2 **GFA - non-residential** used for **office** , with a minimum of 4.0 spaces	2.0	2.5	2.8	3.0
53.0	**Veterinary Clinic**	spaces per 100 m^2 **GFA - non-residential**	3.0	3.0	3.6	3.6

54.0	**Warehouse/ Distribution Facility** , **Wholesaling Facility** (Single-Occupancy **Building**) (6)	spaces per 100 m^2 **GFA - non-residential** up to 6 975 m^2 **GFA - non-residential** ;	1.1	1.1	1.1	1.1
		and				
		spaces per 100 m^2 **GFA - non-residential** over 6 975 m^2 **GFA - non-residential** .	0.6	0.6	0.6	0.6
55.0	**Warehouse/ Distribution Facility** , **Wholesaling Facility** (Multiple-Occupancy **Building**) (5)	spaces per 100 m^2 **GFA - non-residential**	1.1	1.1	1.1	1.1
		Parking for individual warehouse/distribution occupancies and wholesaling occupancies which exceed a **GFA - non-residential** of 6 975 m^2 shall be calculated in accordance with the regulations applicable to warehouse/ distributi , **wholesaling facilities** (Single-Occupancy **Building**).				
56.0	**Waste Processing Station**	spaces per 100 m^2 **GFA - non-residential** up to 2 325 m^2 **GFA - non-residential** ;	1.6	1.6	1.6	1.6
		and				
		spaces per 100 m^2 **GFA - non-residential** between 2 325 m^2 and 9 300 m^2 **GFA - non-residential** ;	1.1	1.1	1.1	1.1
		and				
		spaces per 100 m^2 **GFA - non-residential** over 9 300 m^2 **GFA - non-residential** .	0.6	0.6	0.6	0.6
57.0	**Waste Transfer Station**	spaces per 100 m^2 **GFA - non-residential** up to 6 975 m^2 **GFA - non-residential** ;	1.1	1.1	1.1	1.1
		and				
		spaces per 100 m^2 **GFA - non-residential** over 6 975 m^2 **GFA - non-residential** .	0.6	0.6	0.6	0.6
58.0	Other Non-Residential **Uses** Not Specified Above	spaces per 100 m^2 **GFA - non-residential**	5.4	5.4	5.4	5.4

NOTES: (1) See Sentence 3.1.2.2.1 of this By-law.

(2) See also Subsection 3.1.5 of this By-law.

(3) See also Article 3.1.1.11 of this By-law.
(4) See Sentence 3.1.2.2.2 of this By-law.
(5) See Sentence 3.1.2.2.3 of this By-law.
(6) See Sentence 3.1.2.2.4 of this By-law.

3.1.3.1 Required Number of Accessible Parking Spaces

3.1.4.3 Required Number of Loading Spaces
Where required, **loading spaces** for **uses** other than **office** and/or **medical office** **uses**, shall be provided in accordance with Table 3.1.4.3 - Required Number of Loading Spaces.
Table 3.1.4.3 - Required Number of Loading Spaces
(0297-2013)

ColumnA		**B**
Line 1.0	**GROSS FLOOR AREA - NON-RESIDENTIAL OF BUILDING**	**MINIMUM NUMBER OF OFF-STREET LOADING SPACES**
2.0	Less than or equal to 250 m²	None required
3.0	Greater than 250 m² but less than or equal to 2 350 m²	1.0 space
4.0	Greater than 2 350 m² but less than or equal to 7 500 m²	2.0 spaces
5.0	Greater than 7 500 m² but less than or equal to 14 000 m²	3.0 spaces
6.0	Greater than 14 000 m²	3.0 spaces plus 1.0 additional space for each 9 300 m² **GFA - non-residential** or portion thereof

3.1.4.4 Loading Space Dimensions
Required **loading spaces** shall have an unobstructed rectangular area with a minimum width of 3.5 m and a minimum length of 9.0 m.

3.1.4.5 Required Number of Loading Spaces for Apartment and/or Retirement Buildings
One **loading space** per **apartment** and/or **retirement building** containing a minimum of 30 **dwelling units**, shall be required. (0174-2017)

3.1.3.1 A
Accessible parking spaces for non-residential **uses** shall be provided in compliance with Table 3.1.3.1 - Accessible Parking Regulations. (0144-2016)

3.1.3.1 B
Accessible parking spaces for residential **uses** shall only apply to the total number of visitor **parking spaces** required and shall be provided in compliance with Table 3.1.3.1 - Accessible Parking Regulations. (0144-2016)
Table 3.1.3.1 - Accessible Parking Regulations
(0190-2014), (0144-2016), (0018-2021)

ColumnA	**B**	**C**

Line 1.0	TOTAL NUMBER OF REQUIRED NON-RESIDENTIAL PARKING SPACES	TOTAL NUMBER OF REQUIRED VISITOR PARKING SPACES	MINIMUM NUMBER OF REQUIRED ACCESSIBLE PARKING SPACES
2.0	1-12	1-12	1.0 space (1)
3.0	13-100	13-100	4% of the total (1)(2)
4.0	101-200	101-200	1.0 space plus 3% of the total (2)
5.0	201-1 000	201-1 000	2.0 spaces plus 2% of the total (2)
6.0	1 001 and greater	1 001 and greater	11.0 spaces plus 1% of the total (2)

NOTES: (1) See Sentence 3.1.3.1.1 of this By-law.
(2) See Sentence 3.1.3.1.2 of this By-law.
(3) *deleted by 0018-2021*.

3.1.1.12 Electric Vehicle Ready Parking Spaces

3.1.1.12.1
Electric vehicle ready parking spaces shall be provided in accordance with Table 3.1.1.12 - Minimum Required Number of Electric Vehicle Ready Parking Spaces. (0117-2022)

Table 3.1.1.12 - Minimum Required Number of Electric Vehicle Ready Parking Spaces

Column	A	B
Line 1.0	**TYPE OF USE**	**MINIMUM NUMBER OF REQUIRED ELECTRIC VEHICLE READY PARKING SPACES**
2.0	**Detached Dwelling**, **Linked Dwelling**, **Semi-Detached**, **Street Townhouse**, **Duplex**, **Triplex**, **Back to Back** and **Stacked Townhouse**	1.0 of the required **parking spaces** with an exclusive use **garage**
3.0	Condominium and Rental **Apartment**, resident parking	20% of the total required **parking spaces** or 1.0 space, whichever is greater
4.0	Condominium and Rental **Apartment**, visitor parking	10% of the total required **parking spaces** or 1.0 space, whichever is greater
5.0	**Back to back** and **stacked townhouse**, without exclusive use **garage** and/or **driveway**	20% of the total required **parking spaces** or 1.0 space, whichever is greater

Column	A	B
Line 1.0	TYPE OF USE	MINIMUM NUMBER OF REQUIRED ELECTRIC VEHICLE READY PARKING SPACES
6.0	Non-residential **uses** identified in Table 3.1.2.2 of this By-law, with a **parking structure** with 10 or more **parking spaces**	10% of the total required **parking spaces** or 1.0 space, whichever is greater

3.1.1.12.2
Notwithstanding Sentence 3.1.1.12.1 of this By-law, required **electric vehicle ready parking spaces** shall only be required for the construction of new **buildings**, or portions thereof, effective June 8, 2023.

3.1.1.12.3
Notwithstanding Sentence 3.1.1.12.1 of this By-law, **electric vehicle ready parking spaces** shall not be required for **transitional housing**.

3.1.1.12.4
Notwithstanding Sentence 3.1.1.12.2 of this By-law, **electric vehicle ready parking spaces** shall not be required for any additions to an **existing building** that adds three or less **dwelling units**.

3.1.2.1.2
Visitor **parking spaces** shall not be required for an **apartment** legally **existing** within CC1 to CC4 zones for which a building permit has been issued on or before May 29, 2009. (0207-2008), (0174-2017), (0018-2021), (0117-2022)

3.1.2.2.1
Where permanent fixed seating in an arena, **entertainment establishment** or **place of religious assembly** is an open-style bench, each 0.5 m of bench is equal to one seat for the purpose of calculating required parking. (0018-2021)

3.1.2.2.2
For the purpose of Article 3.1.2.2 of this By-law, a **manufacturing facility** (multiple-occupancy mixed use **building**) is a **building(s)**, occupied by more than one occupant located on one **lot**, primarily used for **manufacturing**, **warehouse/distribution** and/or **wholesaling facilities**, but may contain other non-manufacturing, non-warehouse/
distribution and/or non-wholesaling facilities. Where the non-manufacturing, non-warehouse/distribution and/or non-wholesaling facilities exceed 50% of the total **gross floor area - non-residential** of the site, separate parking will be required for all **uses** in accordance with the regulations contained in Table 3.1.2.2 of this By-law. (0325-2008), (0379-2009), (0190-2014), (0018-2021)

3.1.2.2.3
For the purpose of Article 3.1.2.2 of this By-law, a **warehouse/distribution facility**, **wholesaling facility** (multiple-occupancy **building**) is a **building(s)** occupied by more than one occupant located on one **lot**, where the primary function of all occupants is warehousing, distribution or wholesaling. (0379-2009), (0018-2021)

3.1.2.2.4

For the purpose of Article 3.1.2.2 of this By-law, where a single occupant **office building** includes a **manufacturing**, **warehouse/distribution** and/or **wholesaling facility** component and the **GFA - non-residential** of the **manufacturing**, warehouse/ distributi and/or **wholesaling facility** component is greater than 10% of the total **GFA - non-residential** of the **building**, parking for the **manufacturing**, warehouse/ distributi and/or **wholesaling facility** component shall be calculated in accordance with the applicable **manufacturing**, **warehouse/distribution** and/or **wholesaling facility** (single occupancy) regulations contained in Table 3.1.2.2 of this By-law. (0308-2011), (0018-2021)

3.1.3.1.1

Where only one **accessible parking space** is required, a Type A **accessible parking space** shall be provided. (0018-2021)

3.1.3.1.2

Where more than one **accessible parking space** is required:
(0018-2021)

(1) if an even number of **accessible parking spaces** is required, an equal number of Type A and Type B **accessible parking spaces** must be provided;
(2) if an odd number of **accessible parking spaces** is required, an equal number of Type A and Type B **accessible parking spaces** must be provided and the odd space may be a Type B **accessible parking space**.

See Illustration No. 15 - Section 1.3 - Illustrations

3.1.3.1.3

Where a shared parking arrangement is used for the calculation of required visitor/ non-residential parking, the required **accessible parking space** requirement will be calculated on either the visitor component or non-residential component. (0144-2016), (0018-2021)

3.1.6.5 Required Number of Bicycle Parking Spaces

3.1.6.5.1 Required Number of Bicycle Parking Spaces for Residential Uses

Off- **street** **bicycle parking spaces** for residential **uses** shall be provided in accordance with Table 3.1.6.5.1 - Required Number of Bicycle Parking Spaces for Residential Uses

Table 3.1.6.5.1 - Required Number of Bicycle Parking Spaces for Residential Uses

Column	A	B	C
Line 1.0	**TYPE OF USE**	**BICYCLE PARKING - CLASS A**	**BICYCLE PARKING - CLASS B**
2.0	**Apartment** and **stacked townhouse** without exclusive **garages**	0.6 spaces per unit	The greater of 0.05 spaces per unit or 6.0 spaces
3.0	**Apartment** and **stacked townhouse** without exclusive **garages** (within CC1 to CC4 and CCO zones)	0.8 spaces per unit	The greater of 0.1 spaces per unit or 6.0 spaces
4.0	**Long-Term Care Building**	0.2 spaces per 100 m^2 **GFA - residential**	0.2 spaces per 100 m^2 **GFA - residential**
5.0	**Long-Term Care Building** (within CC1 to CC4 and CCO zones)	0.3 spaces per 100 m^2 **GFA - residential**	0.3 spaces per 100 m^2 **GFA - residential**
6.0	**Retirement Building**	0.3 spaces per unit	The greater of 0.03 spaces per unit or 6.0 spaces
7.0	**Retirement Building** (within CC1 to CC4 and CCO zones)	0.4 spaces per unit	The greater of 0.05 spaces per unit or 6.0 spaces

3.1.6.6 Required Number of Bicycle Parking Spaces for Non-Residential Uses

Off-street **bicycle parking spaces** for non-residential **uses** shall be provided in accordance with Table 3.1.6.6 - Required Number of Bicycle Parking Spaces for Non-Residential Uses.

Table 3.1.6.6 - Required Number of Bicycle Parking Spaces for Non-Residential Uses

Column	A	B	C
Line 1.0	TYPE OF USE	BICYCLE PARKING - CLASS A	BICYCLE PARKING - CLASS B
2.0	**Active Recreational Use** , **Community Centre** , **Hospital** , **Library** , **Place of Religious Assembly** , and **Recreational Establishment**	0.1 spaces per 100 m^2 **GFA - non-residential**	0.1 spaces per 100 m^2 **GFA - non-residential**
3.0	**Active Recreational Use** , **Community Centre** , **Hospital**, **Library** , **Place of Religious Assembly** , and **Recreational Establishment** (within CC1 to CC4 and CCO zones)	0.3 spaces per 100 m^2 **GFA - non-residential**	0.3 spaces per 100 m^2 **GFA - non-residential**
4.0	College, University	1.0 spaces per 100 m^2 **GFA - non-residential**	1.2 spaces per 100 m^2 **GFA - non-residential**
5.0	Contractor's Yard, **Essential Emergency Service** , **Power Generating Facility** , Self Storage Facility, Utilities (**Electric Transformer and Distribution Facility** , **Sewage Treatment Plant** , **Utility Building** , **Water Treatment Facility**) and **Waste Transfer Station**	n/a	2.0 spaces
6.0	**Education and Training Facility** , **Financial Institution** , **Manufacturing Facility** , **Science and Technology Facility** , **Warehouse/Distribution Facility** , and **Wholesaling Facility**	0.1 spaces per 100 m^2 **GFA - non-residential**	2.0 spaces
7.0	**Education and Training Facility** , **Financial Institution** , **Manufacturing Facility** , **Science and Technology Facility** , **Warehouse/Distribution Facility** , and **Wholesaling Facility** (within CC1 to CC4 and CCO zones)	0.15 spaces per 100 m^2 **GFA - non-residential**	0.15 spaces per 100 m^2 **GFA - non-residential**

8.0	**Entertainment Establishment** , **Restaurant** , **Convenience Restaurant** , **Take-out Restaurant,** Retail Centre, **Retail Store** , and **Service Establishment**	0.15 spaces per 100 m^2 **GFA - non-residential**	0.2 spaces per 100 m^2 **GFA - non-residential**
9.0	**Entertainment Establishment** , **Restaurant** , **Convenience Restaurant** , **Take-out Restaurant** , Retail Centre, **Retail Store** , and **Service Establishment** (within CC1 to CC4 and CCO zones)	0.15 spaces per 100 m^2 **GFA - non-residential**	0.3 spaces per 100 m^2 **GFA - non-residential**
10.0	**Medical Office** and **Medical Office - Restricted**	0.1 spaces per 100 m^2 **GFA - non-residential**	0.1 spaces per 100 m^2 **GFA - non-residential**
11.0	**Medical Office** and **Medical Office - Restricted** (within CC1 to CC4 and CCO zones)	0.15 spaces per 100 m^2 **GFA - non-residential**	0.2 spaces per 100 m^2 **GFA - non-residential**
12.0	**Office**	0.1 spaces per 100 m^2 **GFA - non-residential**	0.1 spaces per 100 m^2 **GFA - non-residential**
13.0	**Office** (within CC1 to CC4 and CCO zones)	0.2 spaces per 100 m^2 **GFA - non-residential**	0.15 spaces per 100 m^2 **GFA - non-residential**
14.0	**Public**/**Private School**	0.1 spaces per 100 m^2 **GFA - non-residential**	0.4 spaces per 100 m^2 **GFA - non-residential**
15.0	All other non-residential **uses**	0.05 spaces per 100 m^2 **GFA - non-residential**	0.1 spaces per 100 m^2 **GFA - non-residential**

3.1.2.1.4

Notwithstanding the regulations contained in Table 3.1.2.1 of this By-law, the required number of off-street **parking spaces** for **dwelling units** that are **affordable ownership housing units** or **affordable rental housing units** located within the Inclusionary Zoning Overlay Area boundaries identified on Schedule B of Part 13 of this By-law shall be subject to a parking rate of:
(0213-2022)

(1) Precinct 1: 50% of the required number of **parking spaces** for the corresponding residential **uses** as otherwise required pursuant to this By-law;

(2) Precincts 2, 3 and 4: 70% of the required number of **parking spaces** for the corresponding residential **use** as otherwise required pursuant to this By-law.

3.1.2.1.1

Off-street parking spaces for residential uses shall be provided in accordance with Table 3.1.2.1 - Required Number of Off-Street Parking Spaces for Residential Uses. (0117-2022)

Table 3.1.2.1 - Required Number of Off-Street Parking Spaces for Residential Uses

(0207-2008), (0297-2013), (0174-2017), (0179-2018), (0181-2018/LPAT Order 2019 February 15), (0111-2019/LPAT Order 2021 March 09), (0018-2021), (0117-2022), (0213-2022), (0196-2023)

Column	A	B	C	D	E	F
Line 1.0	TYPE OF USE	UNIT OF MEASUREMENT	PRECINCT 1	PRECINCT 2	PRECINCT 3	PRECINCT 4
2.0	Condominium **Apartment**	resident spaces per unit	0.8	0.9	1.0	1.1
		visitor spaces per unit	0.2	0.2	0.2	0.2
3.0	Rental **Apartment**	resident spaces per unit	0.8	0.8	0.9	1.0
		visitor spaces per unit	0.2	0.2	0.2	0.2
4.0	**Public authority dwelling unit** or **dwelling unit** provided by a **non-profit housing provider** in a rental **apartment**	resident spaces per unit	0.4	0.6	0.65	0.7
		visitor spaces per unit	0.2	0.2	0.2	0.2
5.0	**Apartment** (within CC1 to CC4 zones)	0.8 resident spaces per unit 0.15 visitor spaces per unit (1)				
6.0	**Detached Dwelling**, **Linked Dwelling**, **Semi-Detached**, **Street Townhouse**	spaces per unit	2.0	2.0	2.0	2.0
7.0	Condominium **Detached Dwelling**, Condominium **Semi-Detached**, Condominium **Townhouse**, **Detached Dwelling** on a **CEC - Road**, **Semi-Detached** on a **CEC - Road**, **Townhouse** on a **CEC - Road**	resident spaces per unit	2.0	2.0	2.0	2.0
		visitor spaces per unit	0.25	0.25	0.25	0.25
8.0	**Duplex**, **Triplex**	spaces per unit	1.25	1.25	1.25	1.25
8.1	**Fourplex**	spaces per unit	0.5	0.5	0.5	0.5

9.0	**Dwelling units** located above a commercial development with a maximum **height** of three **storeys**	spaces per unit	1.0	1.0	1.0	1.0
10.0	**Group Home**	spaces per unit	2.0	2.0	2.0	2.0
11.0	**Back to Back** and **Stacked Townhouse** without exclusive use **garage** and **driveway**	resident spaces per unit	1.0	1.1	1.3	1.5
		visitor spaces per unit	0.25	0.25	0.25	0.25
12.0	**Back to Back** and **Stacked Townhouse** with exclusive use **garage** and **driveway**	resident spaces per unit	2.0	2.0	2.0	2.0
		visitor spaces per unit	0.25	0.25	0.25	0.25
13.0	**Long-Term Care Building**	spaces per bed	0.33	0.33	0.33	0.33
14.0	**Retirement Building**	spaces per unit	0.5	0.5	0.5	0.5
15.0	**Public authority dwelling unit** or **dwelling unit** provided by a **non-profit housing provider** in a **retirement building**	spaces per unit	0.25	0.35	0.35	0.35
16.0	**Transitional Housing**	spaces per unit or sleeping rooms, whichever is greater	0.1	0.1	0.1	0.1
17.0	All other housing forms not identified above with more than two **dwelling units**	resident spaces per unit	2.0	2.0	2.0	2.0
		visitor spaces per unit	0.25	0.25	0.25	0.25

NOTES: (1) See Sentence 3.1.2.1.2 of this By-law.
(2) deleted by 0117-2022

APPENDIX Q:

Transportation Demand Management and Pedestrian Circulation Checklist

Appendix E

Transportation Demand Management and Pedestrian Circulation Checklist

This checklist is designed to evaluate the incorporation of Transportation Demand Management (TDM) measures, including pedestrian circulation techniques, into development proposals. The template is modelled on the prototype Class 2: Medium Density/Moderate Congestion (TDM Moderate) checklist contained in *TDM Supportive Guidelines for Development Approvals* (ACT Canada, 2008).

The applicant must complete and return this checklist with their **Transportation Demand Management Plan** (TDMP) and/or **Pedestrian Circulation Plan** (PCP).

Application Summary

Development Application No: DARC 23-146 W7

Date: April 23, 2024

Applicant: GSAI

Staff: Cyrus Hiranandani

SCORE AND RATING: 92% (5 Star)

TDM SUPPORTIVE?

Yes X No

Scorecard

Use the scorecard below to determine the TDM rating and supportiveness of the development proposal based on the final score calculated on page E-5. If the proposal does not satisfy the minimum threshold, review and enhance the TDM measures.

Final Score	Rating	TDM Supportive?
91% - 100%	***** (5 Star)	YES
81% - 90%	**** (4 Star)	
71% - 80%	*** (3 Star)	
61% - 70%	** (2 Star)	NO (Review and Enhance TDM Measures)
50% - 60%	* (1 Star)	
Less than 50%	(None)	

CATEGORY A – Pedestrian Circulation					
In creating an environment that facilitates and supports pedestrian activity, the public realm needs to be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s).					
	Features	**Yes**	**No**	**N/A**	**Comments**
A1	Development located within 800 m walking distance of residential (if employment) or employment (if residential) uses	X			
A2	Development located within 400 m walking distance of retail, restaurant, or other pedestrian-oriented uses or similar services provided on-site	X			
A3	At least one functional building entrance oriented towards public space (i.e., street, park, square)	X			
A4	At least one functional building entrance located close to on-site or adjacent street transit stop	X			
A5	Nearest functional building entrance located within 50 m of (and connected to) public street with sidewalk	X			
A6	Accessible on-site pedestrian routes provided and connected to surrounding network and transit	X			
A7	Continuous sidewalks (1.5 m min. width) provided along all on-site roads and both sides of adjacent public streets	X			
A8	No conflict points between pedestrians and other users (i.e., vehicles, cyclists)	X			
A9	Adequate and properly designed pedestrian crossings provided on-site	X			
A10	Off-site road works designed to maximize pedestrian safety and minimize pedestrian crossing distances (e.g., no right turn channelization)	X			
A11	Amenities provided along pedestrian routes (i.e., benches, street furniture)		X		
A11	Shelters and benches provided at transit stops	X			
A12	Wayfinding provided to guide pedestrians	X			
A13	Lighting provided along pedestrian routes	X			
A14	Weather protection provided along pedestrian routes		X		
A15	Vehicle parking areas located away from street and pedestrian routes	X			
A16	Protected pedestrian routes provided through vehicle parking lots and linked to building(s)	X			

CATEGORY A – Pedestrian Circulation					
In creating an environment that facilitates and supports pedestrian activity, the public realm needs to be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s).					
	Features	**Yes**	**No**	**N/A**	**Comments**
A17	Passenger pick-up and drop-off areas located to side or rear of buildings, downstream from major building entrance points, but no more than 30 m away	X			
A18	Loading areas located away from street and pedestrian routes	X			
	Sub-Total	16	2	0	

CATEGORY B – Cycling Orientation					
In creating an environment that facilitates and supports cycling activity, the public realm needs to be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s).					
	Features	**Yes**	**No**	**N/A**	**Comments**
B1	On-site cycling routes provided and connected to surrounding network			X	
B2	Class A (long-term) and Class B (short-term) bicycle parking spaces provided per City of Mississauga Zoning By-law (reproduced at end of this checklist for reference)	X			
B3	Bicycle repair station provided at-grade or within underground structure close to long-term bicycle parking	X			
B4	Wayfinding provided to guide cyclists	X			
B5	Other amenities provided for cyclists (e.g., showers, change rooms)	X			
	Sub-Total	4	0	1	

CATEGORY C – Transit Service					
The availability and proximity of convenient public transit service with direct pedestrian linkages to the building expands the range of viable travel options for employees, visitors, and residents.					
	Features	**Yes**	**No**	**N/A**	**Comments**
C1	Development located within 800 m walking distance of a rapid transit station (existing or planned) or within 400 m of two or more public bus routes with minimum 15-minute headway service during peak commuter periods and every 30 minutes throughout the remainder of the day	X			
C2	Information about public transit routes, schedules, and fares provided in accessible and visible location on-site and in adjacent bus stops	X			
C3	Sufficient capacity available to accommodate transit riders generated by development	X			
	Sub-Total	6			

CATEGORY D – Motor Vehicle Parking					
The location and design of motor vehicle parking facilities can affect the character and cost of a development. Avoiding the oversupply of parking can also help reduce single occupant vehicle travel.					
	Features	**Yes**	**No**	**N/A**	**Comments**
D1	No more than the minimum number of parking spaces required by the Zoning By-law provided	X			
D2	Priority parking equivalent to 10% of employee spaces provided for carpooling/vanpooling			X	
D3	Priority parking equivalent to 3% of full-time building occupants provided for auto share and hybrid/alternative fuel vehicles	X			
D4	Priority parking equivalent to 1% of the parking stalls provided for mopeds, motorcycles, and minicars		X		
D5	Parking shared for different uses on-site and/or adjoining properties	X			
D6	50% of parking located underground or in structured parking	X			
	Sub-Total	4	1	1	

CATEGORY E – Incentives					
Building owners and tenants can offer occupants Transportation Demand Management incentives that help reduce single occupant vehicle travel.					
	Features	**Yes**	**No**	**N/A**	**Comments**
E1	TDM Plan prepared that targets a 10% reduction in peak hour trips using forecast trip generation with status quo travel characteristics	X			
E2	Building owner/tenant will provide a ride matching service for car/vanpooling			X	
E3	Building owner/tenant will provide emergency ride home options			X	
E4	Building owner/tenant will provide subsidized transit passes for all occupants for a period of at least two years	X			
E5	Building owner/tenant will charge for parking as an unbundled cost to occupants	X			
E6	Building owner/tenant will reduce cost for users of car/van pool, bicycle, moped/motorcycle/minicar spaces			X	
E7	Building owner/tenant will become a member of a local TMA and appoint a TDM Coordinator to oversee and coordinate promotional opportunities and events on site	X			
	Sub-Total	4	0	3	

SCORING SUMMARY

Count the number of applicable features for each category (items not assigned "N/A") and enter under the column "Applicable" in the table below.

Assign 1 point to each "Yes" answer, except for Category A (Pedestrian Circulation) where each "Yes" answer is worth ½ a point and Category C (Transit Service) where each "Yes" answer is worth 2 points. Award 0 points for a "No" answer. Tally the points for each category under the column "Points" in the table below.

Calculate "Final Score" as a percentage by dividing total "Points" by the total "Applicable" and enter in the table below and in the "SCORE AND RATING" field on page E-1.

Category	Possible	Applicable	Points	Comments
A – Pedestrian Circulation	9 (18/2)	18	16	
B – Cyclist Orientation	5	4	4	
C – Transit Service	6 (3x2)	6	6	
D – Motor Vehicle Parking	6	5	4	
E – Incentives	7	4	4	
TOTAL	**33**	**37**	**34**	
Score% (Points/Applicable)			**92%**	

City of Mississauga Zoning By-law Table 3.1.6.5.1- Required Number of Bicycle Parking Spaces for Residential Uses)Type of Use	Bicycle Parking Requirement (Spaces)	
	Bicycle Parking Class A (Long-Term)	Bicycle Parking Class B (Short-Term)
Apartment and stacked townhouse without exclusive 0.05 spaces per unit garages	0.6 spaces per unit	The greater of 0.05 spaces per unit or 6 spaces
Apartment and stacked townhouse without exclusive garages (within CCI to CC4 and CCO zones)	0.6 spaces per unit	The greater of 0.1 spaces per unit or 6 spaces
Long-Term Care Building	0.2 spaces per lOO m2 GFA - residential	0.2 spaces per lOO m2 GFA - residential
Long-Term Care Building (within CCI to CC4 and CCO zones)	0.3 spaces per lOO m2 GFA - residential	0.3 spaces per lOO m2 GFA - residential
Retirement Building	0.3 spaces per unit	The greater of 0.03 spaces per unit or 6 spaces
Retirement Building (within CCI to CC4 and CCO zones)	0.4 spaces per unit	The greater of 0.05 spaces per unit or 6 spaces

(Excerpt from City of Mississauga City of Mississauga Zoning By-law Table 3.1.6,6 - Required Number of Bicycle Parking Spaces for Non-Residential Uses)

Type of Use	Bicycle Parking Requirement (Spaces)	
	Bicycle Parking Class A (Long-Term)	Bicycle Parking Class B (Short-Term)
Active Recreational Use, Community Centre, Hospital, Library, Place of Religious Assembly, and Recreational Establishment	0.1 spaces per 100m^2 GFA-non-residential	0.1 spaces per 100m^2 GFA-non-residential
Active Recreational Use, Community Centre, Hospital, Library, Place of Religious Assembly, and Recreational Establishment (within CCI to CC4 and CCO zones)	0.3 spaces per 100m^2 GFA-non-residential	0.3 spaces per 100m^2 GFA-non-residential
College, University	1.0 spaces per 100 m^2 GFA non-residential	1.2 spaces per 100 m^2 GFA non-residential
College, University (within CCI to CC4 and CCO zones)	1.0 spaces per 100 m^2 GFA non-residential	1.2 spaces per 100 m^2 GFA non-residential
Contractor's Yard, Essential Emergency Service, Power Generating Facility, Self Storage Facility, Utilities (Electric Transformer and Distribution Facility, Sewage Treatment Plant, Utility Building, Water Treatment Facility) and Waste Transfer Station	n/a	2.0 spaces
Education and Training Facility, Financial Institution, Manufacturing Facility, Science and Technology Facility, Warehouse/Distribution Facility, and Wholesaling Facility	0.1 spaces per 100 m^2 GFA non-residential	2.0 spaces

Education and Training Facility, Financial Institution, Manufacturing Facility, Science and Technology Facility, Warehouse/Distribution Facility, and Wholesaling Facility (within CCI to CC4 and CCO zones)	0.15 spaces per 100 m^2 GFA non-residential	0.15 spaces per 100 m^2 GFA non-residential
Entertainment Establishment, Restaurant, Convenience Restaurant, Take-out Restaurant non-residential Retail Centre, Retail Store, and Service Establishment	0.15 spaces per 100 m^2 GFA non-residential	0.2 spaces per 100 m^2 GFA non-residential
Entertainment Establishment, Restaurant, Convenience Restaurant, Take-out Restaurant non-residential Retail Centre, Retail Store, and Service Establishment (within CCI to CC4 and CCO zones)	0.15 spaces per 100 m^2 GFA non-residential	0.2 spaces per 100 m^2 GFA non-residential
Medical Office and Medical Office - Restricted	0.1 spaces per 100 m^2 GFA non-residential	0.1 spaces per 100 m^2 GFA non-residential
Medical Office and Medical Office - Restricted (within CCI to CC4 and CCO zones)	0.15 spaces per 100 m^2 GFA non-residential	0.2 spaces per 100 m^2 GFA non-residential
Office	0.1 spaces per 100 m^2 GFA non-residential	0.1 spaces per 100 m^2 GFA non-residential
Office (within CCI to CC4 and CCO zones)	0.15 spaces per 100 m^2 GFA non-residential	0.2 spaces per 100 m^2 GFA non-residential
Public School and Private School	0.1 spaces per 100 m^2 GFA non-residential	0.4 spaces per 100 m^2 GFA non-residential
Public School/Private School (within CCI to CC4 and CCO zones)	0.1 spaces per 100 m^2 GFA non-residential	0.4 spaces per 100 m^2 GFA non-residential
All other non-residential uses	0.05 spaces per 100 m^2 GFA non-residential	0.1 spaces per 100 m^2 GFA non-residential
All other non-residential uses (within CCI to CC4 and CCO zones)	0.05 spaces per 100 m^2 GFA non-residential	0.1 spaces per 100 m^2 GFA non-residential

APPENDIX R:

Certification Form

Appendix A

Certification Form

Individuals submitting reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Mississauga's Official Plan, Transportation Master Plan, and Transportation Impact Study Guidelines.

By submitting the attached report (and any associated documents) and signing this document, I acknowledge that:

- I have reviewed and have a sound understanding of the objectives, needs, and requirements of the City of Mississauga's Official Plan, Transportation Master Plan, and the Transportation Impact Study Guidelines as they apply to this submission;
- I have sound knowledge of industry standard practices pertaining to the preparation of development-related transportation study reports;
- I have substantial experience (more than five years) in completing development-related transportation studies and strong background knowledge of the transportation planning and engineering principles underpinning these studies; and
- I am registered as a Professional Engineer (P.Eng.), Licensed Engineering Technologist (LET), Certified Engineering Technologist (C.E.T.), or Registered Professional Planner (RPP) in good standing in the Province of Ontario with specific training in transportation planning and engineering.

Dated at Toronto (City) this 17th day of September, 20 24.

Name: Michael Linton

Professional Title: Professional Engineer (P.Eng.)

Signature: Michael Linton

Office Contact Information (Please Print)

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