TRANSPORTATION IMPACT STUDY UPDATE

805 DUNDAS STREET EAST

CITY OF MISSISSAUGA
REGION OF PEEL

KJC PROPERTIES INC.

PREPARED BY:

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SEPTEMBER 2022
UPDATE: JUNE 2023

CFCA FILE NO. 2297-6402

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Revision Number	Date	Comments
Rev.0	October 2022	Issued for First Submission
Rev.1	June 2023	Issued for Second Submission

1.0 Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by KJC Properties Inc. to conduct a Transportation Impact Study in support of a proposed mixed-use residential and non-residential development located at 805 Dundas Street East in the City of Mississauga. The Transportation Impact Study Update herein, addresses the City staff comments dated March 31, 2023, April 1, 2023, and April 13, 2023, as well as summarizes the most recent Site Plan changes.

The analysis undertaken herein was completed using the Site Plan prepared by Kirkor Architects and Planners, dated June 15, 2023. Any minor changes to the Site Plan are not expected to materially affect the conclusions set out within this report.

The proposed mixed-use development envisions the construction of three (3) attached townhouse blocks and one (1) 12-storey mixed-use residential tower with ground-floor non-residential space. In total, 399 residential apartment units, 20 townhouse units, and 2,374 m^2 of non-residential space is proposed at the site. The site proposes a total of 526 vehicle parking spaces as well as a full moves access at Haines Road.

Existing Conditions

Under 2022 existing conditions, all study intersections operate with a Level of Service (LOS) "C" or better for the A.M. and P.M. peak periods, with the exception of the intersection of Dundas and Tomken Road operating with a LOS "D" during the P.M. peak. The southbound left-turn movement intersection of Dundas and Haines Road currently nears capacity during the A.M. peak. The southbound through movement at Dundas and Tomken nears capacity during the A.M. peak and exceeds capacity during the P.M. peak, along with the eastbound left-turn which also exceeds capacity during the P.M. peak.

As elaborated within the body of the report, it is noted that overcapacity movements are not technically possible under existing conditions, however, the aggressive growth rate applied to older counts and potential signal timing differences between the period that the original 2014 and 2015 counts were collected, and the 2022 signal timing plans are likely causes of this result.

Future Background Conditions

The study intersections operate very similarly to existing conditions under 2027 future background volumes, and most operational issues identified in the future background horizon were previously identified under existing conditions. Notably, the near capacity southbound through movement at Dundas and Tomken during the A.M. peak slightly exceeds capacity with the addition of background growth and traffic.

To address the operational concerns, signal optimization is proposed at the intersections of Dundas Street East at Haines Road, during the A.M. peak, and Dundas Street East at Tomken Road, during the A.M. and P.M. peaks. The results of the signal optimization found that the southbound left-turn movement at Dundas and Haines would slightly improve, but still operate with a critical volume-to-capacity ratio of 0.96.

The intersection of Dundas and Tomken improves to have no overcapacity movements during the A.M. peak. Additionally, the eastbound left-turn movement at Dundas/Haines during the P.M. peak does improve to operate under capacity but still with a critical volume-to-capacity of 0.94.

As the southbound left-turn movement Dundas Street East at Haines Road during the A.M. peak period is still critical despite improvements from signal optimization, the City can consider implementing a southbound left-turn advance phase to improve the intersection's maximum volume-to-capacity ratio to 0.73.

It is recommended that the City monitors the intersections of Dundas Street East at Haines Roads and Dundas Street East at Tomken Road for additional improvements, as required.

Future Total Conditions

The most recent Site Plan proposes an unchanged number of residential units and a small increase in retail space when compared to the previous submission. Based on a review of the proposed retail trip generation, the increased retail space is forecasted to result in +2 and +1 additional trips during the A.M. and P.M. peak hours, respectively. As such, the increase in trips is minimal and is not expected to impact the traffic operations; thus, the operational analysis was not updated herein.

A review of the trip generation previously outlined (Crozier, September 2022) indicates that the Proposed Development is expected to generate 130 and 77 net two-way trips during the weekday A.M. and P.M. peak hours, respectively.

The future total operations of the study intersections are forecasted to be very similar to that of future background conditions. All operational concerns identified under future total conditions are consistent with existing and future background conditions. As such, the Proposed Development is not expected to materially impact the boundary road network.

Notably, the proposed site access is forecasted to operate well under capacity, with no operational concerns. Additionally, sight lines at the proposed access are expected to be sufficient, with an adequate corner clearance to the downstream intersection of Dundas Street East at Haines Road.

Summary of Recommended Improvements

Based on the operations outlined, a summary of the recommended improvements is outlined in **Table E1**.

Table E1: Recommendation Summary

Horizon	Recommended Improvements	Responsibility
2027 Future Background	**Required** Signal Optimizations at: • Dundas Street East at Haines Road • Dundas Street East at Tomken Road	City
	Consider: • Implementing a southbound left-turn advance phase at Dundas Street East at Haines Road • Monitoring traffic volumes in the mid- to long-term future as well as Dundas BRT to determine if additional improvements are warranted	City
2027 Future Total	**Consider**: • Continuing to monitor traffic volumes in the mid- to long-term future as well as Dundas BRT to determine if additional improvements are warranted	City
Beyond 2027 Future Total	**Planned** Capital Improvements: • Dundas BRT	Metrolinx

Vehicle Maneuverability Analysis

The Vehicle Turning Diagrams outline that all expected design vehicles (passenger vehicles, medium-single unit trucks, waste collection vehicles and fire trucks) are expected to maneuver throughout the site with no encroachments or conflicts.

Parking Review

The proposed parking supply of 526 spaces exceeds the 524 required spaces outlined in the recently amended Zoning By-Law 0225-2007.

The Proposed Development exceeds the accessible parking and electric vehicle ready parking requirements as outlined in Zoning By-Law 0225-2007.

The proposed 266 bicycle parking spaces also meet the requirements outlined in Zoning By-Law 0225-2007.

Transportation Demand Management

There are many existing and future TDM opportunities for the Subject Property. The following site-specific TDM measures are proposed:

- TDM Information Package
- Wayfinding Signage
- Pre-Loaded PRESTO Cards

- Bicycle Repair Station
- Provision of Carshare Spaces
- Unbundled Parking
- Smart Commute

In consideration of the findings of this Transportation Impact Study Update, in conjunction with the previously submitted Transportation Impact Study, the development can be supported from a transportation perspective, with the addition of the recommendations outlined in this report.

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2.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by KJC Properties Inc. to complete a Transportation Impact Study (TIS) for a proposed mixed-use residential and non-residential development at 805 Dundas Street East in the City of Mississauga. The Transportation Impact Study Update herein, addresses the City staff comments dated March 31, 2023, April 1, 2023, and April 13, 2023, as well as summarizes the most recent Site Plan changes.

The purpose of the TIS is to evaluate the impacts of the Proposed Development on the surrounding road network and recommend transportation-related mitigation measures to support the study road network, if required.

A Terms of Reference (TOR) encompassing the scope of the TIS was circulated to the City of Mississauga on May 16, 2022, and comments were received on May 30, 2022. Correspondence from the City is included in **Appendix A**.

This study has been conducted in conformance with the City of Mississauga Traffic Impact Study Guidelines (n.d.). It is noted that since the submission of the TIS (Crozier, October 2022), the City of Mississauga has released an updated Transportation Impact Study Guidelines (December 2022). As the first submission was submitted prior to the release of these guidelines, the Transportation Impact Study Update does not reflect the updated guidelines herein.

2.1 Development Proposal (UPDATED)

The most recent Site Plan proposes a high-rise mixed-use residential commercial building with 399 units and 2,374 m^2 of ground floor retail space as well as three (3) 3-storey townhouse buildings totaling 20 units. To support the development, 526 vehicles parking spaces and 266 bicycle parking spaces are provided as well as a full moves access off Haines Road.

Table 1 outlines the development proposal, as well as changes in the site statistics.

Table 1: Proposed Development Statistics (Comparison)

Building	Land Use	October 2022	June 2023
Building A	Residential (Apartment)	399 units	399 units
	Retail[1]	1,972 m^2	2,374 m^2 (+402 m^2)
Building B	Residential (Townhouse)	6 units	6 units
Building C	Residential (Townhouse)	8 units	8 units
Building D	Residential (Townhouse)	6 units	6 units
Parking Supply			
Vehicle Parking		513 spaces	526 spaces incl. 2 carshare (+13 spaces)
Bicycle Parking		461 spaces	266 spaces (-195 spaces)

Note 1: Retail gross floor area includes retail storage and retail common/service areas.

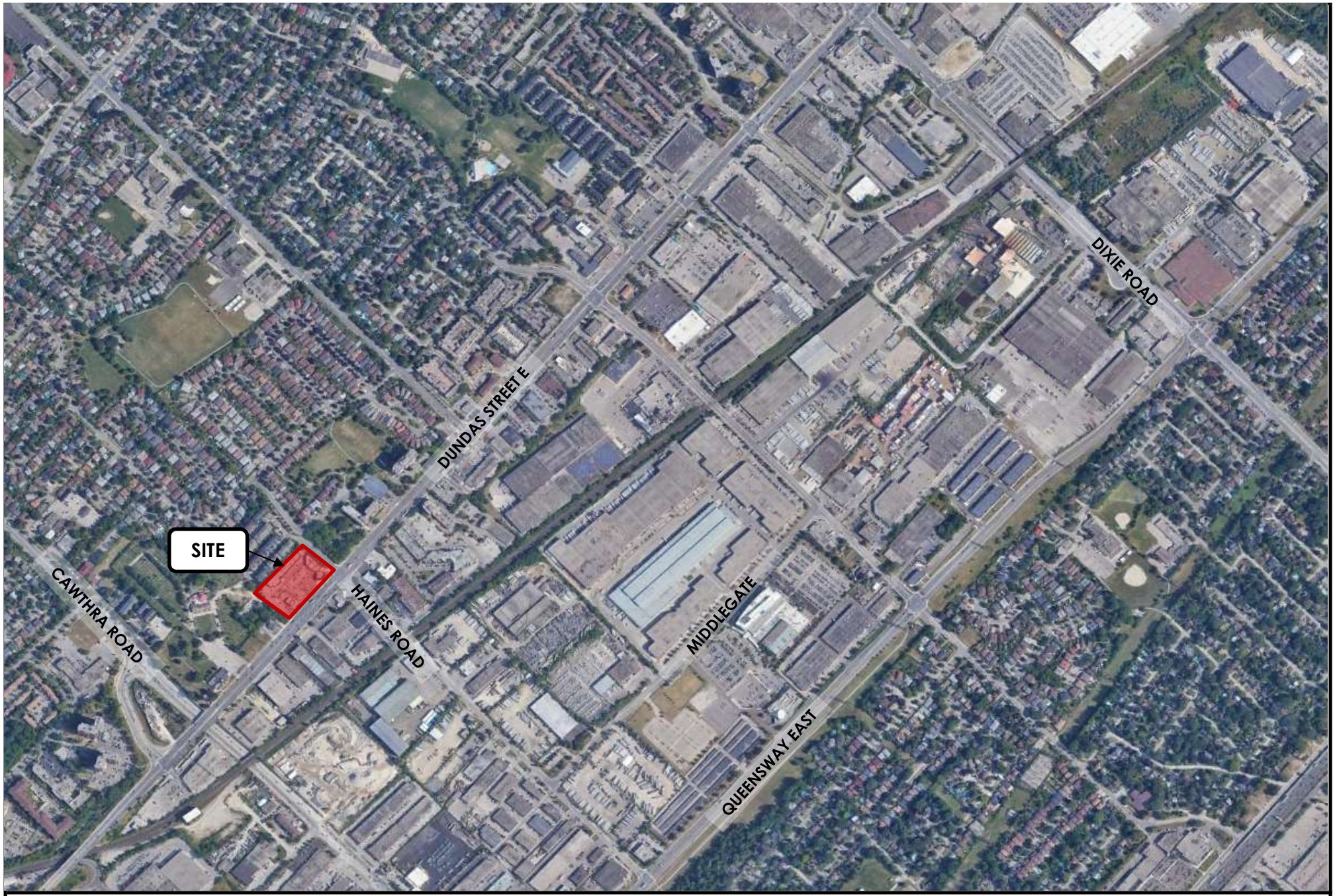
In comparison to the original development proposal, the most recent Site Plan outlines an unchanged residential development yield and a small increase in ground floor retail space.

The most recent Site Plan prepared by Kirkor Architects and Planners, dated June 15, 2023, is included in **Appendix B**.

2.2 Development Lands

The Subject Lands cover an area of approximately 3.1 acres and is bound by Haines Road to the east, Dundas Street East to the south, Cedar Creek Lane to the west, and existing residential developments to the north. The Subject Property is currently occupied by a commercial plaza and zoned as a Commercial Zone (C2) by the City of Mississauga Zoning By-Law 0225-2007.

The Site Location is included in **Figure 1.**



Legend

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

805 Dundas Street E

Site Location

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Figure 1

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3.0 Existing Conditions

The following intersections were reviewed as part of the study area per confirmation with City staff:

- Dundas Street East at Cawthra Road Ramp
- Dundas Street East at Haines Road
- Dundas Street East at Tomken Road

The following section provides a description of the study area from a transportation context, as well as a traffic operations analysis of the study road network.

3.1 Study Road Network

Dundas Street East is an east-west roadway with a six-lane urban cross-section east of Cawthra Road, and a four-lane cross-section west of Cawthra Road. The road is divided by a two-way left-turn median within the study area. Dundas Street is under the jurisdiction of the City of Mississauga and is classified as an Arterial Road in the City of Mississauga Official Plan Schedule 5 "Long Term Road Network", included in **Appendix C**. Dundas Street has sidewalks on both sides of the road in the study area and no dedicated cyclist facilities. The roadway has a posted speed limit of 60 km/h in the study area.

Cawthra Road is a north-south roadway with a four-lane urban cross-section. Cawthra Road is under the jurisdiction of Peel Region and is classified as a Regional Arterial Road per the City's Official Plan. Cawthra Road has sidewalks on both sides of the road, and a raised bicycle path adjacent to the roadway south of the ramp to Dundas Street E. The roadway has a posted speed limit of 50 km/h in the study area.

Haines Road is a north-south roadway with a two-lane urban cross-section. Haines Road is under the jurisdiction of the City and is classified as a Minor Collector under the City's Official Plan. Haines Road has sidewalks on one side of the road in the study area, with no dedicated cyclist facilities. The segment of Haines Road south of Dundas Street East has a posted speed limit of 40 km/h. The segment of Haines Road north of Dundas Street East is assumed to have a speed limit of 50 km/h.

Tomken Road is a north-south roadway with a four-lane urban cross-section. Tomken Road is under the jurisdiction of the City and is classified as a Major Collector under the City's Official Plan. Tomken Road has sidewalks on both sides of the road, and no dedicated cyclist facilities. The roadway has a posted speed limit of 50 km/h.

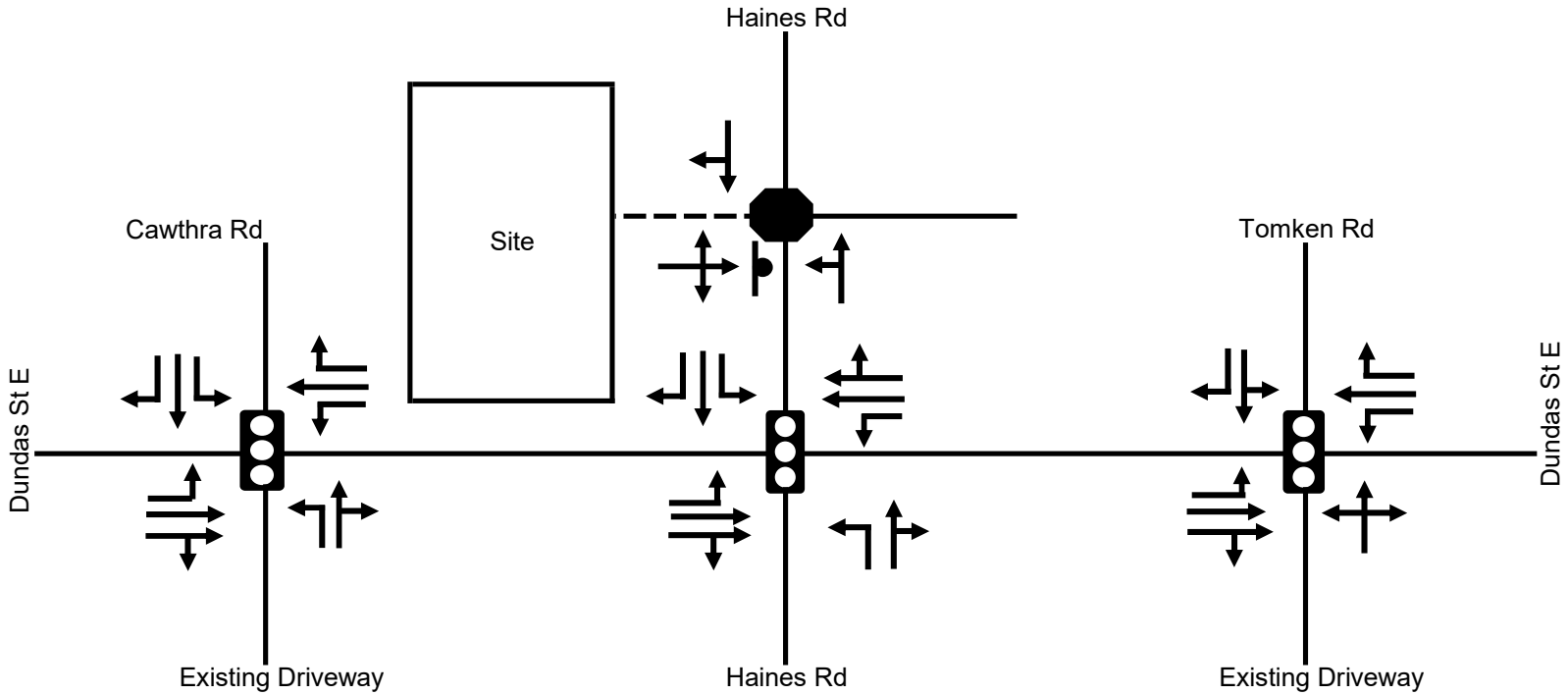
3.2 Study Intersections

The intersection of **Dundas Street East at Cawthra Road Ramp** is a four-legged signalized intersection. The northbound approach is a private access to a commercial property and consists of a single through/left-turn lane, and a single left-turn lane. The southbound approach ramp from Cawthra Road consists of a single left-turn lane, a shared through/left-turn lane, and a channelized right-turn lane. The eastbound approach on Dundas Street East consists of a single left-turn lane, a single through lane, and a shared through/right-turn lane. The westbound approach consists of an auxiliary left-turn lane, three through lanes and an auxiliary channelized right-turn lane.

The intersection of **Dundas Street East and Haines Road** is a four-legged signalized intersection. The northbound approach on Haines Road consists of an auxiliary left-turn lane and a shared through/right-turn lane. The southbound approach on Haines Road consists of a single through lane, and an auxiliary left-turn and channelized right-turn. The eastbound and westbound approaches on Dundas Street East each consist of a single auxiliary left-turn lane, two through lanes and a single shared through/right-turn lane.

The intersection of **Dundas Street East at Tomken Road** is a four-legged signalized intersection. The northbound approach from a private commercial access consists of a single shared through/left/right-turn lane. The southbound approach on Tomken Road consists of a right-turn lane and a shared through/right-turn lane. The westbound approach on Dundas Street East consists of a channelized right-turn, three through lanes, and an auxiliary left-turn lane. The eastbound approach on Dundas Street E consists of a single left-turn lane, two through lanes, and a single shared through/right-turn lane.

Figure 2 illustrates the study roadways and existing roadway configuration.



Legend

Stop Control
Signal Control
Stop Sign
Lane Movement
Existing Road
Future Road

805 Dundas Street E

Existing Roadway Configuration

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Figure 2

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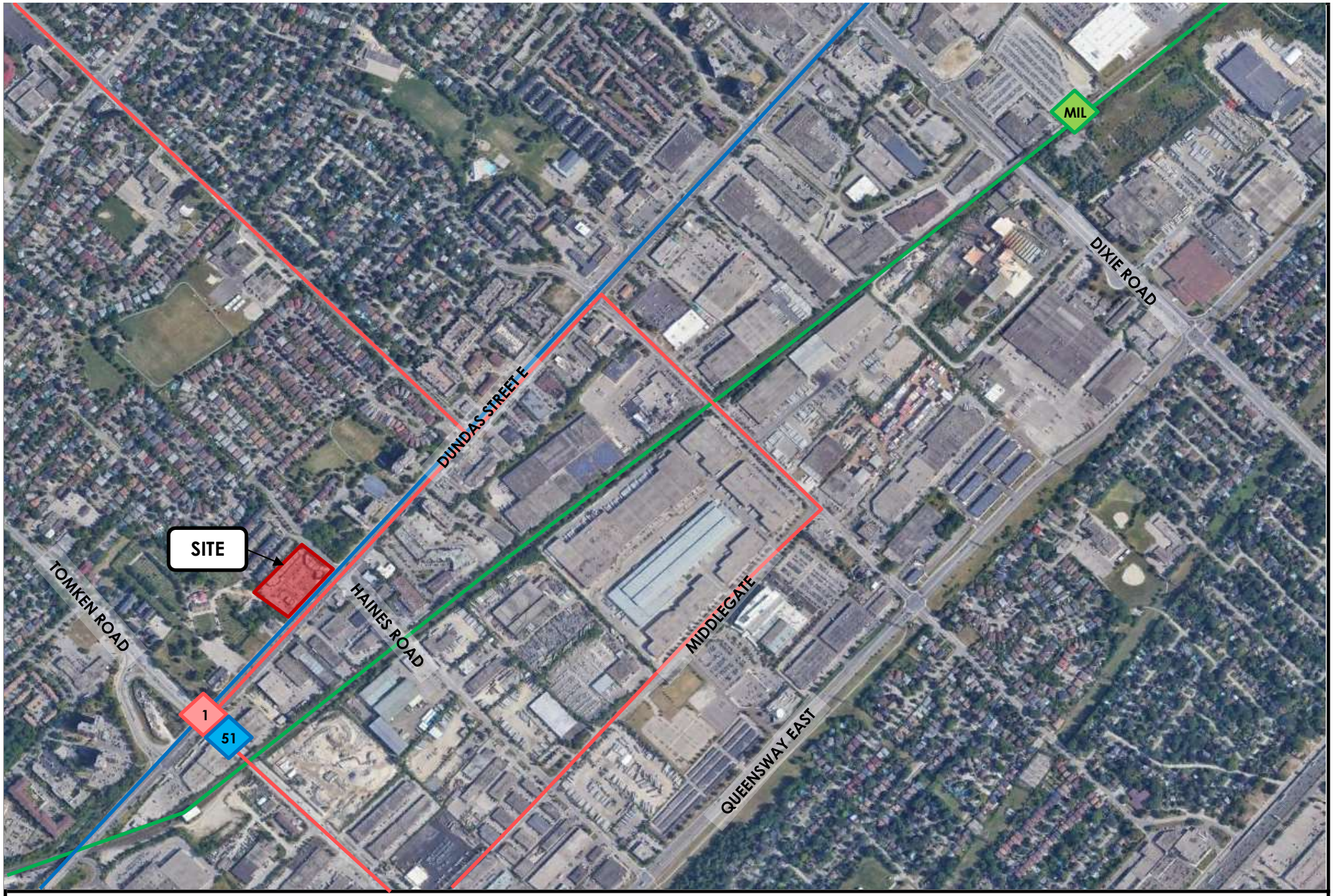
3.3 Existing Transit

MiWay Transit operates bus routes in the immediate study area, and regional transit is offered by GO Transit within a reasonable distance (via local transit) from the site.

MiWay Route 1 "Dundas" has a stop at Dundas Street and Haines Road within 100 meters (1 minute walk) of the site. This route operates in the east-west direction along Dundas Street between TTC Kipling Station to the east and Laird Road/Ridgeway Drive to the west and operates with a regular schedule on all days of the week. This route also connects to the Dixie GO Station within a 5-minute bus ride to Dixie Road at Dundas Street East and 9-minute walk south to the station.

MiWay Route 51 "Tomken" has a stop at Dundas Street and Haines Road within 200 meters (2-minute walk) of the site. This route operates primarily north-south along Tomken Road between Cardiff Boulevard to the north and Stanfield Road to the south and operates on a regular schedule on Mondays to Saturdays.

Transit maps are provided in **Appendix D**. The nearby transit stops are illustrated in **Figure 3**.



Legend

- MiWay Route 1
- MiWay Route 51
- GO Transit

805 Dundas Street E

Nearby Transit

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Figure 3

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3.4 Traffic Data

Turning movement counts and signal timing plans were provided by the City and Region for the study intersections, and the details of the counts are provided in **Table 2** below.

Table 2: Traffic Data Information

Intersection	Data	Date of Collection	Source
Dundas Street at Cawthra Ramp (South)	Turning Movement Count	May 26, 2015	Peel Region (Trans-Plan)
	Signal Timing Plan	June 8, 2022	Peel Region
Dundas Street at Haines Street	Turning Movement Count	February 4, 2014	City of Mississauga
	Signal Timing Plan	June 10, 2022	
Dundas Street at Tomken Road	Turning Movement Count	February 6, 2014	
	Signal Timing Plan	June 10, 2022	

The traffic data used for analysis has been provided in **Appendix E**.

It should be noted that following adjustments were made to the signal timing plan for Dundas Street at Cawthra Road Ramp for both the A.M. and P.M. peaks:

- Reduced the southbound walk time to 0.00 seconds and the "flash don't walk" time to 22.5 seconds, as without this adjustment, there would not be enough green time to accommodate the walk time.
- Reduced the minimum split to 15.5 seconds (minimum initial + amber + all-red). As the southbound approach has a pedestrian call button, it can be assumed this approach will not allocate the pedestrian phase as long as the pedestrian movement has been called.

3.5 Growth Rates

3.5.1 Historic Growth

Growth rates to bring historical counts to reflect 2022 existing conditions for roadways under the City of Mississauga's jurisdiction were calculated based on available historical Annual Average Daily Traffic (AADT) counts along City roadways. The AADT data is provided in **Appendix E**. All historical growth rates calculated (with the following caveats) have been provided in **Table 3**.

It is noted that no historical AADT data was available along Haines Road, thus the growth rate was assumed to be 0%, which is consistent with post 2022 growth expected for Haines Road per the City's projections also provided in **Table 3**.

Additionally, it is noted that a negative growth rate was observed along Dundas Street (for both the A.M. and P.M. peak) based on the limited AADT data available. As such, a conservative growth rate of 0.5% was applied to through movements along Dundas Street, which is also consistent with the City's projections for future growth.

Lastly, it is noted that growth along Tomken Road calculated for the P.M. peak was rounded to 2.0% based on a calculation of 2.2% growth. It should also be noted that the growth for the A.M. peak was calculated to be over 25%; this is attributed to likely erroneous/outlier data during the 2018 A.M. peak

(8:00 A.M. to 9:00 A.M.) as this data was not consistent with the pattern of traffic observed during 2017 and the volumes observed time periods before and after the 8:00 A.M. to 9:00 A.M. period during 2018. To provide a more realistic estimation of traffic growth expected along Tomken Road during the A.M. peak consistent with the City's future growth estimates, a growth rate of 2.0% was applied to through movements during the A.M. peak along Tomken Road for the 2014 to current horizon.

The City of Mississauga and Region of Peel provided future growth rates for the study horizons relevant to the study area, as summarized per **Table 3**.

Table 3: Historical and Future Growth Rates

Roadway	Direction	Peak Period	Horizon Year, Compounded Annual Growth Rate		
			2014-2021	2021-2026	2026-2027
Dundas Street	EB	A.M.	0.5%	0.5%	0.0%
		P.M.	0.5%	0.5%	0.0%
	WB	A.M.	0.5%	1.0%	0.0%
		P.M.	0.5%	0.5%	0.0%
Haines Road	NB/SB	A.M.	0.0%	0.0%	0.0%
		P.M.	0.0%	0.0%	0.0%
Tomken Road	NB	A.M.	2.0%	2.0%	0.5%
		P.M.	2.0%	2.0%	0.0%
	SB	A.M.	2.0%	2.0%	0.0%
		P.M.	2.0%	2.0%	1.0%
Roadway	**Direction**	**Peak Period**	**2016-2031**		
Cawthra Road	NB/SB	A.M./P.M.	0.5%		

Considering the age of the traffic counts dating to 7-8 years prior to the date of the TIS, and especially bearing in mind the conservative growth rate applied to Tomken Road, it is expected that the analysis contained herein provides a very conservative estimate of roadway volumes, and likely not indicative of current travel patterns. Additionally, considering the significant difference in time between the date of the traffic counts and signal timing plans, it is expected that the difference in conditions would result in analysis results not indicative of existing operations.

3.6 Traffic Modelling

The evaluation of intersections within this report is conducted based on the methodology outlined in the Highway Capacity Manual (2010), using Synchro 11 modelling software. Intersections are assessed using a Level of Service (LOS) metric, with ranges of intersection delays assigned a letter from "A" to "F". For stop-controlled intersections, a Level of Service "A" or "B" would typically be measured during off-peak hours when lesser traffic volumes are on the roadways. Levels of Service "C" through "F" would typically be observed during commuter peak hours when significant vehicle volumes would cause lengthy travel times. The Level of Service definitions for signalized and stop-controlled intersections are included in **Appendix F**.

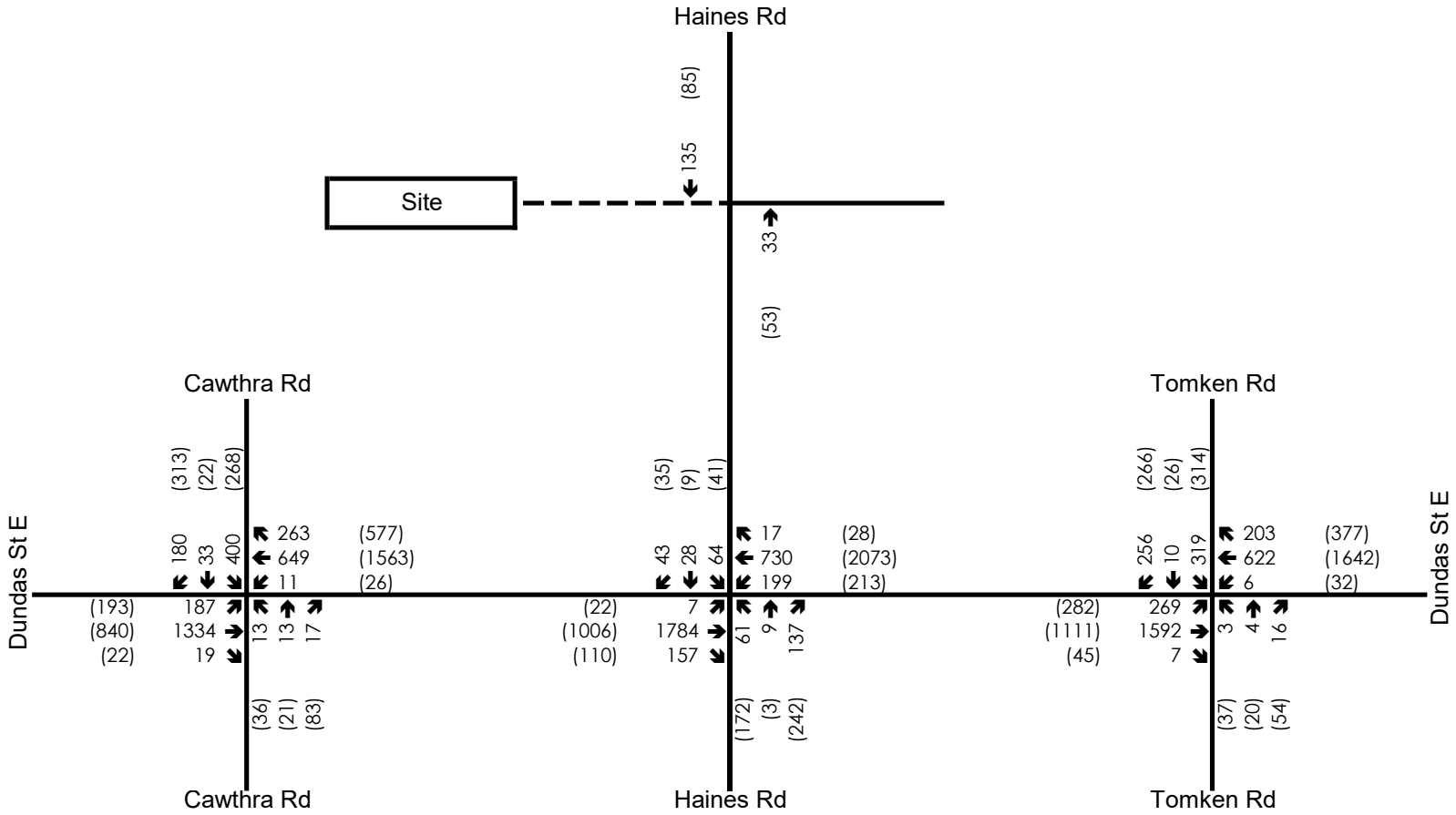
A peak hour factor of 0.92 was used for all movements.

Per the Peel Region Traffic Impact Study Guidelines, the following parameters were used to identify critically operating movements and/or intersections:

- Volume-to-capacity (v/c) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.90 or above.
- v/c ratios for exclusive movements that exceed 1.00.
- 95th percentile queue lengths for individual movements that exceed available lane storage.

3.7 Intersection Operations

The traffic operations at the study intersections were analyzed based on observed traffic volumes during the weekday A.M. and P.M. peak hours, as illustrated in **Figure 4.**



Legend		805 Dundas Street E	CROZIER CONSULTING ENGINEERS	Figure 4
xx	A.M. Peak Hour Traffic Volumes			Project No. 2297-6402
(xx)	P.M. Peak Hour Traffic Volumes	2022 Existing Traffic Volumes		Date. 2022.05.16
{xx}	Weekend Peak Hour Traffic Volumes			Analyst. FC

Table 4 summarizes the existing traffic operations within the study area. Detailed capacity analyses are included in **Appendix G**.

Table 4: 2022 Existing Operations

Intersection	Control	Peak Hour	LOS[1]	Control Delay (s)	Critical v/c Ratio[2]	95th %ile *(50th %ile)* Queue > Storage Length
Dundas Street East at Cawthra Road Ramp	Signal	A.M.	C	28.2	0.69 (SBL) 0.69 (SBT)	None
		P.M.	C	26.0	0.72 (EBL)	100m *(35m)* > 75m (EBL) 80m *(50m)* > 45m (WBR)
Dundas Street East at Haines Road	Signal	A.M.	C	21.2	0.99 (SBL)	80m *(50m)* > 20m (WBL) 50m *(25m)* > 25m (SBL)
		P.M.	B	14.2	0.78 (NBL)	55m *(25m)* > 20m (WBL) 80m *(60m)* > 75m (NBL)
Dundas Street East at Tomken Road	Signal	A.M.	C	20.5	0.99 (SBT)	35m *(15m)* > 15m (EBL)
		P.M.	D	40.0	0.97 (EBL) 1.21 (SBT)	140m *(80m)* > 15m (EBL) 100m *(55m)* > 30m (WBR)

Note 1: The LOS of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection, or any v/c ratios greater than 0.90 for through or shared through/turning movements, or greater than 1.00 for exclusive movements.

As indicated in **Table 4**, each of the study intersections operate with a LOS "C" or better during both the A.M. and P.M. peak hours, with the exception of the intersection of Dundas Street East at Tomken Road in the P.M. peak period operating at a LOS "D".

A maximum volume-to-capacity ratio of 0.69 was observed for intersection of Dundas Street East at Cawthra Road Ramp were for both the southbound left and through movements during the weekday A.M. peak hour and 0.72 for the east-bound left movement for the weekday P.M. peak hour. It is noted that the 95th percentile queues for the eastbound left and westbound right movements slightly exceed the storage length available during the P.M. weekday peak hours, however the average queue length, represented by the 50th percentile queue, is within the available storage and taper.

As indicated in **Table 4**, the intersection of Dundas Street East at Haines Road has an observed maximum volume-to-capacity ratio of 0.99 and 0.78 for the southbound left and northbound left movements for the weekday A.M. and P.M. peak hours, respectively. It is noted that the 95th percentile queues for the southbound left movement slightly exceed the storage length available during the A.M. weekday peak hours, however the average queue length (represented by the 50th percentile queue) is within the available storage and taper.

As indicated in **Table 4**, the intersection of Dundas Street East at Tomken Road has an expected maximum volume-to-capacity ratio of 0.99 and 1.21 for the southbound through movements for the weekday A.M. and P.M. peak hours, respectively. It is noted that the 95th percentile queues for the eastbound left movement slightly exceed the storage length available during the A.M. weekday peak hours, however the average queue length, represented by the 50th percentile queue, is within the available storage.

4.0 Future Background Conditions

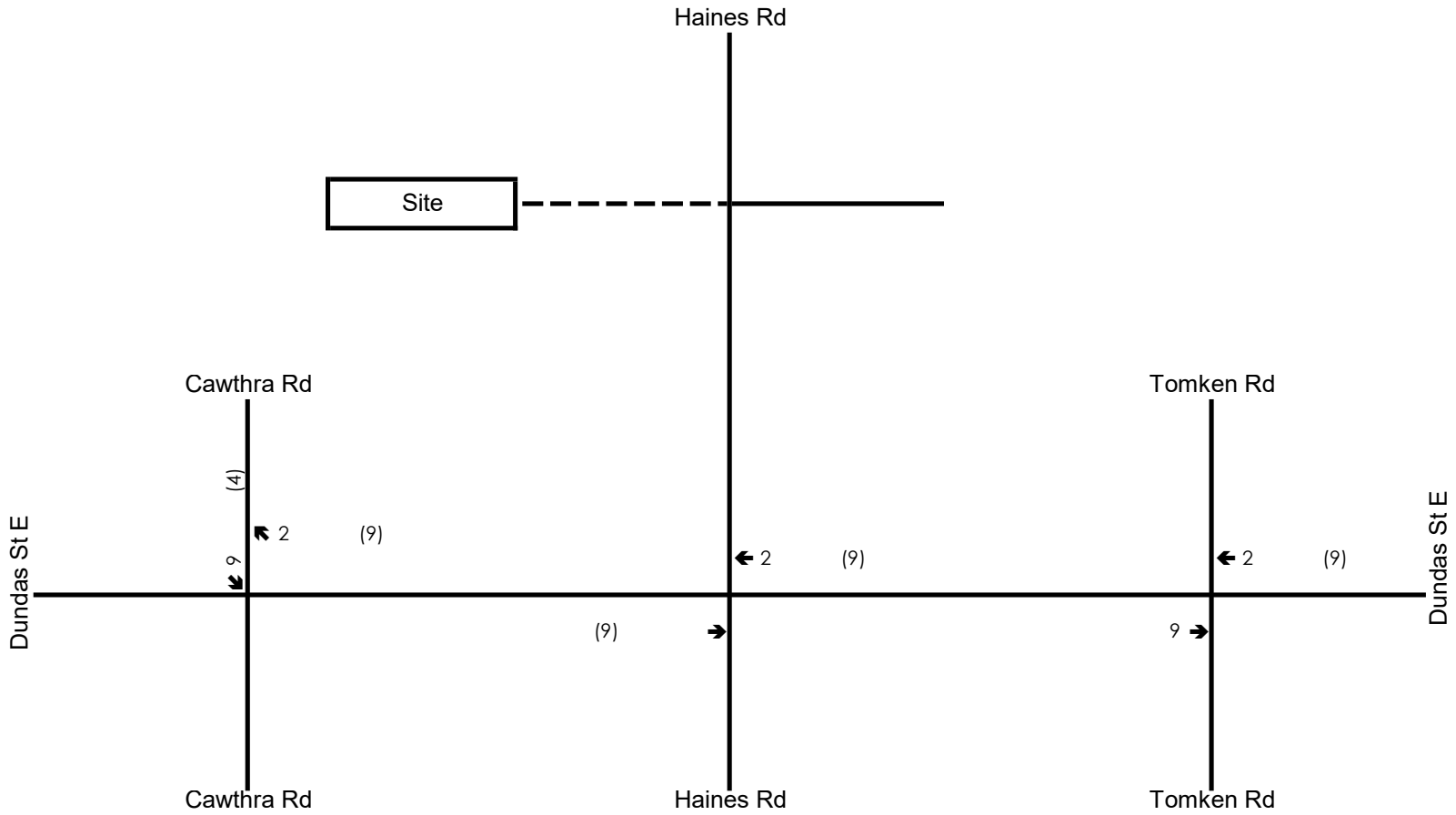
4.1 Study Horizons

Following confirmation with City of Mississauga staff, a five-year horizon year (2027) was considered appropriate for analysis purposes.

4.2 Background Developments

Per consultation with City staff, the background development of 3111-3123 Cawthra Road (SP 18-133) was identified as part of the study area.

A Traffic Impact Study for the 3111-3123 Cawthra Road was completed by NexTrans in January 2016. The development proposes the construction of 42 townhouse units and was estimated to generate 24 and 27 two-way trips during the A.M. and P.M. peak periods, respectively. The assignment of these background development trips on the study road network are illustrated in **Figure 5**.



Legend

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

805 Dundas Street E

Background Development Trips

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Figure 5

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4.3 Dundas Connects Master Plan

The Dundas Connects Master Plan (DCMP) was conducted in May 2018 by the City of Mississauga to identify improvements to the Dundas Street East corridor between Etobicoke Creek and Winston Churchill Boulevard. Several recommendations were made in this study, which are discussed in the following section. Relevant excerpts from the DCMP are provided in **Appendix H**.

4.3.1 Cawthra Focus Area (UPDATED)

Per Figure 5-10 of the DCMP, the Subject Development falls within the Cawthra Focus Area. The Cawthra Focus Area is envisioned to be a mixed-use community, with uses that promote active frontages encouraged at grade. As the Subject Development proposes a mixed-use development with residential units and ground floor retail, it is consistent with the future vision of the Cawthra Focus Area.

4.3.2 Dundas Bus Rapid Transit (UPDATED)

The DCMP recommended implementing a Bus Rapid Transit (BRT) route along the Dundas Street East corridor within the City of Mississauga, which would also connect to other municipalities, eastbound to Kipling Station in Toronto, and westbound to Hamilton.

According to Metrolinx's Dundas BRT webpage at the time of writing, the Subject Development would be located on the Mississauga East BRT line. BRT stops are proposed at Tomken Road and Cawthra Road. The proposed stops at Tomken Road and Cawthra Road would be approximately a 6-minute walk (500 meters) from the development.

Figure 5-42 of the DCMP outlines that the segment of Dundas Street East in the study area is expected to operate with a BRT Median design. As shown in Figure 5-38 of the DCMP, the cross-sectional design of the Median design includes two 3.50-meter transit lanes in the center of the roadway in addition to the existing four vehicular lanes. The new design also envisions the addition of a 2.00-meter bike lane, tree buffer lane, and sidewalks, which would integrate with storefronts along the Dundas Street frontage.

Special discussion is provided in Section 5.2.3.5 regarding the widening of Dundas Street East at the overpass over Cawthra Road, and that given the structure of the existing bridge, that a complete replacement of the bridge is recommended to accommodate the widening for the transit lanes.

It is understood that the Dundas BRT is anticipated to be in operation beyond the 2027 horizon year. As such, the Dundas BRT is not included within any future traffic operations analysis. Regardless, upon build out the Dundas BRT is expected to increase the transit accessibility of the Subject Site and increase the transit mode share within the surrounding area.

4.3.3 Roadway Improvements (UPDATED)

The DCMP recommended that the Dundas Street corridor should maintain the existing four-lane general traffic lane configuration, in addition to the transit lane median and active transportation improvements. As the Dundas BRT build out is anticipated beyond the 2027 horizon year, the additional transit lane and corresponding median is not included within the future conditions analyzed herein.

4.4 Major Transit Station Area (NEW)

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, Light Rail Transit (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 (TODs), 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.

Per the City's Major Transit Station Areas Dashboard, the Subject Development is located within the Cawthra MTSA, which will offer direct connectivity to the Dundas BRT, once complete. **Figure 6** outlines the East Harbour Major Transit Station Area.

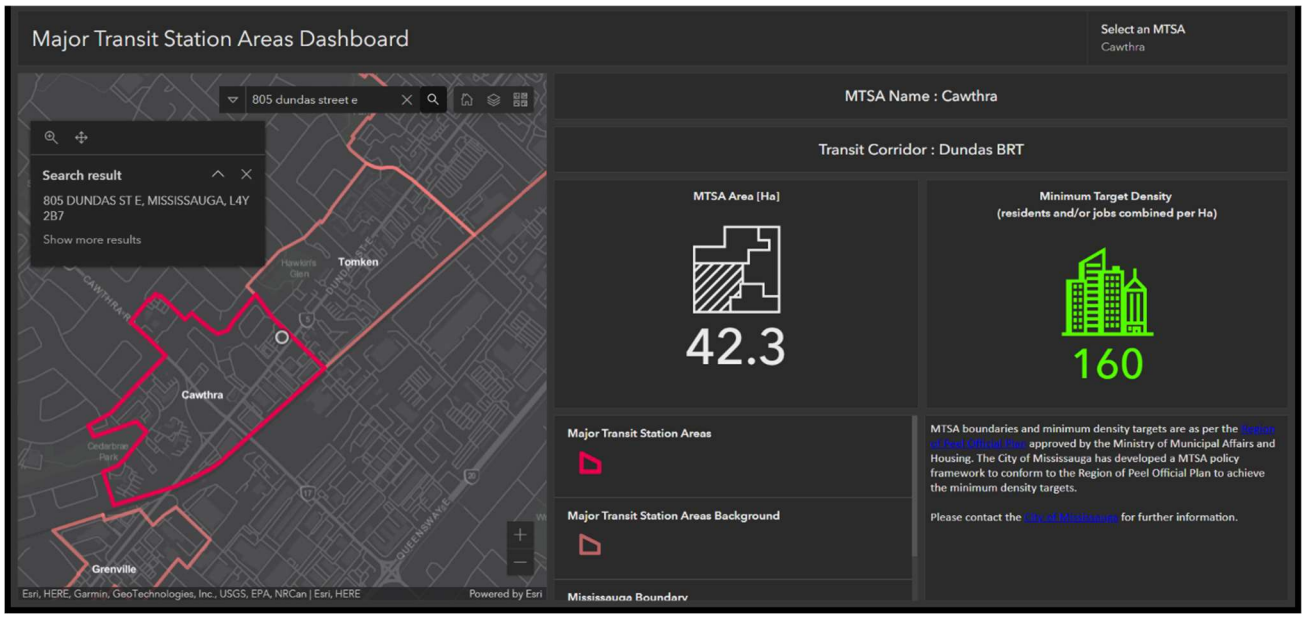
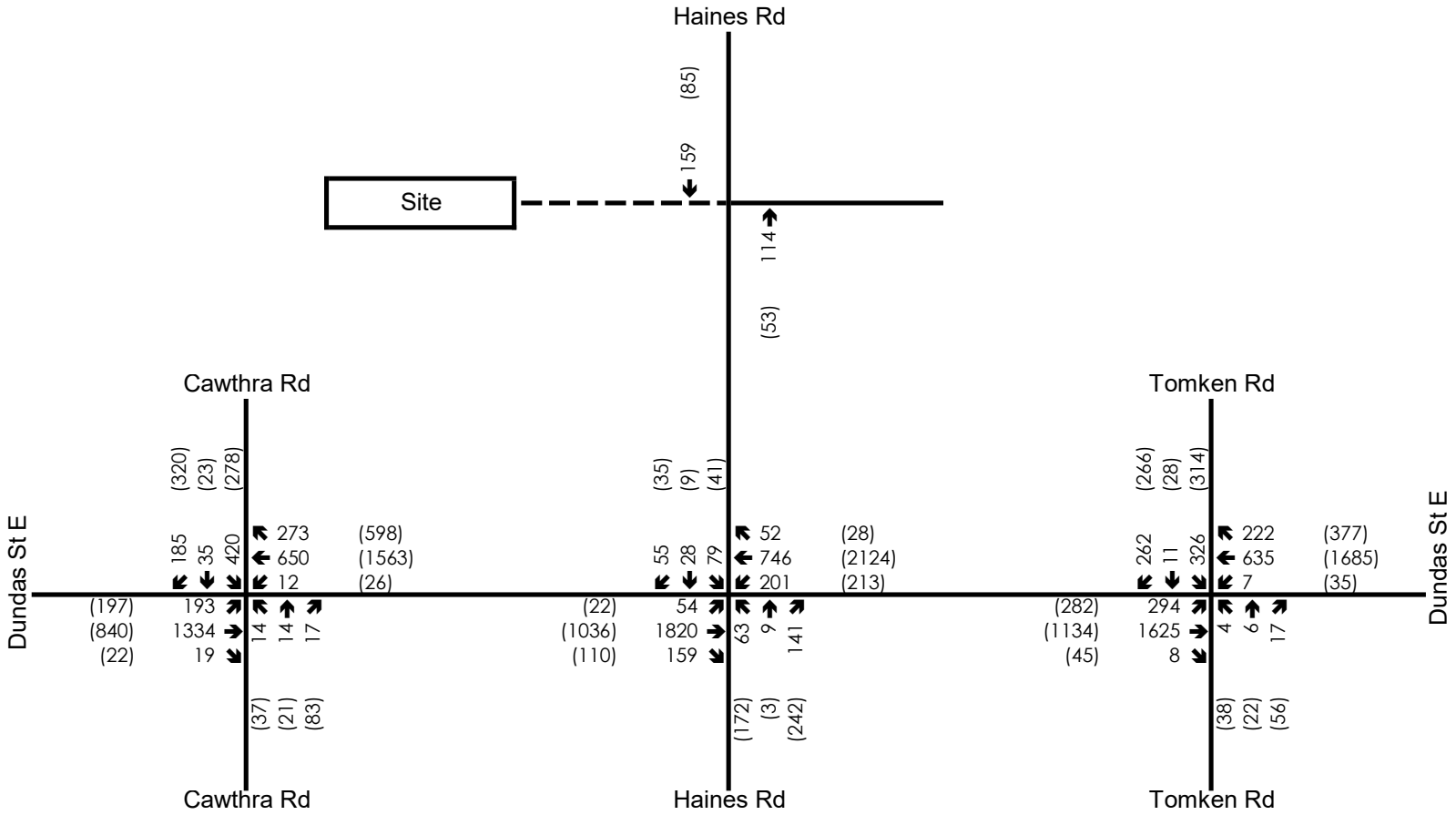


Figure 6: Cawthra Major Transit Station Area (City of Mississauga Major Transit Areas Dashboard)

4.5 Intersection Operations (UPDATED)

Traffic operations at the study intersections were analyzed following addition of volumes from associated growth rates and background developments in the vicinity of the Subject Development. The future background volumes are illustrated in **Figure 7**.



Legend

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

805 Dundas Street E

Future Background Traffic Volumes

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Figure 7

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Analyst. FC

Signal timing plans were kept consistent with existing conditions, for comparative purposes. **Table 5** summarizes the 2027 future background operations. Detailed capacity analyses are included in **Appendix I.**

Table 5: 2027 Future Background Operations

Intersection	Control	Peak Hour	LOS[1]	Control Delay (s)	Critical v/c Ratio[2]	95th %ile *(50th %ile)* Queue > Storage Length
Dundas Street East at Cawthra Road Ramp	Signal	A.M.	C	28.9	0.68 (SBL)	None
		P.M.	C	26.8	0.72 (EBL)	105m *(40m)* > 75m (EBL) 85m *(50m)* > 45m (WBR)
Dundas Street East at Haines Road	Signal	A.M.	C	22.3	0.99 (SBL)	80m *(50m)* > 20m (WBL) 50m *(25m)* > 25m (SBL)
		P.M.	B	14.4	0.78 (NBL)	55m *(25m)* > 20m (WBL) 80m *(60m)* > 75m (NBL)
	Signal Opt. #1[3]	A.M.	B	18.4	0.97 (SBL)	75m *(45m)* > 20m (WBL) 50m *(30m)* > 25m (SBL)
	Signal Opt. #2[4]	A.M.	C	20.4	0.73 (WBL)	80m *(50m)* > 20m (WBL) 40m *(25m)* > 25m (SBL)
Dundas Street East at Tomken Road	Signal	A.M.	C	21.6	1.02 (SBT)	50m *(20m)* > 15m (EBL)
		P.M.	D	41.3	1.23 (SBT) 0.99 (EBL)	150m *(85m)* > 15m (EBL) 85m *(55m)* > 30m (WBR)
	Signal Opt. #1	A.M.	C	27.1	0.82 (SBT)	100m *(40m)* > 15m (EBL) 50m *(20m)* > 30m (WBR)
		P.M.	D	41.3	0.96 (SBT) 0.93(EBL)	135m *(90m)* > 15m (EBL) 110m *(75m)* > 30m (WBR)

Note 1: The LOS of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection, or any v/c ratios greater than 0.90 for through or shared through/turning movements, or greater than 1.00 for exclusive movements.
Note 3: Signal Optimization #1 at Dundas Street at Haines Road was only applied to the A.M. peak period.
Note 4: Signal Optimization #2 at Dundas Street at Haines Road was only applied to the A.M. peak period and includes the implementation of a southbound left-turn advance phase.

As indicated in **Table 5**, each of the study intersections operate with a LOS "C" or better during both the A.M. and P.M. peak hours, with the exception of the intersection of Dundas Street East at Tomken Road operating with a LOS "D" during the P.M. peak. It is noted the future background operations are very similar to that of the existing operations noted previously; all operational or queuing concerns identified for the future background horizon were previously identified under existing conditions.

A maximum volume-to-capacity ratio of 0.68 was observed for intersection of Dundas Street East at Cawthra Road Ramp were for both the south-bound left and through movements during the weekday A.M peak hours and 0.72 for the east-bound left movement for the weekday P.M peak hours. It is noted that the 95th percentile queues for the eastbound left movement slightly exceed the storage length available during the P.M. weekday peak hours, however the average queue length (represented by the 50th percentile queue) is within the available storage.

The intersection of Dundas Street East at Haines Road has an observed maximum volume-to-capacity ratio of 0.99 and 0.78 for the southbound left and northbound left movements for the weekday A.M. and P.M. peak hours, respectively. It is noted that the 95th percentile queues for the southbound left movement slightly exceed the storage length available during the A.M. weekday peak hours, however the average queue length (represented by the 50th percentile queue) is within the available storage.

As indicated in **Table 5**, the intersection of Dundas Street East at Tomken Road has an expected maximum volume-to-capacity ratio of 0.99 and 1.23 for the eastbound left and southbound through movements for the weekday A.M. and P.M. peak hours, respectively.

4.5.1 Recommended Improvements (NEW)

Regardless of the above noted conditions above, signal optimizations were explored herein at the following intersections:

- Dundas Street East at Haines Road
- Dundas Street East at Tomken Road

Beyond the signal optimization, it is recommended that the City monitor traffic volumes at the above intersections in the mid- to long-term future as well as post-Dundas BRT to determine if additional improvements are required.

Dundas Street East at Haines Road

The signalized intersection of Dundas Street at Haines Road was optimized for the A.M. peak hour only. The intersection is expected to operate at an improved LOS "B", with an improved control delay of 18.4 seconds and an improved maximum volume-to-capacity ratio of 0.97. Although, the intersection is still operating at capacity, these conditions are consistent with existing conditions and expected in the area during the peak periods.

While signal optimization is expected to improve the operations at Dundas Street East at Haines Road, the southbound left movement is still expected to have a critical volume-to-capacity ratio. As such, the City should consider implementing a southbound left-turn advance phase (Signal Opt. #2) to mitigate the potential operational concerns. Should a southbound left-turn advance phase be implemented, the intersection is expected to operate at an unchanged LOS "C", improved control delay of 20.4 seconds and improved maximum volume-to-capacity ratio of 0.73.

Dundas Street East at Tomken Road

The optimized signalized intersection of Dundas Street East at Tomken Road is expected to operate at a LOS "D" or better, with an unchanged maximum control delay of 41.3 s or better and an improved maximum volume-to-capacity ratio of 0.96 or less. While the intersection is operating at capacity, the implementation of optimized signal timings resulted in a decrease in maximum volume-to-capacity ratio of 0.27. This is a considerable improvement in comparison to both the existing and unoptimized future background conditions. Moreover, the intersection operations are still acceptable and typical for a major arterial roadway during commuter peak periods.

5.0 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 on the boundary road intersections. The following section outlines the transportation planning impacts expected at the site, including the trip generation, trip distribution and assignment of site-generated trips.

5.1 ITE Trip Generation (UPDATED)

The Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition was used to forecast the number of trips generated by the proposed mixed-use development. As the development

proposes a variety of land uses, the following Land Use Codes (LUC) were determined to be appropriate:

- LUC 215 "Single Family Attached Housing" for the residential units in Buildings B, C, and D
- LUC 222 "Multifamily Housing (High-Rise)" for the residential units in Building A
- LUC 820 "Shopping Center" for the non-residential space in Building A

It is noted that LUC 820 was used to estimate the site-generated trips for the non-residential portion of the Proposed Development as this land use code encompasses a variety of commercial and retail land uses that may be planned for this space in the future.

Fitted curve estimates and average rates in a dense multi-use urban setting were used. Fitted curve estimates were used if available and deemed statistically valid per the ITE Trip Generation Manual (i.e., more than 20 data points and coefficient of determination $R^2 > 0.75$).

Relevant excerpts from the ITE Trip Generation Manual 11th Edition are included in **Appendix J.**

Internal trips are trips that are made between the land uses internal to the overall site without making use of the road system external to the site. For example, residents of the proposed townhouses may make trips to the ground-floor non-residential space in the high-rise building. These trips would not affect the external road network, as these trips originate and terminate internally within the site. Internal trips were calculated using the NCHRP Project 8-51 "Internal Capture Methodology for Multi-Use Developments" (2011). The origin-destination matrix of the Subject Development with internal trip estimates are shown in **Appendix K.**

Additionally, it should be noted that the site is currently occupied by a retail plaza. To account for the existing site traffic being removed from the adjacent roadways (when the Proposed Development is constructed), the existing number of site trips from the plaza was estimated and subsequently subtracted from the future total traffic estimation.

Table 6 summarizes the number of trips forecasted to be generated by the Proposed Development, as well as the existing site traffic characteristics.

Table 6: Net Site Trip Generation

Land Use	Statistic	Trip Type	Peak Hour	Trips Generated		
				Inbound	Outbound	Total
October 2022						
LUC 222 Multifamily Housing (High-Rise)	399 units	Vehicle Trips (ITE)	A.M.	71	56	127
			P.M.	36	70	107
LUC 215 Single Family Attached Housing	20 units		A.M.	3	7	10
			P.M.	6	5	11
LUC 820 Shopping Center	21,230 sqft		A.M.	11	7	18
			P.M.	35	37	72
LUC 222 Multifamily Housing (High-Rise)	399 units	Internal Trip Reduction	A.M.	-1	-1	-2
			P.M.	-10	-3	-13
LUC 215 Single Family Attached Housing	20 units		A.M.	-	-	-
			P.M.	-2	0	-2
LUC 820 Shopping Center	21,230 sqft		A.M.	-	-	-
			P.M.	-3	-10	-13
LUC 222 Multifamily Housing (High-Rise)	399 units	External Vehicle Trips	A.M.	70	55	125
			P.M.	27	67	93
LUC 215 Single Family Attached Housing	20 units		A.M.	3	7	10
			P.M.	5	5	10
LUC 820 Shopping Center	21,230 sqft		A.M.	10	6	16
			P.M.	31	28	59
Total External Vehicle Trips			**A.M.**	**84**	**68**	**151**
			P.M.	**62**	**99**	**162**
LUC 820 Shopping Center	25,040 sqft	Existing Trips	A.M.	-13	-8	-21
			P.M.	-41	-44	-85
Net Trips Generated			**A.M.**	**71**	**60**	**130**
			P.M.	**21**	**55**	**77**

As outlined in **Table 6,** the Proposed Development is expected to generate 130 and 77 net two-way trips during the weekday A.M. and P.M. peak hours, respectively.

The ground floor retail space is small, accounting for approximately 6% of the total gross floor area of the Proposed Development. As the ground floor retail is small, it is mainly expected to serve the local community and residents within the property. Therefore, mainly walking, transit and cycling trips are

expected with minimal vehicle trips anticipated. The above trip generation estimates can be considered conservative as the trips generated by the proposed ground floor retail space was included in the estimates outlined in **Table 6**, despite the minimal vehicle trips expected.

5.1.1 Proposed Retail Trip Generation (NEW)

As outlined in **Section 2.1**, the most recent Site Plan proposes an unchanged number of units and small increase in ground floor retail space. Thus, the proposed retail trip generation was reviewed to quantify the impact of the additional retail space.

Table 7 compares the proposed retail trip generation estimates.

Table 7: Proposed Retail Trip Generation (Comparison)

Land Use	Statistic	Trip Type	Peak Hour	Trips Generated		
				Inbound	Outbound	Total
October 2022						
LUC 820 Shopping Center	21,230 sqft	Vehicle Trips (ITE)	A.M.	11	7	18
			P.M.	35	37	72
		Internal Trip Reduction	A.M.	-	-	-
			P.M.	-3	-10	-13
Total External Retail Vehicle Trips			**A.M.**	**10**	**6**	**16**
			P.M.	**31**	**28**	**59**
June 2023						
LUC 820 Shopping Center[1]	21,762 sqft	Vehicle Trips (ITE)	A.M.	11	7	18
			P.M.	36	38	74
		Internal Trip Reduction	A.M.	-	-	-
			P.M.	-4	-10	-14
Total External Retail Vehicle Trips			**A.M.**	**11 (+1)**	**7 (+1)**	**18 (+2)**
			P.M.	**32 (+1)**	**28 (+0)**	**60 (+1)**

Note 1: Retail GLA includes retail storage.

The most recent Site Plan generates +2 and +1 additional trips during the weekday a.m. and p.m. peak hours, respectively. The increase in trips is minor and not expected to impact the traffic operations, thus the analysis was not updated herein.

5.2 Trip Distribution and Assignment

The Transportation Tomorrow Survey (TTS) is a comprehensive travel data survey conducted in the Greater Toronto and Hamilton Area (GHTA). Data from the 2016 TTS was used to determine the peak hour trip distribution at the site for the residential land uses and non-residential land uses proposed at the site.

The inbound and outbound residential trip distributions were derived by filtering TTS data with a trip purpose of "Home", destined to and originating from the subject GTA Zone 3669, and neighboring GTA Zones 3668 and 3674 (with residential characteristics). The A.M. and P.M. distributions were determined by filtering for trips starting during the periods of 6:30 A.M. – 9:30 A.M. and 3:30 P.M. – 6:30 P.M., respectively. **Table 8** summarizes the residential trip distribution. **Figure 8** illustrates the residential trip assignment.

Table 8: Residential Trip Distribution

Direction	A.M. Inbound	A.M. Outbound	P.M. Inbound	P.M. Outbound
Northwest	5%	9%	10%	3%
North	14%	10%	11%	6%
Northeast	16%	19%	17%	19%
East	23%	15%	17%	21%
Southeast	19%	17%	20%	17%
South	4%	4%	5%	6%
Southwest	0%	4%	5%	16%
West	19%	21%	15%	11%

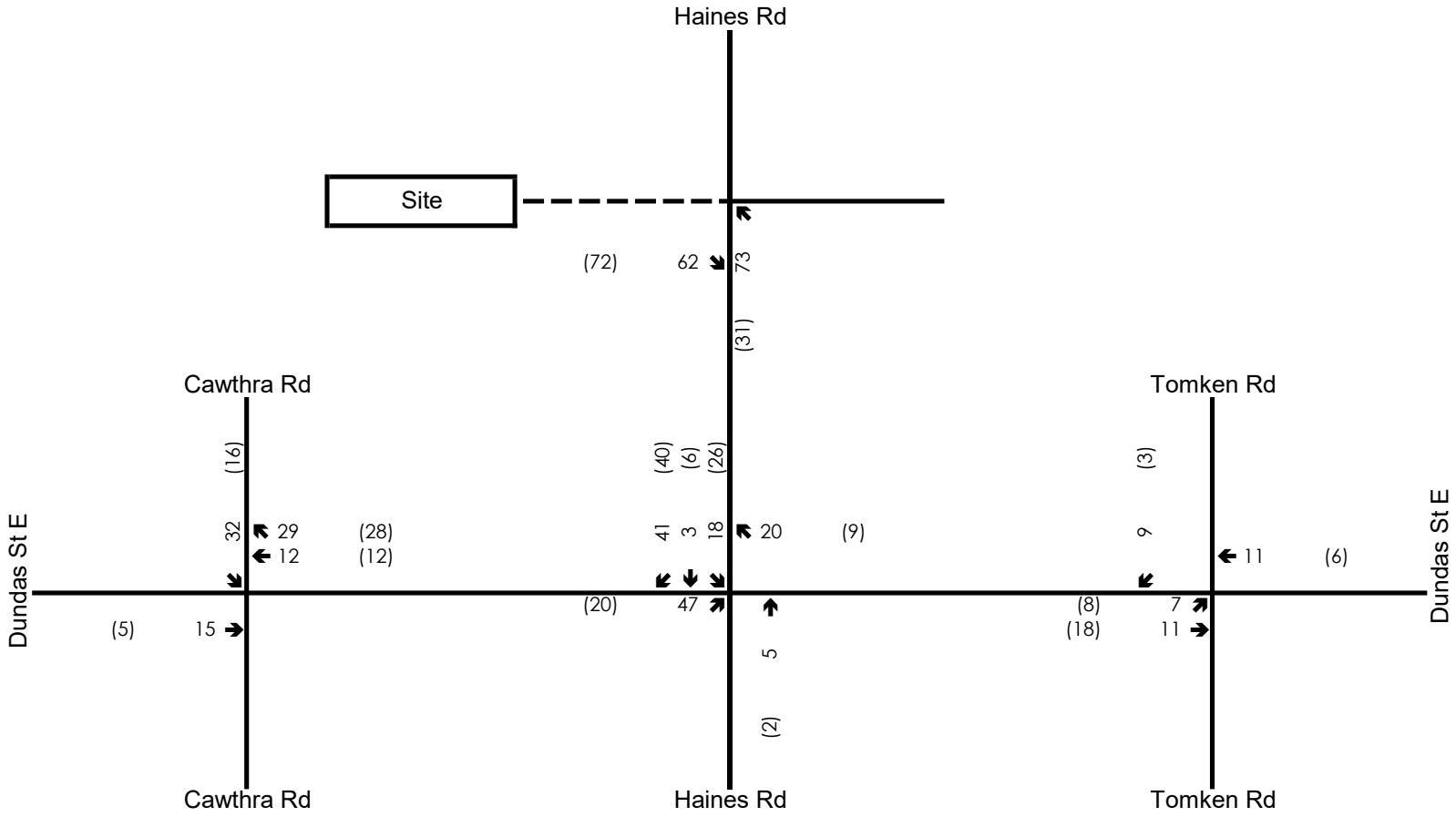
Similarly, the inbound and outbound non-residential trip distributions were filtered in a similar manner as above, with the exception that trips were filtered with the trip purpose of "Market/Shop", and the data catchment area was expanded to include the subject GTA Zone 3669, as well as GTA Zones 3668, 3659, 3660, 3667, and 3674 with mixed residential and commercial characteristics. The wider catchment area was used for the non-residential trip distribution to provide a better set of data. **Figure 9** illustrates the non-residential trip assignment.

Table 9: Non-Residential Trip Distribution

Direction	A.M. Inbound	A.M. Outbound	P.M. Inbound	P.M. Outbound
Northwest	7%	31%	19%	24%
North	28%	0%	1%	10%
Northeast	28%	13%	26%	18%
East	10%	17%	15%	13%
Southeast	0%	23%	15%	5%
South	0%	0%	8%	11%
Southwest	21%	17%	2%	5%
West	6%	0%	14%	12%

It should be noted that the non-residential trip distribution was also used to remove the existing retail trips estimated to be generated by the existing plaza on-site. The assigned trips subtracted from the future total traffic volumes are provided in **Figure 10**.

Appendix L provides the detailed TTS query results for both the residential and non-residential trip queries. The net site trip assignment is presented in **Figure 11**.



Legend

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

805 Dundas Street E

Residential Trip Assignment

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Figure 8

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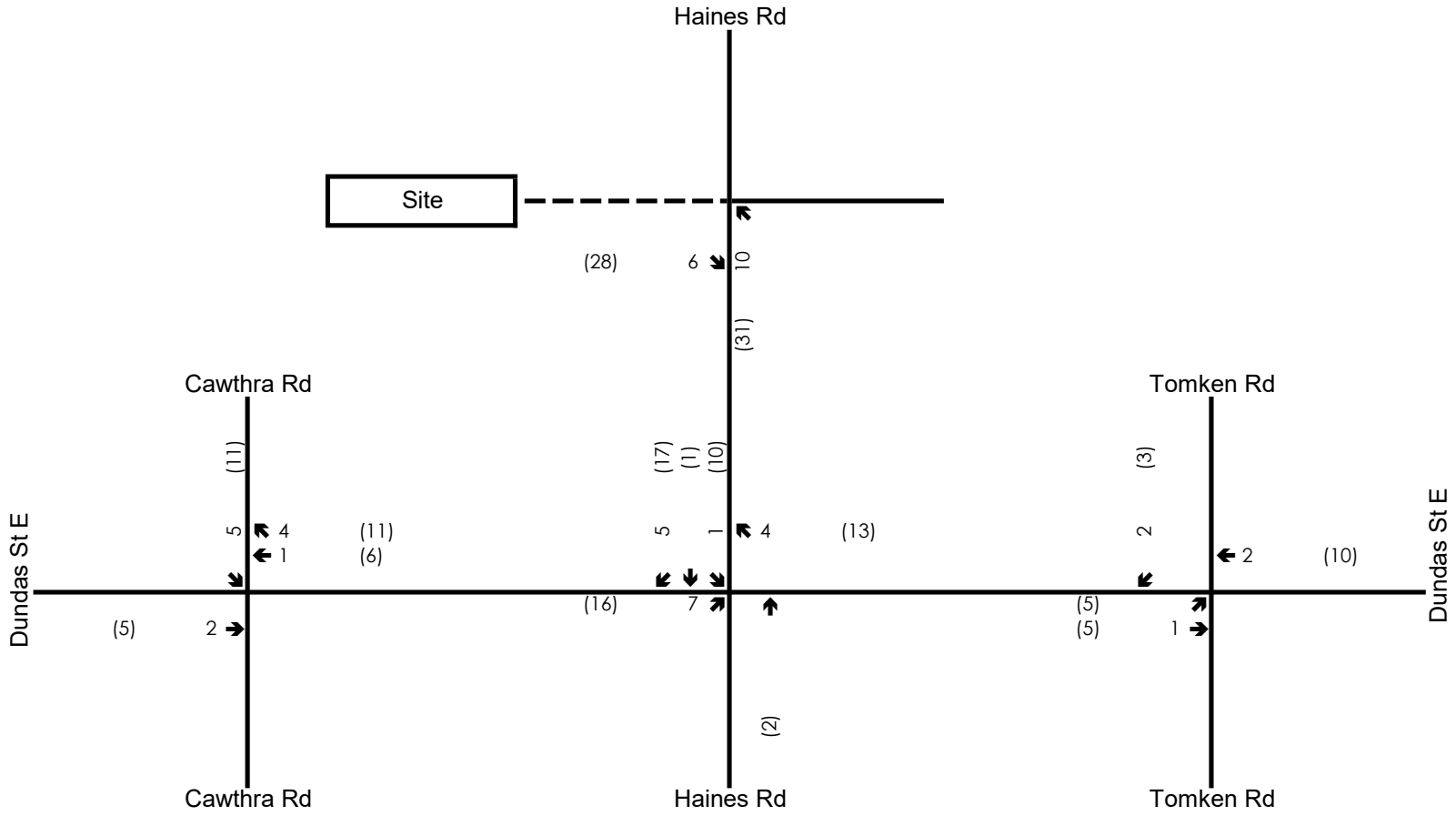

Legend

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

805 Dundas Street E

Non-residential Trip Assignment

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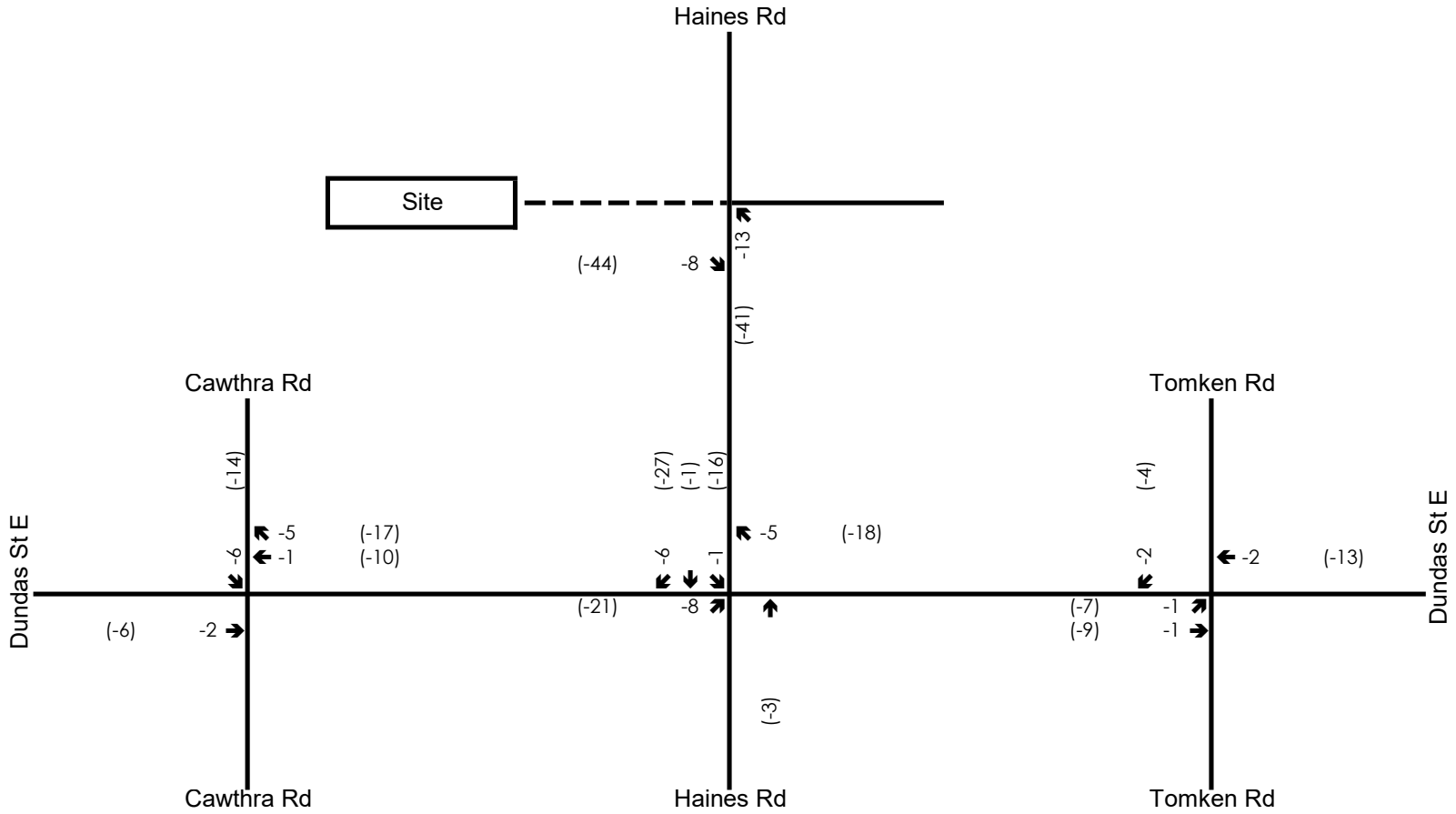
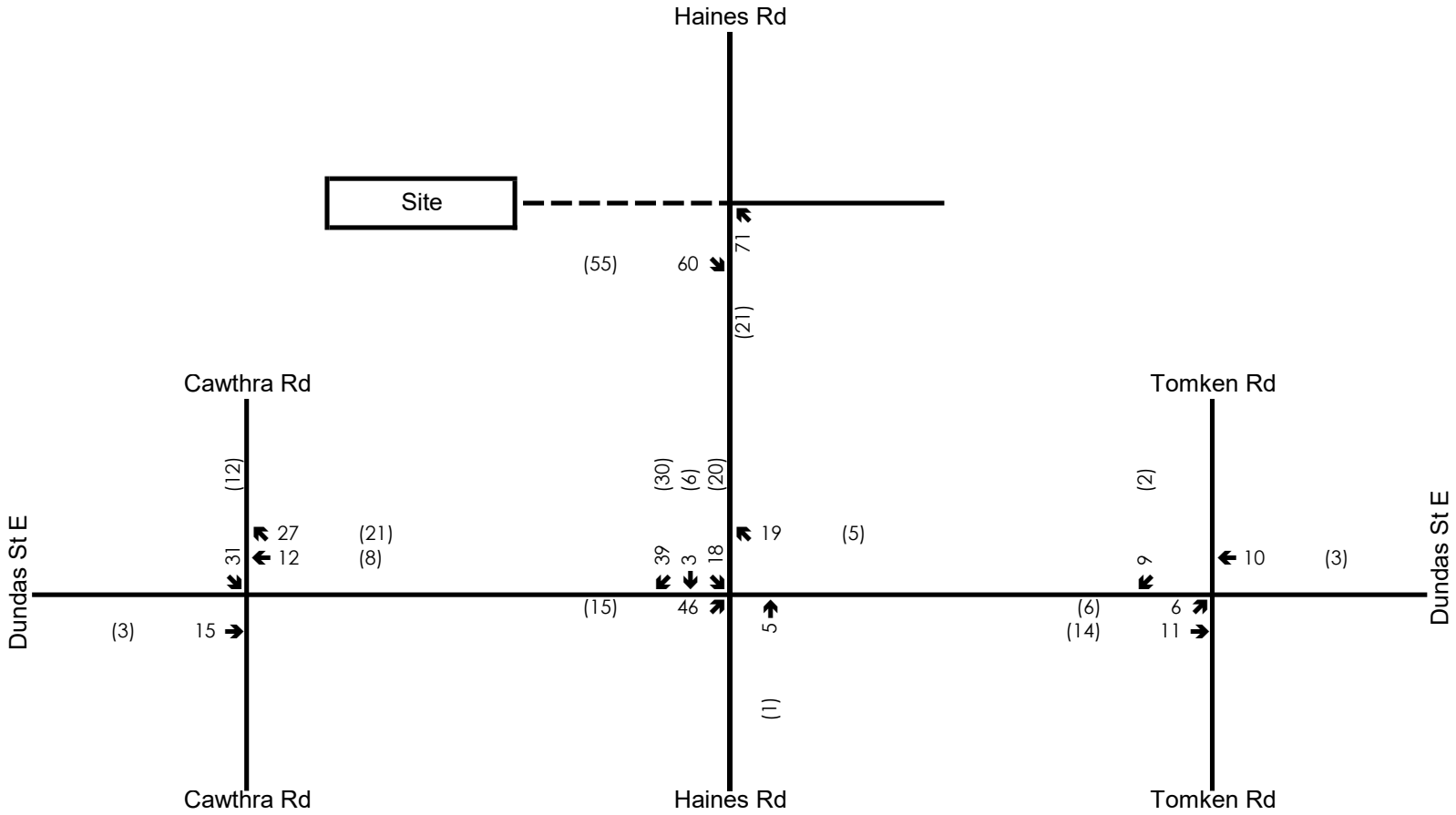
Figure 9

Project No. 2297-6402
Date. 2022.05.16
Analyst. FC



Legend		805 Dundas Street E	CROZIER CONSULTING ENGINEERS	Figure 10
xx	A.M. Peak Hour Irattic Volumes			Project No. 2297-6402
(xx)	P.M. Peak Hour Irattic Volumes	Existing Retail Trip Assignment (Deduction)		Date. 2022.05.16
{xx}	Weekend Peak Hour Irattic Volumes			Analyst. FC



Legend

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

805 Dundas Street E

Net Site Trip Assignment

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Figure 11

Project No. 2297-6402
Date. 2022.05.16
Analyst. FC

6.0 Future Total Traffic Conditions

6.1 Future Cedar Creek Lane Connection (NEW)

It is noted that City staff requested the future connection to Cedar Creek Lane be evaluated in addition to the other study intersections.

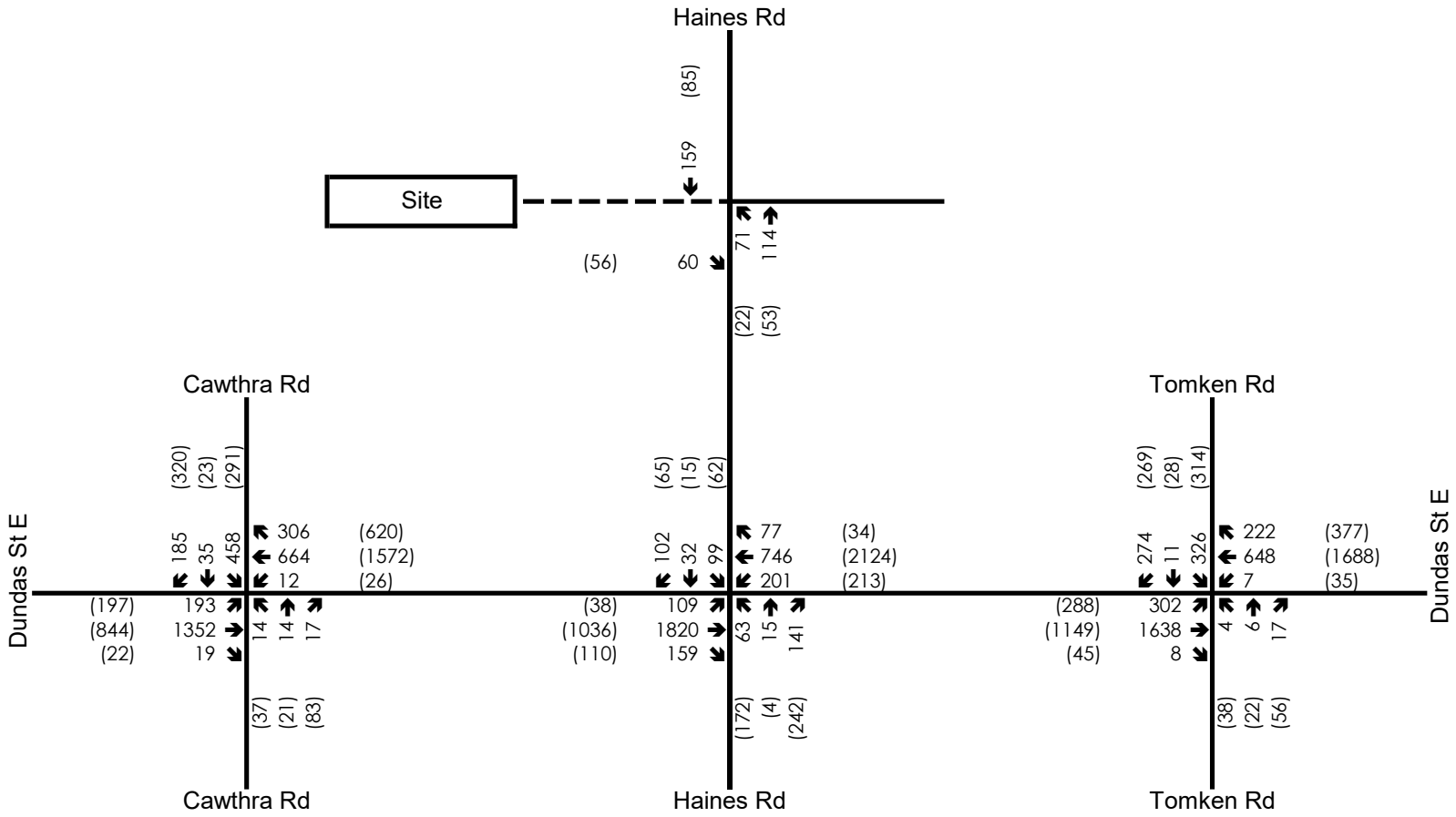
For eastbound site generated trips, it is more attractive to make a left-turn movement at the signalized intersection of Dundas Street East at Haines Road instead of the unsignalized intersection of Dundas Street East at Cedar Creek. As such, minimal to no site traffic is expected to utilize the future connection to Cedar Creek Lane.

Moreover, Cedar Creek Lane is a dead-end dirt laneway that only provides access to 737 Dundas Street East, which is currently a cemetery and crematorium. As such, Cedar Creek Lane is not an attractive route for residents and visitors of the Subject Development and minimal background traffic is expected.

Cedar Creek Lane is an unattractive route for site generated trips and minimal background traffic is anticipated, not traffic operational concerns is expected at the future Cedar Creek Lane connection, thus the future connection to Cedar Creek Lane was not analyzed herein.

6.2 Intersection Operations (UPDATED)

Traffic operations at the study intersections were analyzed with the addition of the site generated traffic to the future background traffic. The total traffic volumes are illustrated in **Figure 12**.



Legend

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

805 Dundas Street E

2027 Future Total Traffic Volumes

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Figure 12

Project No. 2297-6402
Date. 2022.05.16
Analyst. FC

Signal timing plans were kept consistent with future background conditions, for comparative purposes. **Table 10** outlines the 2027 future total operations. Detailed capacity analyses are included in **Appendix M.**

Table 10: 2027 Future Total Operations

Intersection	Control	Peak Hour	LOS[1]	Control Delay (s)	Critical v/c Ratio[2]	95th %ile *(50% %ile)* Queue > Storage Length
Dundas Street East at Cawthra Road Ramp	Signal	A.M.	C	26.4	0.70 (EBT)	None
		P.M.	C	27.2	0.74 (EBL)	105m *(40m)* > 75m (EBL) 95m *(55m)* > 45m (WBR)
Dundas Street East at Haines Road	Signal	A.M.	C	22.9	0.98 (SBL)	85m *(55m)*> 20m (WBL) 60m *(35m)*> 25m (SBL)
		P.M.	B	15.8	0.80 (SBL)	35m *(3m)*> 30m (EBL) 55m *(25m)* > 20m (WBL) 80m *(60m)* > 75m (NBL) 40m *(20m)*> 25m (SBL)
	Signal Opt. #1[3]	A.M.	C	19.2	0.96 (SBL)	80m *(45m)* > 20m (WBL) 60m *(35m)* > 25m (SBL)
	Signal Opt. #2[4]	A.M.	C	20.4	0.89 (SBL)	80m *(45m)* > 20m (WBL) 60 m *(30m)* > 25 m (SBL)
Dundas Street East at Tomken Road	Signal	A.M.	C	22.0	1.02 (SBT)	60m *(20m)* > 15m (EBL)
		P.M.	E	52.5	1.23 (SBT) 1.01 (EBL)	150m *(90m)* > 15m (EBL) 85m *(55m)* > 30m (WBR)
	Signal Opt. #1	A.M.	C	29.1	0.82 (SBT)	110m *(50m)* > 15m (EBL) 50m *(20m)* > 30m (WBR)
		P.M.	D	41.6	0.96 (SBT) 0.94 (EBL)	140m *(90m)* > 15m (EBL) 110m *(75m)* > 30m (WBR)
Site Access at Haines Road	Stop Control (Minor)	A.M.	A	9.5 (EBTR)	0.10 (SBTR)	None
		P.M.	A	9.0 (EBTR)	0.06 (EBTR)	None

Note 1: The LOS of a signalized intersection is based on the average control delay per vehicle (Synchro). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).
Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection, or any v/c ratios greater than 0.90 for through or shared through/turning movements, or greater than 1.00 for exclusive movements.
Note 3: Signal Optimization #1 at Dundas Street at Haines Road was only applied to the A.M. peak period.
Note 4: Signal Optimization #2 at Dundas Street at Haines Road was only applied to the A.M. peak period and includes the implementation of a southbound left-turn advance phase.

As indicated in **Table 10**, each of the study intersections operate with a LOS "C" or better during both the A.M. and P.M. peak hours, with the exception of the intersection of Dundas Street East at Tomken Road in the P.M. peak period at a LOS "E".

The intersection of Dundas Street East at Cawthra Road Ramp is forecasted to operate at a LOS "C" during the A.M. and P.M. peak hours. The intersection is expected to operate very similar to existing and future background conditions with low control delays and moderate volume-to-capacity ratios, indicating that no operational issues are anticipated.

The optimized intersection of Dundas Street East at Haines Road (Signal Opt. #1) is expected to operate at a LOS "C" and "B" during the future total A.M. and P.M. peak periods, respectively. The maximum control delay is expected to increase by 0.8 seconds and the maximum volume-to-capacity ratio is expected to decrease by 0.1, in comparison to optimized future background conditions (Signal Opt. #1). In addition, some queueing concerns are observed, however, this is

consistent with existing and future background conditions. Accordingly, the site generated trips are not expected to impact the traffic operations at Dundas Street East at Haines Road.

Should a southbound left-turn advance also be implemented at Dundas Street East at Haines Road (Signal Opt. #2), as outlined in **Section 4.5.1**, the intersection is expected to operate at an unchanged LOS "C" with an unchanged maximum control delay and an increase of 0.16 in maximum volume-to-capacity ratio in comparison to future background conditions with the southbound left-turn advance (Signal Opt. #2). As such, should the City implement a southbound left-turn advance at Dundas Street East at Haines Road, there are no operational concerns observed, with minimal impact from the site generated trips.

The optimized intersection of Dundas Street and Tomken Road is expected to operate at a LOS "D" or better during future total conditions. The maximum control delay is expected to increase by 0.3 seconds and an unchanged maximum volume-to-capacity ratio, in comparison to future background conditions. The capacity and queuing concerns observed are consistent with existing and future background conditions. These metrics indicate that the site generated trips do not materially alter the traffic operations and no improvements are future total warranted.

As indicated in **Table 10**, the proposed site access is expected to operate efficiently, with a LOS "A" and no operational or queueing concerns observed.

Overall, the site generated trips are not expected to materially impact the traffic operations within the study area and no improvements are required for future total conditions. It is recommended that the City continue to monitor the traffic volumes at the intersections of Dundas Street East at Haines Road and Dundas Street East at Tomken Road to determine if additional improvements are warranted.

7.0 Recommendation Summary (UPDATED)

Table 11 outlines the recommended improvements for each horizon year.

Table 11: Recommendation Summary

Horizon	Recommended Improvements	Responsibility
2027 Future Background	**Required** Signal Optimizations at: • Dundas Street East at Haines Road • Dundas Street East at Tomken Road	City
	Consider: • Implementing a southbound left-turn advance phase at Dundas Street East at Haines Road • Monitoring traffic volumes in the mid- to long-term future as well as Dundas BRT to determine if additional improvements are warranted	City
2027 Future Total	**Consider**: • Continuing to monitor traffic volumes in the mid- to long-term future as well as Dundas BRT to determine if additional improvements are warranted	City
Beyond 2027 Future Total	**Planned** Capital Improvements: • Dundas BRT	Metrolinx

8.0 Site Access Review

8.1 Sight Distance

The available sightlines at the proposed site access 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 Site access using the following assumptions:

- A standard driver eye height of 1.08 m for a passenger car.
- A 4.4 m setback from the approximate extension of the outer curb to represent a vehicle waiting to exit the Site.

Intersection sight distance 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)

Table 12 summarizes the required and available sight lines at the proposed site access.

Table 12: Sight Distance Analysis

Feature	Haines Road Site Access	
	Left Turn Maneuver	Right Turn Maneuver
Access Type	Full Moves	
Assumed Speed Limit of Roadway	50 km/h	
Assumed Design Speed	60 km/h	
Grade of Roadway	Less than 3%	
Horizontal Alignment of Roadway	Straight	
Base Time Gap[1]	7.5 s	6.5 s
Required Sight Distance[2]	130 m	110 m
Available Sight Distance	To Intersection	To Stop

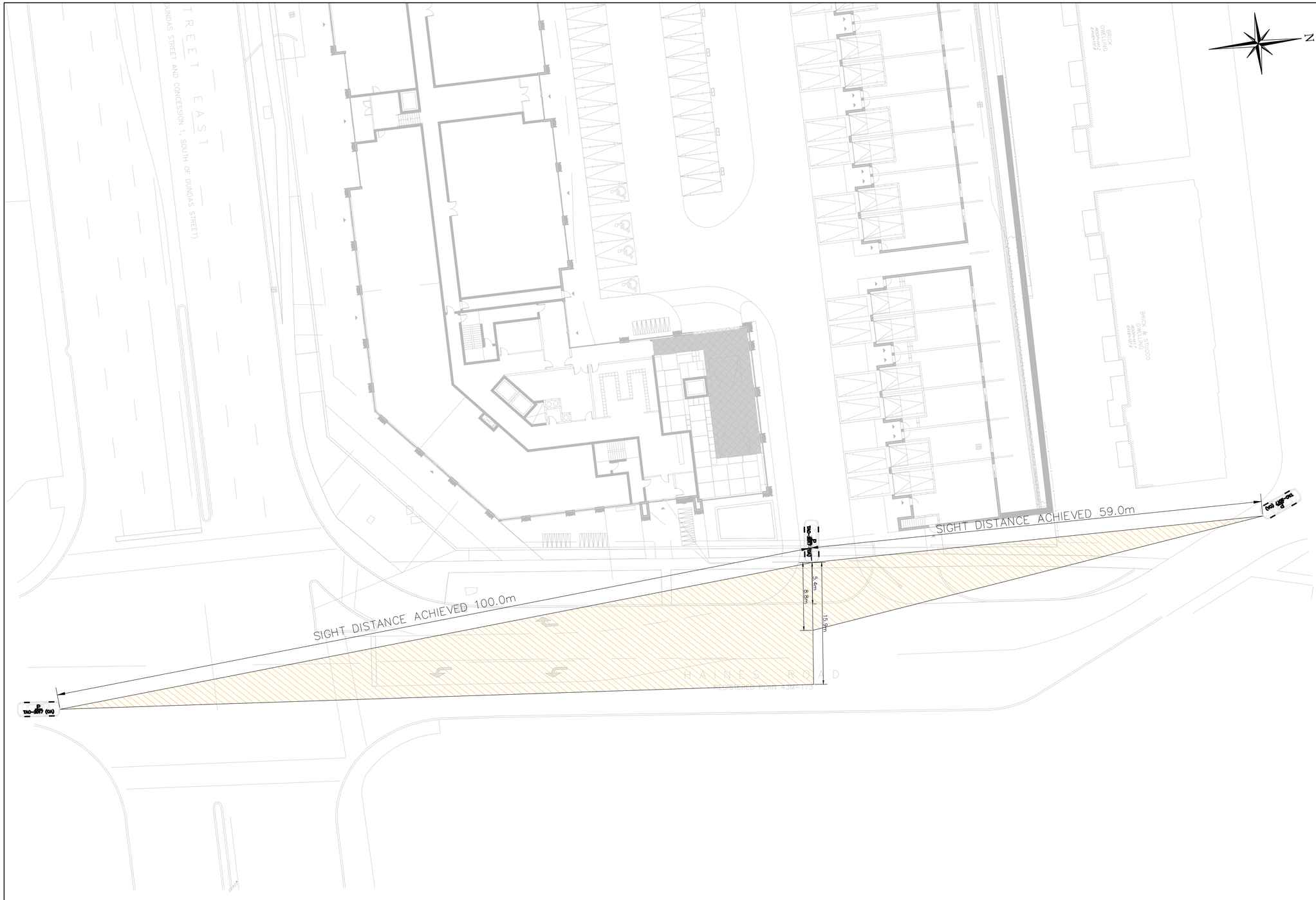
Note 1: Time gap for left-turning and right-turning vehicles from a stop onto a two-lane highway with no median and with a grade less than 3%. Value from Table 9.9.3 in the TAC-GDGCR.
Note 2: Sight distance values calculated from Intersection Sight Distance equation 9.9.1 in the GDGCR.

It is noted per above, that the sight lines to the proposed accesses do not technically meet the TAC requirements, the sight lines are adequate as vehicles positioned at the site access can see vehicles positioned at the stop sign right of the access (along Haines Road) as well as at the northbound approach at the intersection of Dundas Street East and Haines Road (to the right of the site access).

It is noted that the tree canopy along Haines Road may obstruct sight lines during summer months, and as such, is recommended to be trimmed to provide better visibility. Vehicles may alternatively stop slightly beyond the stop line to have better visibility of the adjacent intersections.

Considering the above, the proposed site access provides sufficient visibility for exiting drivers.

Figure SL-01 illustrates the sight lines at the site.



FOR REVIEW

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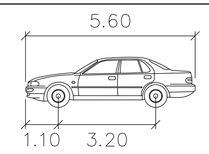

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Steering Angle	: 35.9

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SIGHT DISTANCE ANALYSIS
SIGHT ACCESS ON HAINES ROAD

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F.C.	A.W.	N.T.S.	SL - 01

8.2 Corner Clearance

Corner clearance is the distance between an access and the nearest upstream or downstream intersection and is measured from the near curb to near edge of the access to the up or downstream intersection. Figure 8.8.2 of the TAC GDGCR provides recommended minimum corner clearances for accesses to avoid difficult movements, blocking of the access, slow moving vehicles, and other safety or operational issues. The recommended minimum corner clearance between an access and a signalized intersection along an undivided collector road per Figure 8.8.2 is 55 meters. The proposed access provides a corner clearance of approximately 63 meters to the signalized approach at Dundas Street East at Haines Road, which sufficiently meets this minimum requirement.

9.0 Vehicle Maneuvering Assessment

A maneuvering assessment was conducted to ensure the proposed site design provides adequate space for the design vehicles expected at the site. The maneuvers of these design vehicles are elaborated upon in the following section.

9.1 Passenger Vehicles

Maneuvering assessments were undertaken for passenger vehicles (P-TAC 2017) to ensure passenger vehicles can ingress and egress critical parking spaces throughout the site. The vehicle maneuvering assessments illustrated in **Figures T300**, **T301**, **T302**, **T303** and **T304**. The Vehicle Turning Diagrams outline that passenger vehicles can maneuver straight through drive aisles and parking ramps simultaneously. In addition, all parking spaces can be maneuvered with no expected conflicts or encroachments.

Consistent with typical parking garages in the City of Mississauga and urban environments, vehicles are expected to yield to oncoming vehicles at corners of the drive aisle. Stop signs and convex mirrors are recommended throughout the underground parking levels to reduce potential conflicts and maximize visibility of oncoming vehicles.

9.2 Medium Single Unit Trucks

A maneuvering assessment for a Medium Single Unit (MSU) truck was conducted for the site, to ensure this design vehicle can successfully enter and exit the proposed site access and enter and exit the loading space on-site. As shown in **Figure T305**, a MSU truck can circulate the site without any expected conflicts or encroachments.

9.3 Waste Vehicle

A maneuvering assessment for the standard Region of Peel front end waste collection vehicle was conducted for the site, to ensure this design vehicle can successfully enter and exit the proposed site access and enter and exit the loading space on-site. As shown in **Figure T306**, the waste vehicle can circulate the site without any expected conflicts or encroachments.

It is noted that there are potential safety concerns at the proposed waste collection point due to garbage trucks reversing out of the loading area. As such a vehicle warning system as well as convex mirrors are proposed at the loading entrance to visually alert smaller vehicles of egressing trucks. The vehicle warning system will include signs warning motorists to be alert for trucks exiting the loading space. In addition, warning lights, mounted on the sign, will illuminate when the loading space is in use.

9.4 Emergency Vehicles

A maneuvering assessment was conducted for a standard Region of Peel fire truck to ensure that emergency services can access the site. As shown in **Figure T307**, the fire truck can enter and exit the townhouse frontage via the site access without any expected conflicts or encroachments. It is noted that fire trucks would be able to access the high-rise building via the frontages along Dundas Street and Haines Road.

9.5 Reduced Drive Aisle Width (NEW)

It is noted that the City of Mississauga Zoning By-Law requires a minimum drive aisle width of 7.0 metres. The Subject Development proposes a reduced drive aisle width of 6.8 metres within the underground parking facilities. Nevertheless, it is noted that the Vehicle Turning Diagrams show that passenger vehicles can safely maneuver around the site without conflict.

Furthermore, a drive aisle width of 6.8 metres is not uncommon within the GTHA. The City of Vaughan and City of Toronto for example, require a drive aisle width of 6.0 metres. Accordingly, the reduced drive aisle width of 6.8 metres is supportable.

9.6 Summary (UPDATED)

Considering the maneuvering analysis contained herein, as well as the proposed vehicle warning system, the Proposed Development is supportable from a vehicle maneuverability perspective.

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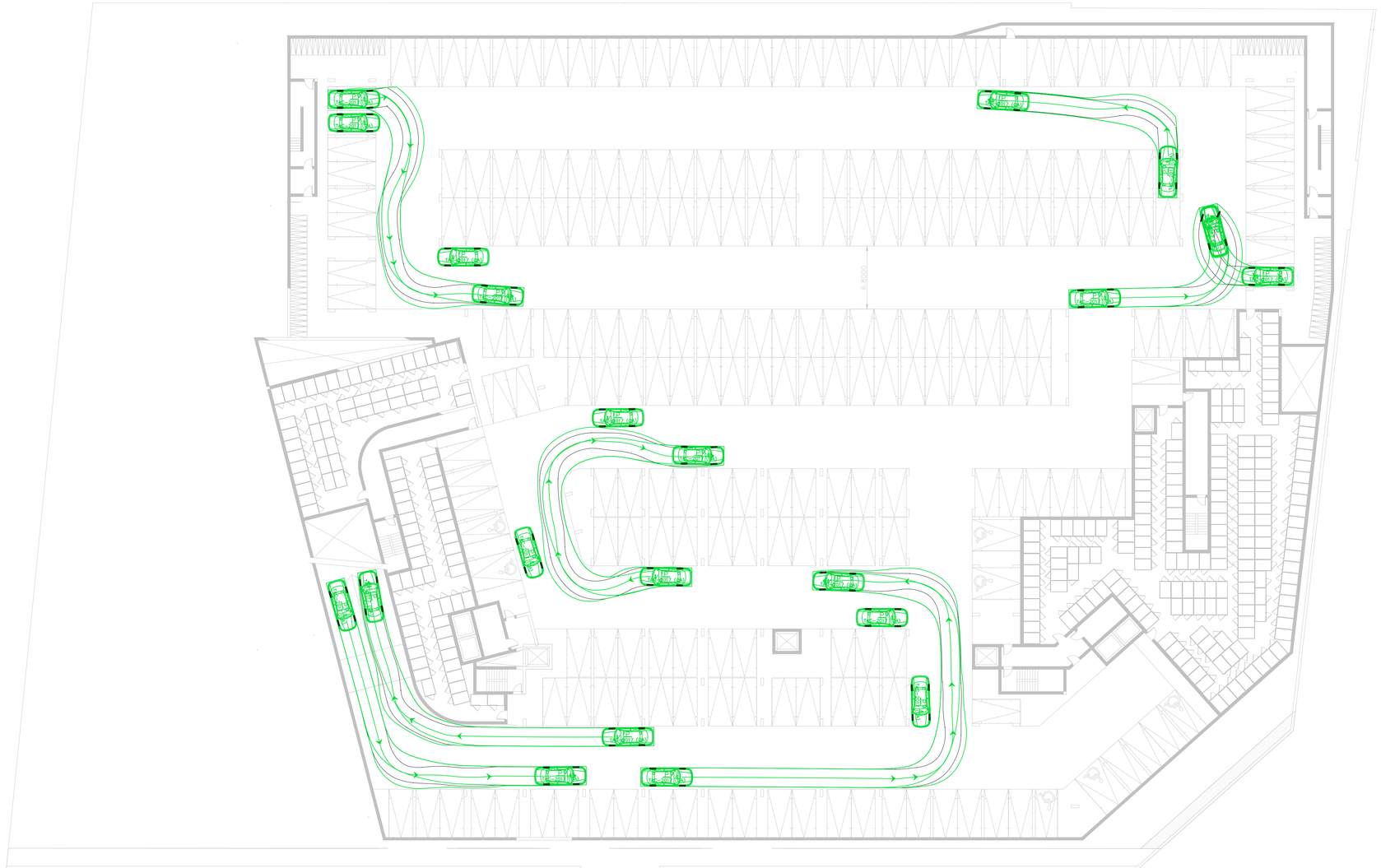

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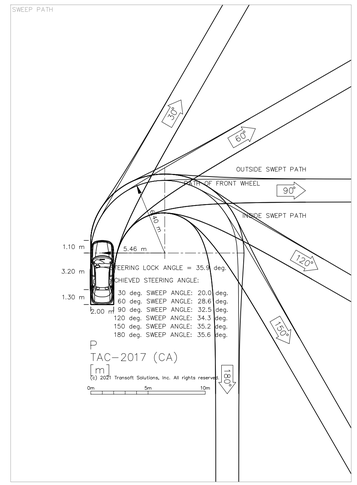

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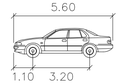

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No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR SUBMISSION	09/15/2022
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Project

805 DUNDAS STREET EAST
CITY OF MISSISSAUGA

Drawing

P2 UNDERGROUND
PASSENGER VEHICLE
VEHICLE MANEUVERING ANALYSIS

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Check By	M.Y	Check By	M.C.	Scale	1:250
				Drawing	T300

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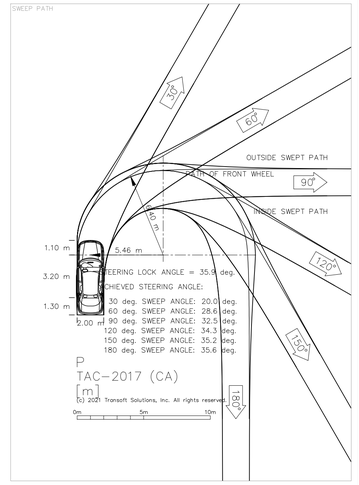
SWEEP PATH



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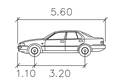
VEHICLE PROFILE



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P2 UNDERGROUND
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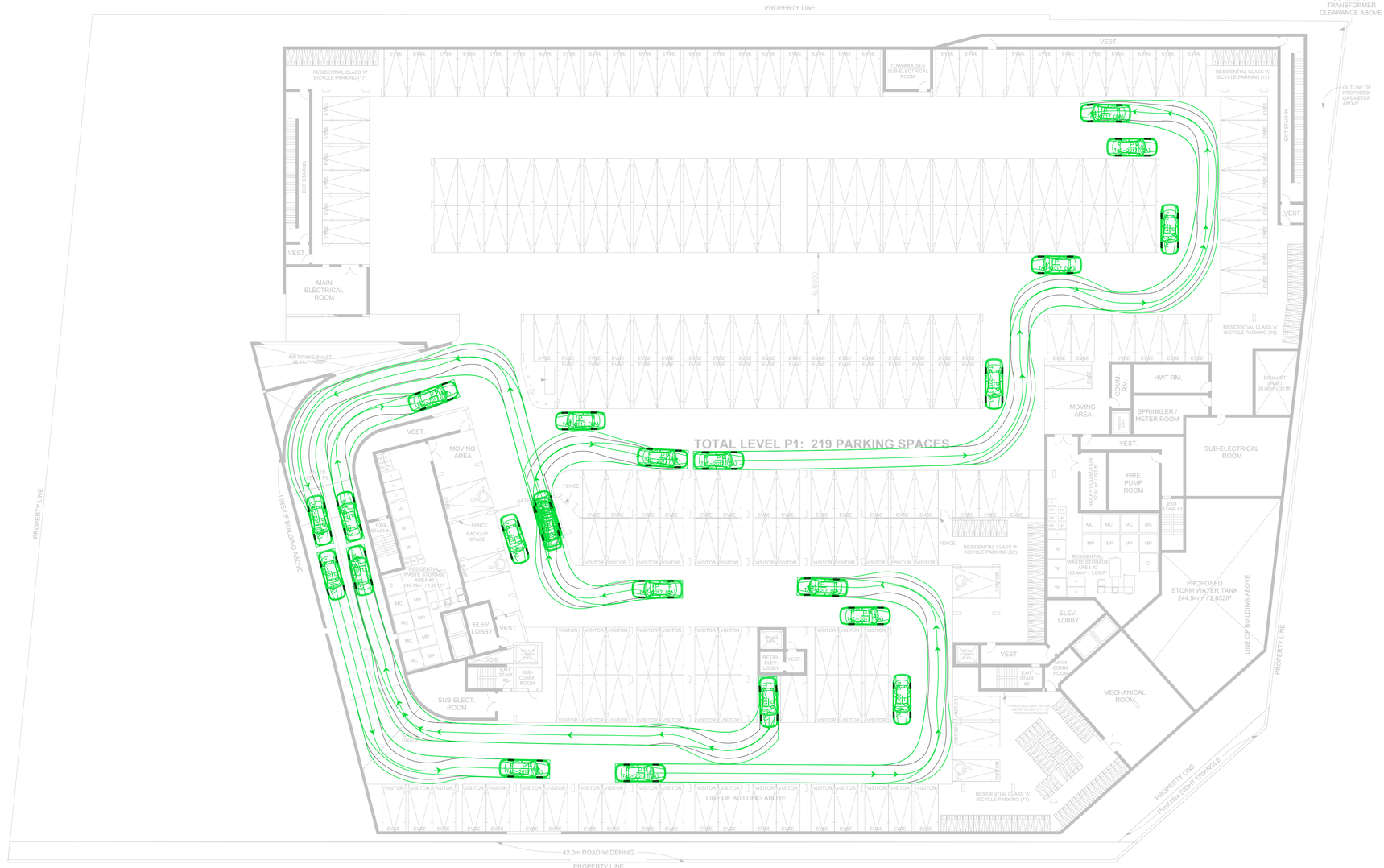

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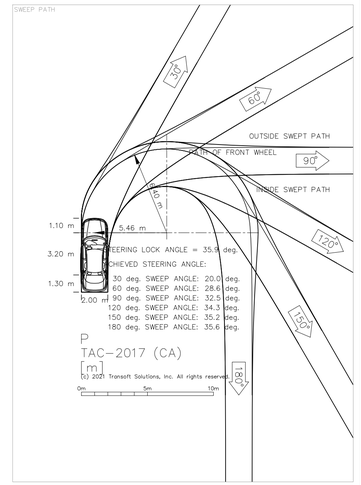

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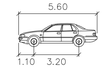

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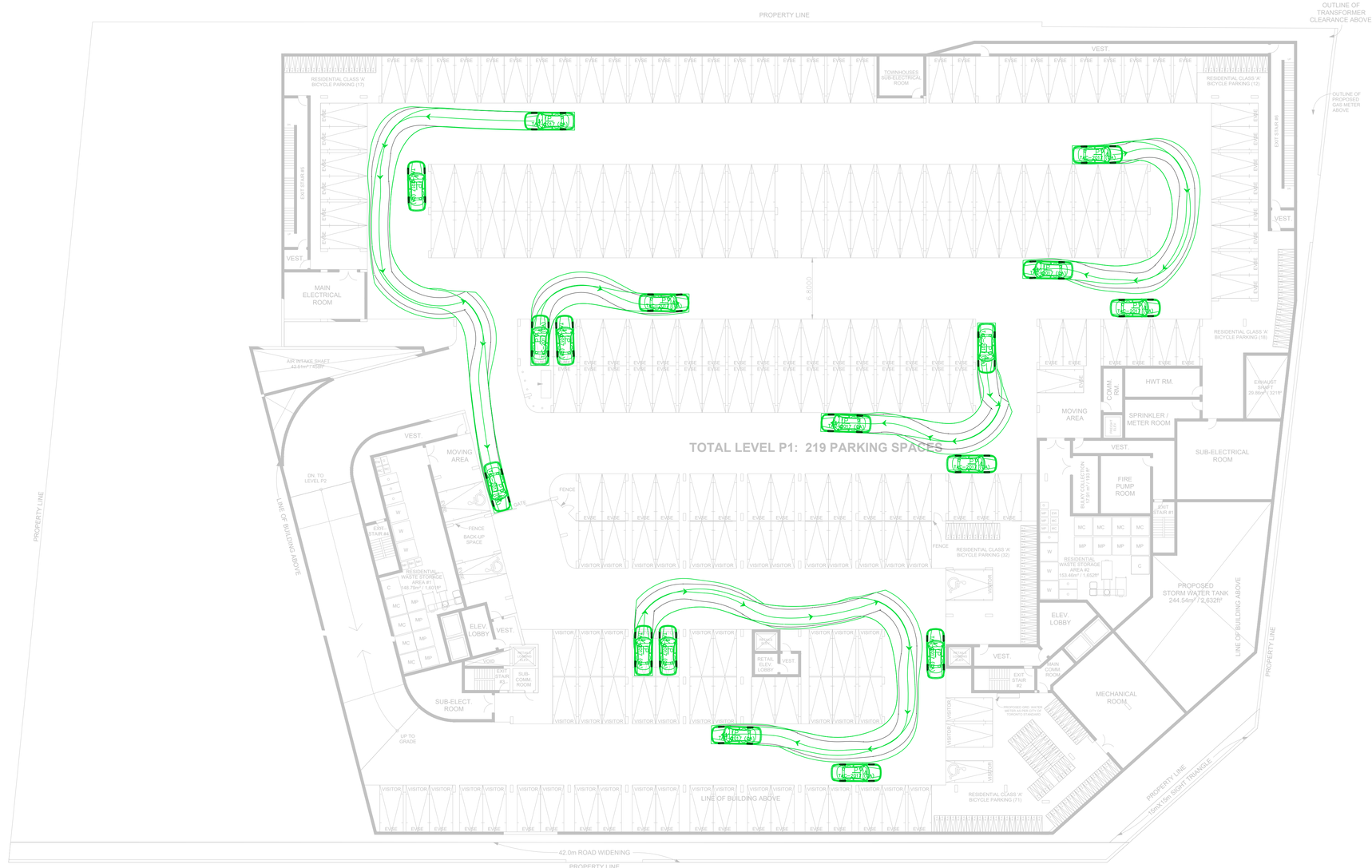

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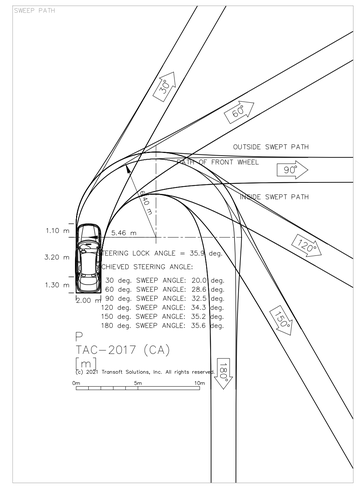

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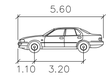

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No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR SUBMISSION	09/15/2022
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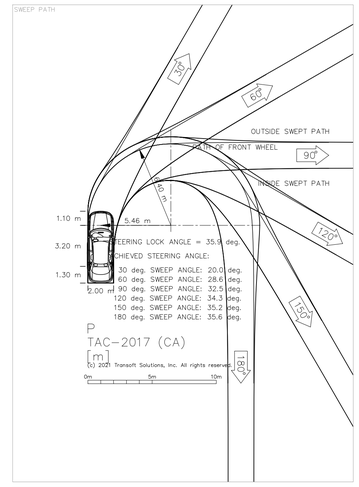

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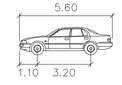

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GROUND FLOOR
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				Drawing	T304

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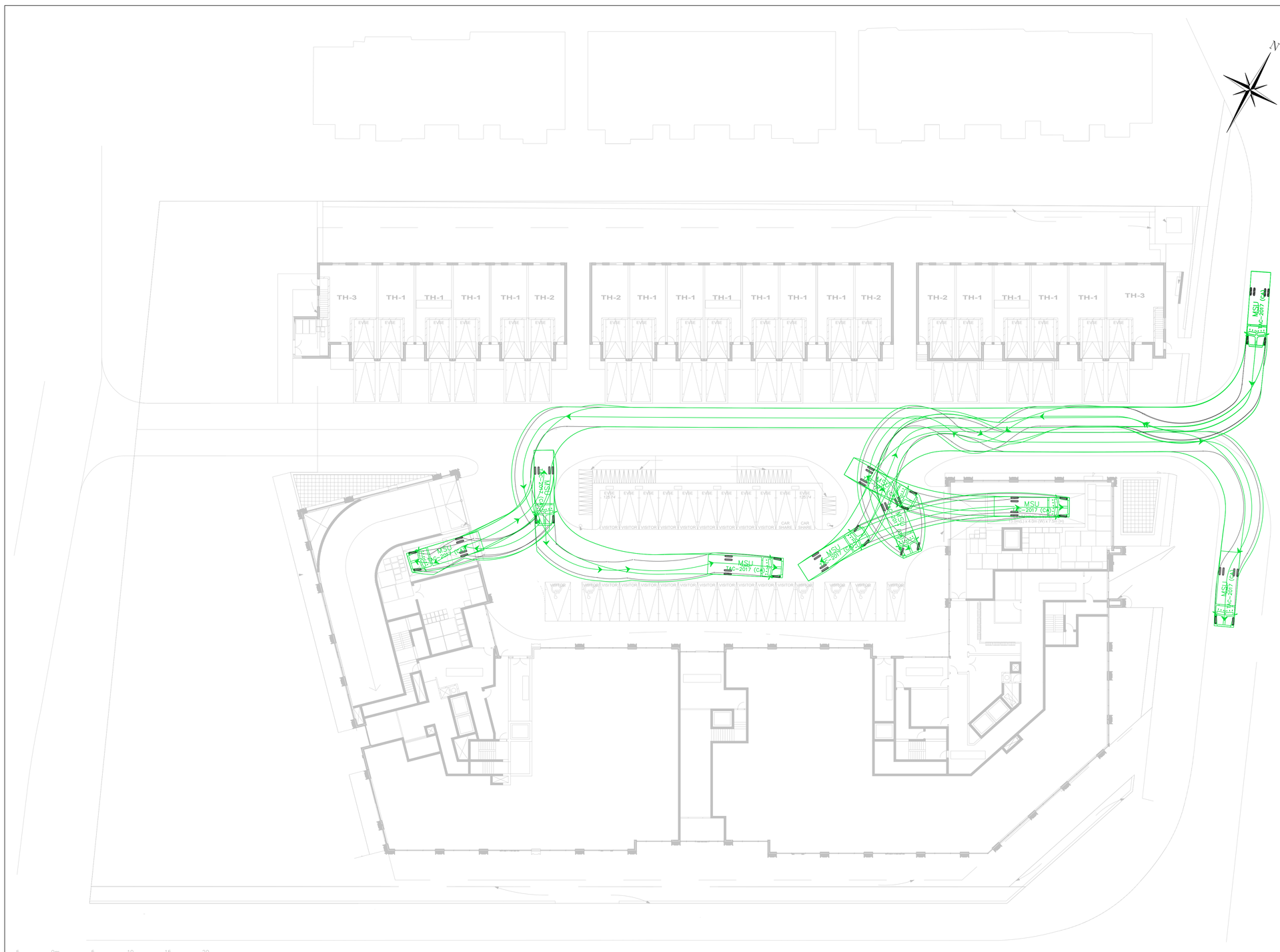

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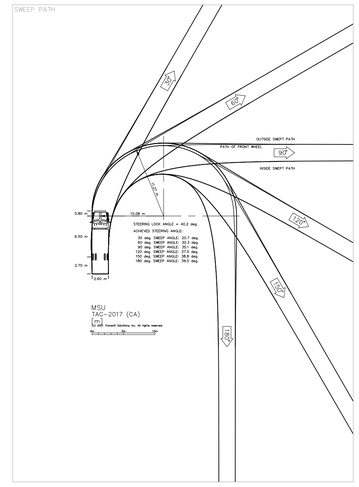

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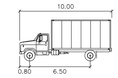

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No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR SUBMISSION	09/15/2022
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Check By	Check By	Scale	Drawing
M.Y	M.C.	1:250	T305

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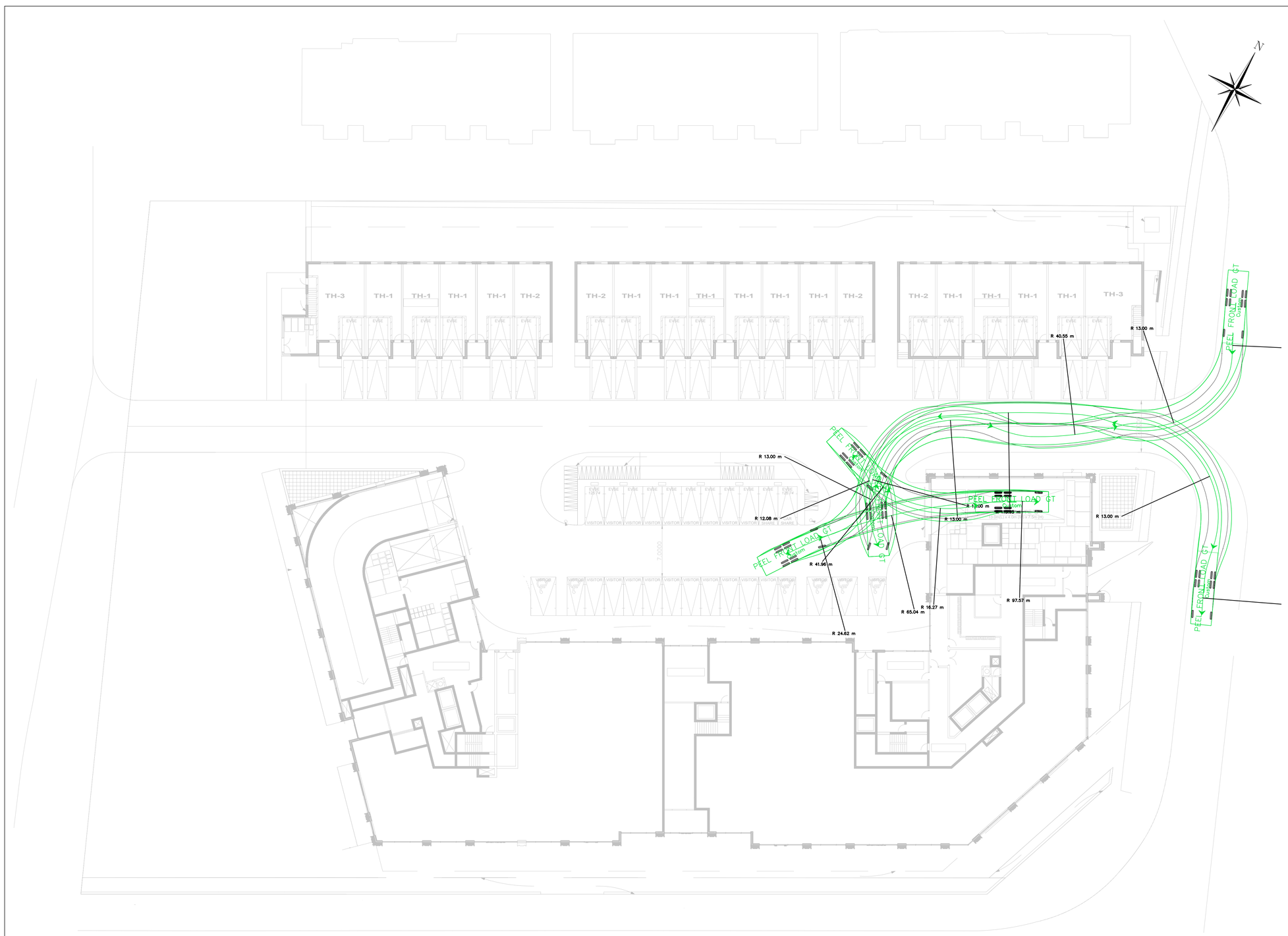

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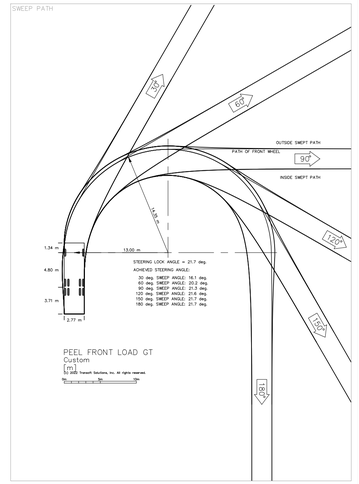

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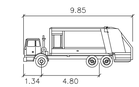

PEEL FRONT LOAD GT

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No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR SUBMISSION	09/15/2022
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Project
805 DUNDAS STREET EAST
CITY OF MISSISSAUGA

Drawing
GROUND FLOOR
GARBAGE TRUCK
VEHICLE MANEUVERING ANALYSIS

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Check By	M.Y	Check By	M.C.	Scale	1:250
				Drawing	T306

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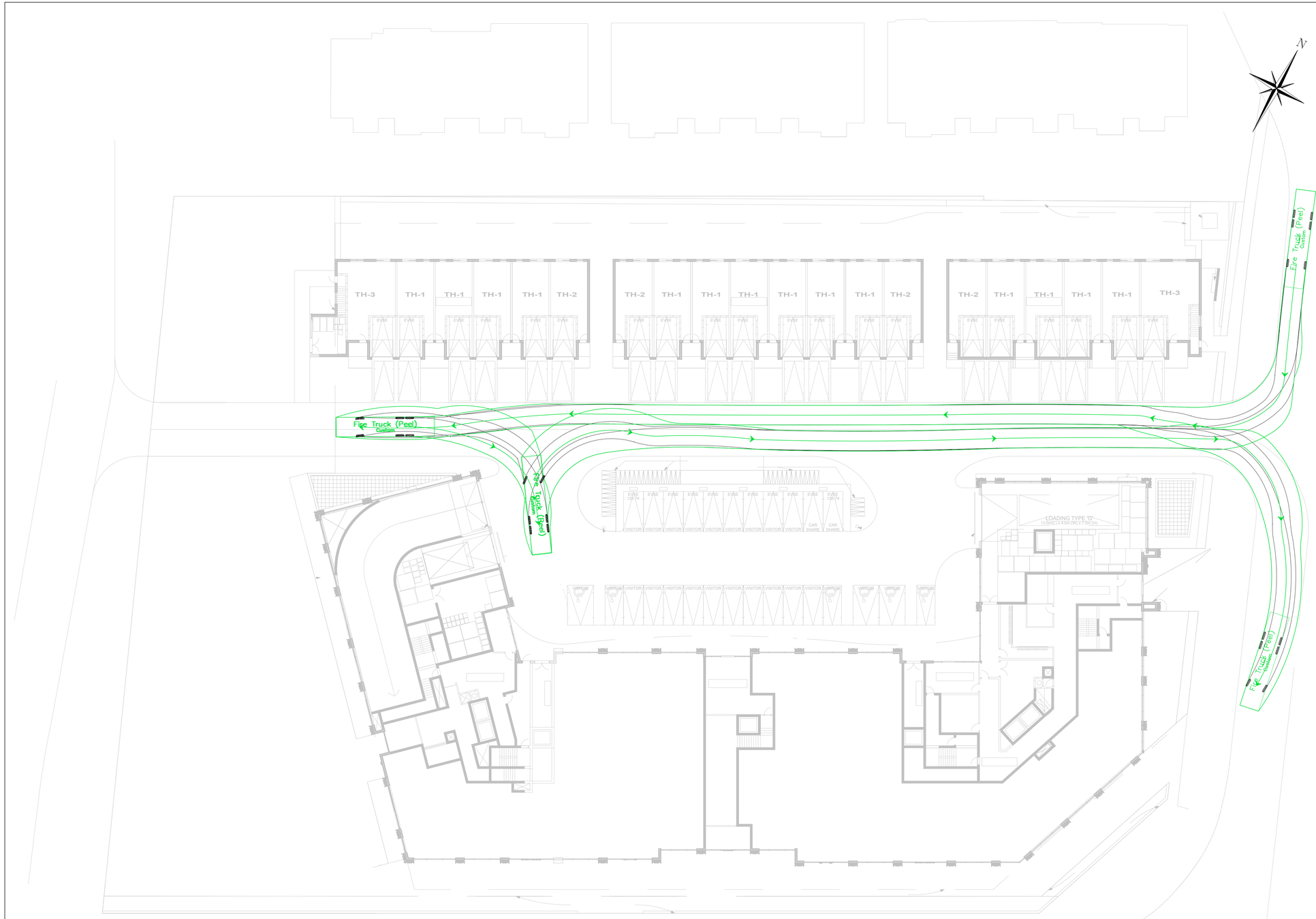

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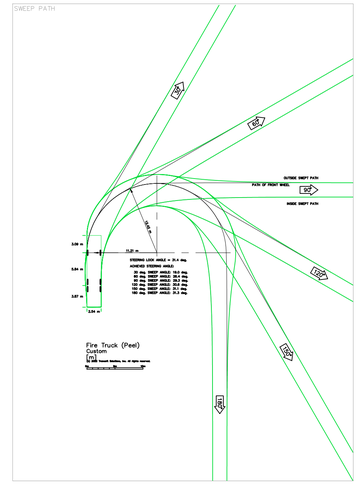

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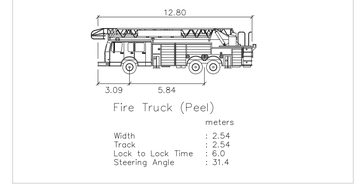

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1	ISSUED FOR SUBMISSION	09/15/2022
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Project

805 DUNDAS STREET EAST
CITY OF MISSISSAUGA

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GROUND FLOOR
FIRE TRUCK
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Drawn By	B.L	Design By		Project	2297–6402
Check By	M.Y	Check By	M.C.	Scale	1: 250
				Drawing	**T307**

10.0 Parking Review

10.1 Vehicle Parking Requirements (UPDATED)

At the time of the first submission, the City of Mississauga was in the process of updating the parking requirements and a Draft Zoning By-Law had been prepared. In June 2022, the City of adopted Zoning By-Law Amendment 0117-2022. Zoning By-Law Amendment 0117-2022 amended Zoning By-Law 0225-2007 with updated parking requirements that reflect the changing trends associated with parking across the GTHA, particularly in communities expected to benefit from significant transit improvement.

It is noted that per Zoning By-Law 0225-2007 Section 3.1.2.4, a shared arrangement is permitted for residential visitor and non-residential parking, which requires the greater of the visitor parking rate for the non-residential parking rate, as applicable, be provided at the development.

Additionally, it is noted that the non-residential parking rate calculated was assumed based on the "Retail Center" rate to provide the most appropriate estimate of the parking required at the proposed non-residential space.

The parking requirements per City of Mississauga Zoning By-Law 0225-2007 are outlined in **Table 13**. The Subject Site is located in Precinct 3.

Table 13: City of Mississauga Zoning By-Law 0225-2007 Minimum Parking Requirements

Type	Land Use	Units	Parking Rate	Required Parking	Proposed Parking
Residential (Residents)	Condominium Apartment	399 units	1.0 space per unit	399 spaces	401 spaces[1] (+2 spaces)
	Condominium Townhouse	20 units	2.0 spaces per unit	40 spaces	40 spaces (+0 spaces)
Residential (Visitors)[2]	Condominium Apartment	399 units	0.2 spaces per unit	80 spaces	85 spaces (+0 spaces)
	Condominium Townhouse	20 units	0.25 spaces per unit	5 spaces	
Retail[2,3]		2,000 m^2	3.5 spaces per 100 m^2	70 spaces	
Total				**524 spaces**	**526 spaces (+2 spaces)**

Note 1: The 401 proposed residential apartment parking spaces include two (2) carshare spaces at grade.
Note 2: As the residential visitors and retail parking are to be shared, the minimum parking requirements is the greater of the requirements for the two land uses.
Note 3: Retail gross floor area includes retail common/service area. A 5% reduction was applied as outlined in Zoning By-Law 0225-2007 Section 3.1.1.9.

As outlined above, the proposed parking supply of 526 spaces exceeds the City of Mississauga Zoning By-Law requirements of 524 spaces.

Appendix N contains relevant City of Mississauga Zoning By-Law excerpts.

10.2 Accessible Parking Requirements (NEW)

The parking requirements per the amended City of Mississauga Zoning By-Law 0225-2007 are outlined in **Table 14** below.

Table 14: City of Mississauga Zoning By-Law 0225-2007 Minimum Accessible Parking Requirements

Type	Required Vehicle Parking	Parking Rate	Required Parking	Proposed Parking
Residential (Visitors)	85 spaces	4% of required spaces	3 spaces	17 spaces
Retail	70 spaces	4% of required spaces	3 spaces	
Total			**6 spaces**	**17 spaces (+11 spaces)**

As outlined in 85 residential visitor spaces and 70 retail spaces are required, a minimum of 6 barrier free parking spaces are required. As 17 barrier free parking spaces are provided, the proposed accessible parking supply exceeds the City of Mississauga's Zoning By-Law requirements.

Appendix N contains relevant City of Mississauga Zoning By-Law excerpts.

10.3 Electric Vehicle Ready Parking Requirements (NEW)

The recently amended City of Mississauga Zoning By-Law 0225-2007 outlines the minimum electric vehicle (EV) ready parking space requirements. The minimum EV ready parking requirements are outlined in **Table 15**.

Table 15: City of Mississauga Zoning By-Law 0225-2007 Minimum EV Ready Parking Requirements

Type	Land Use	Required Vehicle Parking	Parking Rate	Required Parking	Proposed Parking
Residential (Residents)	Condominium Apartment	399 spaces	20% of required spaces	80 spaces	395 spaces
	Condominium Townhouse	40 spaces	1.0 of required spaces	40 spaces	
Residential (Visitors)	Condominium Apartment	80 spaces	10% of required spaces	8 spaces	
	Condominium Townhouse	5 spaces	-	-	
Retail[1]		70 spaces	10% of required spaces	7 spaces	
Total EV Ready Parking Spaces				**135 spaces**	**395 spaces (+260 spaces)**
Total EV Parking Spaces				**-**	**395 spaces**

Note 1: Retail gross floor area includes retail common/service area. A 5% reduction was applied as outlined in Zoning By-Law 0225-2007 Section 3.1.1.9.

The proposed development is required to provide 135 EV ready parking spaces. As 395 parking spaces are EV spaces are proposed, the development exceeds the minimum requirements.

Appendix N contains relevant City of Mississauga Zoning By-Law excerpts.

10.4 Bicycle Parking Requirements (NEW)

The recently amended City of Mississauga Zoning By-Law 0225-2007 instituted minimum bicycle parking rates. The minimum bicycle parking requirements are outlined below in **Table 16**.

Table 16: City of Mississauga Zoning By-Law 0225-2007 Minimum Bicycle Parking Requirements

Land Use	Parking Type	Units	Parking Rate	Required Parking Supply	Proposed Parking Supply
Condominium Apartment	Bicycle (Class A)	399 units	0.60 space per unit	293 spaces	293 spaces (+0 spaces)
	Bicycle (Class B)		0.05 space per unit	20 spaces	20 spaces (+0 space)
Condominium Townhouse	Bicycle (Class A)	20 units	-	-	-
	Bicycle (Class B)		-	-	-
Retail	Bicycle (Class A)	2,000 m^2	0.15 space per 100m^2	3 spaces	3 spaces (+0 space)
	Bicycle (Class B)		0.20 space per 100m^2	4 spaces	4 spaces (+0 space)
Total				**266 spaces**	**266 spaces (+0 spaces)**

As outlined in **Table 16**, to support the Proposed Development, a total of 266 bicycle parking spaces are required. As 266 bicycle parking spaces are proposed, the minimum bicycle parking requirements are satisfied.

Appendix N contains relevant City of Mississauga Zoning By-Law excerpts.

11.0 Transportation Demand Management (TDM)

Transportation Demand Management (TDM) measures are recommended to promote alternative modes of transportation, such as transit, cycling or walking, and reduce single-occupant vehicle (SOV) trips entering and exiting the Proposed Development.

11.1 Existing TDM Measures

11.1.1 Modal Split

TTS data was used to determine the modal split expected at the Proposed Development. The modal split was determined by filtering for the mode of trips at the subject GTA Zone 3669, as well as neighboring zones 3674, 3673, 3668, and 3670 with similar residential and non-residential characteristics. A summary of the modal split analysis is provided in Table 17. The detailed TTS query is provided in **Appendix O**.

Note, other modes of transportation such as cycling, rideshare and taxi passengers comprised less than 1% of the modal split in the study area, and were consequently omitted in the results below.

Table 17: Modal Split

Mode of Travel	Modal Split
Auto	79%
Transit	13%
Walking	7%

As indicated above, there is a sizeable portion of commuters in the area who would be using local and regional transit. Additionally, as sidewalks are readily available in the area, the modal split of walking residents and visitors to the area indicates the study area is highly walkable.

It is expected that TDM measures at the site would be effective at the site given the existing infrastructure to support non-auto trips.

11.1.2 Transit

As outlined previously in **Section 3.3**, local transit routes offer connectivity in the east-west direction along Dundas Street, and in the north-south direction along Tomken Road, and regional transit is available via a short transit ride to the Dixie GO Station.

The existing transit stops at Dundas Street East and Haines Road have transit shelters; thus, additional infrastructural improvements are not necessary.

It is noted that as of March 2022, Metrolinx has instituted a co-fare discount, which allows GO Rail passengers to transfer to and from MiWay Transit without paying the additional MiWay fare.

11.1.3 Active Transportation

As referenced to previously in **Section 3.1**, the site area is highly walkable with sidewalks available on all the surrounding roadways. Pedestrian signals are also available at the intersection of Haines Road and Dundas Street East, providing additional safety to crossing pedestrians from the site.

It is noted that there are no cyclist facilities in the immediate study network (along Dundas Street East or Haines Road). However, east-west cyclist connectivity is available via multi-use paths along Queensway East and north-west connectivity along Dixie Road for cyclists not wishing to share the road with vehicles.

11.2 Future TDM Measures

11.2.1 Pedestrian Facilities

Existing pedestrian connections on Haines Road will connect to the proposed site via the site access. These paths should be well-lit to be safe and appealing to residents and visitors. Furthermore, pedestrian refuges, such as benches or fixtures, may be provided for transit users, as well as refuge for walking residents.

11.2.2 Transit Facilities

The use of transit is generally supported by providing sufficient pedestrian connectivity from the site to the existing sidewalk on Haines Road/Dundas Street East as mentioned above, which provides a convenient means of accessing the existing local transit stops located within a short walking distance of the site.

The planned Dundas BRT is geared towards reducing automobile dependency and maximizing sustainable mode (transit and active transportation) mode share. The proposed Tomken Road and Cawthra Road BRT stops are within 500 metres of the Subject Development, providing convenient transit accessibility to the development's residents and visitors.

11.3 Site Specific TDM Measures

There are several opportunities for the development to promote TDM measures at the Site Plan level in support of reduced automobile use. The following recommendations are expected to contribute to reduced automobile use and increased sustainable mode share:

- TDM Information Package
- Wayfinding Signage
- Pre-Loaded PRESTO Cards
- Bicycle Repair Station
- Provision of Carshare Spaces
- Unbundled Parking
- Smart Commute

11.3.1 TDM Information Package

Various educational measures and incentives may be promoted at the new residential site to build an overall robust TDM brand and promote use of alternative modes of transportation available to residents.

The residential units being sold at the Subject Site should be promoted with a strong TDM brand, where marketing should highlight the convenience of proximity to nearby bus stops and amenities.

Education on available transit in the vicinity of the Subject Site would also be highly effective in promoting transit to new residents, who may not be aware of the variety of options available in the area. Handouts on local transit offerings and stop/schedule information, as well as nearby cyclist and pedestrian routes, may be provided to residents as part of a welcome package, and extra copies should be made available in the lobby for reference.

11.3.2 Wayfinding Signage

Fixtures such as kiosks or displays may be provided in the building lobby to inform residents of transit information, such as routes, schedules, and stop locations of nearby bus routes. Additionally, brochures outlining nearby transit nodes, bicycle routes, and pedestrian routes should be made available in the lobby. Additional wayfinding signage to lead residents to nearby bus stops along

Dundas Street East and Haines Road may also be provided on the premises to promote the use of local and regional transit options.

11.3.3 Pre-Loaded PRESTO Cards

It is recommended that one-time pre-loaded PRESTO cards should be provided to all new residents to encourage the use of MiWay and GO Transit. The pre-loaded PRESTO cards can be valued between $50 to $100 per unit.

11.3.4 Bicycle Repair Station (NEW)

A compact bicycle repair station with a toolkit and pump is recommended. The station can be provided near bicycle parking spaces to promote cycling use. The station also increases 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.

11.3.5 Provision of Carshare Spaces (NEW)

The most recent Site Plan proposes two (2) carshare spaces, which are to be publicly accessible and located at grade. Those who do not require a vehicle frequently, may utilize the carshare on an as needed basis, reducing the overall parking demand of the site.

Carshare marketing material should be included in the TDM information package for new and existing tenants, if applicable.

11.3.6 Unbundled Parking (NEW)

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 owners should be advised in advance of the parking availability and cost of purchasing a parking space, if available. As such, the residential parking demand can be controlled. By advising the parking availability to potential tenants prior to the 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 GO stations and bus stops, including the future Dundas BRT stops.

11.3.7 Smart Commute

Smart Commute is a non-profit Transportation Management Association (TMA) committed to reducing traffic congestion, improving air quality, and acting on climate change. Smart Commute Peel operates in Mississauga and the Brampton-Caledon area, including the Subject Site. Smart Commute works with many businesses in the City of Mississauga by providing resources and tools which allow commuters to consider transportation alternatives.

More specifically, the following Transportation Demand Strategies are provided by Smart Commute and have been historically shown to reduce single-occupant vehicle (SOV) trips to and from workplaces. Employers at the ground-floor non-residential spaces may work with Smart Commute to take advantage of the following programs:

- Carpooling: Smart Commute promotes carpooling to employees as a viable mode choice. A new online tool called "SmartTripsON" is in the works, which will help commuters find and share carpool trips, and aid in trip planning. Employers can also set up their networks to assist their staff in finding carpool partners. Additionally, Smart Commute highlights carpooling benefits, such as cost savings, benefits to the environment, and stress reduction.

- Cycling and Walking: Smart Commute encourages increased walking and cycling by offering an online tool where users can set goals and track active commuting habits and calories burned. Smart Commute facilitates employee engagement events, where employees can also earn rewards for walking and cycling to work.

- Awareness and Education: Smart Commute helps employees develop an action plan to use alternative modes of transportation and offers access to various resources and studies relating to the benefits of carpooling, transit, and active transportation.

- Emergency Ride Home: Smart Commute is aware that when employees walk, cycle, take transit or carpool on a regular basis, the need for an unexpected trip may arise in the middle of the day, outside a scheduled plan for commuting. The Emergency Ride Home program reimburses employees making an emergency trip home in unexpected circumstances if they regularly use sustainable modes of commuting.

Smart Commute also promotes initiatives such as flexible working hours and telework. However, given the Proposed Development's non-residential space, employees would likely be expected to work on-site. However, for office-focused roles, telework and flexible working hours may be an option.

The Smart Commute program is utilized region-wide by many employers and organizations and will reduce SOV trips generated by the Proposed Development.

11.4 Project Program Cost

The estimated cost to implement the TDM program components are outlined in **Table 18**. The estimated cost to administer the TDM plan would be $22,850.

Table 18: Travel Demand Management Plan Costs

TDM Measure	Unit Price	Quantity / Number of	Product Cost
PRESTO Cards	$50	419	$20,850
TDM Information Package	$500	1	$500
Travel Survey	$500	1	$500
TDM Event	$1,000	1	$1,000
Total Cost			**$22,850**

12.0 Community Impacts (NEW)

A virtual community meeting was conducted by the City on Wednesday April 19, 2023, and no transportation related comments were received pertaining to the Subject Development. Community

impacts related to the increase of traffic have been addressed in this report. **Sections 6.2** and **7.0** summarize the traffic impact of the Proposed Development and recommended improvements, respectively.

13.0 Conclusions (UPDATED)

KJC Properties Inc. proposes a mixed-use residential commercial building with 399 apartment units and 2,374 m^2 of ground floor retail space as well as three (3) townhouse buildings with 20 units located at 805 Dundas Street East in the City of Mississauga.

The findings and recommendations of the analysis included herein are summarized as follows:

Existing Conditions

- Under 2022 existing traffic conditions, the study intersections operate with a Level of Service "C" or better, except for the intersection of Dundas Street East at Tomken Road which operates with an LOS "D" during the P.M. peak only.

- Some overcapacity movements were identified during existing conditions which may be attributed to the signal timing and traffic counts being mismatched due to the traffic counts' age.

Future Background Conditions

- The future background operations of the study intersections are similar to existing conditions, and all capacity concerns in the future horizon are consistent with poor movements observed in existing conditions.

- To address the transportation operational concerns expected during existing and future background conditions, signal optimization at Dundas Street East at Haines Road and Dundas Street East at Tomken Road is recommended.

- Signal optimization at Dundas Street East at Haines Road is recommended during the A.M. peak improves the delay at the intersection and slightly improves the capacity for the southbound left-turn; however, the southbound left-turn may operate critically even with optimization, thus the City can consider implementing a southbound left-turn advance phase to improve the operations of the southbound left-turn movement.

- Signal optimization at Dundas Street East at Tomken Road during both the A.M. and P.M. peak is recommended to mitigate existing capacity concerns, however it is noted that the eastbound left-turn movement may still operate critically during the P.M. peak. The capacity concerns at this intersection stem from existing capacity issues, therefore it is recommended the City monitor this intersection for improvements to improve operations as necessary.

Future Total Conditions

- The updated Site Plan features an unchanged number of residential units and a small increase in retail gross floor area (GFA) in comparison to the previous submission.

- Based on the review of the trip generation for the proposed retail space, the increased retail GFA is expected to result in +2 and +1 additional trips during the A.M. and P.M. peak hours, respectively. As such, the increase in trips is minimal and is not expected to impact the traffic operations. Thus, the traffic operational analysis was not updated herein.

- A review of the previously outlined trip generation (Crozier, September 2022) indicates that the Proposed Development is expected to generate 130 and 77 net two-way vehicle trips during the weekday A.M. and P.M. peak hour, respectively.

- The future total operations of the study intersections are forecasted to be very similar to that of future background conditions. As such, the Proposed Development is not expected to materially impact the operations of the surrounding intersections.

Summary of Recommended Improvements

Based on the operations outlined, **Table C1** summarizes the recommended improvements.

Table C1: Recommendation Summary

Horizon	Recommended Improvements	Responsibility
2027 Future Background	**Required** Signal Optimizations at: • Dundas Street East at Haines Road • Dundas Street East at Tomken Road	City
	Consider: • Implementing a southbound left-turn advance phase at Dundas Street East at Haines Road • Monitoring traffic volumes in the mid- to long-term future as well as Dundas BRT to determine if additional improvements are warranted	City
2027 Future Total	**Consider**: • Continuing to monitor traffic volumes in the mid- to long-term future as well as Dundas BRT to determine if additional improvements are warranted	City
Beyond 2027 Future Total	**Planned** Capital Improvements: • Dundas BRT	Metrolinx

Parking Review

- The proposed parking supply of 526 spaces exceeds the requirements outlined in the recently amended Zoning By-Law 0225-2007.

- The Proposed Development exceeds the accessible parking and electric vehicle ready parking requirements as outlined in Zoning By-Law 0225-2007.

- The proposed 266 bicycle parking spaces also meet the requirements outlined in Zoning By-Law 0225-2007.

Transportation Demand Management

- There are many existing and future TDM opportunities for the Subject Property. The following site-specific TDM measures are proposed:

    - TDM Information Package

- Wayfinding Signage
- Pre-Loaded PRESTO Cards
- Bicycle Repair Station
- Provision of Carshare Spaces
- Unbundled Parking
- Smart Commute

Other

- The proposed site access location can be supported as no operational concerns are expected, adequate sight lines are provided, and sufficient corner clearance is available to the adjacent major intersection.
- The maneuvering assessment conducted for the site concluded that all expected design vehicles on site (including passenger vehicles, waste vehicles, and emergency vehicles) can successfully maneuver throughout the site with no expected conflicts.

In consideration that the proposed site is not expected to significantly impact the study road intersections. Additionally, as the site maneuvering is expected to cause no conflicts and the location of the proposed site access is not expected to pose visibility or operational concerns, the Proposed Development is supportable from a transportation perspective.

The analysis contained within this report was prepared using information received from the proponent, as well as the most recent Site Plan. Any minor revisions to the Site Plan are not expected to affect the conclusions contained within this report. In conclusion, the Proposed Development can be supported from a transportation operations and safety perspective.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

Ian Lindley, MASc., P.Eng.
Project Engineer, Transportation

C.F. CROZIER & ASSOCIATES INC.

Aaron Wignall, Associate
Senior Project Manager, Transportation

C.F. CROZIER & ASSOCIATES INC.

My-Linh Yee, EIT
Engineering Intern, Transportation

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\\Crozier-Files\Projects\2200\2297- KJC Properties Inc\6402- 802 Dundas St E\Reports\Traffic\2023.06.09 Second Submission\2023.06.19 805 Dundas Street TIS and PJS Update.docx

APPENDIX A:

Correspondence

Farah Tasnim

From: Kate Vassilyev <Kate.Vassilyev@mississauga.ca>
Sent: Monday, May 30, 2022 12:16 PM
To: Farah Choudhury
Cc: Aaron Wignall; Ian Lindley; Ryan Au
Subject: RE: 802 Dundas Street Terms of Reference and Data Request (CFC 2297-6402)

Hi Farah,

I apologize for the delay. Thank you for providing the Terms of Reference for 802 Dundas St East. Staff have reviewed it and provided the following comments in blue. Please let me know if you have any additional questions.

Regards,

Kate (Jekaterina) Vassilyev
Traffic Planning Technologist
T 905-615-3200 ext.8171
kate.vassilyev@mississauga.ca

City of Mississauga | Transportation and Works Department,
Infrustructure Planning Division

Please consider the environment before printing.

From: Farah Choudhury <fchoudhury@cfcrozier.ca>
Sent: Monday, May 16, 2022 3:57 PM
To: Bo Yu <BoYang.Yu@mississauga.ca>; Tyler Xuereb <Tyler.Xuereb@mississauga.ca>; Jim Kartsomanis <Jim.Kartsomanis@mississauga.ca>
Cc: Aaron Wignall <awignall@cfcrozier.ca>; Ian Lindley <ilindley@cfcrozier.ca>
Subject: 802 Dundas Street Terms of Reference and Data Request (CFC 2297-6402)

Hello,

C.F. Crozier and Consulting Engineers (Crozier) has been retained to prepare a Transportation Impact Study (TIS) for a mixed-use residential/retail development located at 802 Dundas Street, City of Mississauga. The Site Plan for the proposed development are attached in this email for your review.

We are kindly requesting that you review the following Terms of Reference (ToR) and provide feedback regarding our scope of work and request for data. Furthermore, should you not be the appropriate person for correspondence, it would be very appreciated to be directed to the appropriate contact.

Study Methodology for the Transportation Impact Study

We will be conducting this study using the guidelines set out in the City of Mississauga TIS Guidelines.

The following intersections will be analyzed as part of the scope of study:

- Dundas Street at Haines Road
- Proposed Site Access at Haines Road
- Dundas St E & Cawthra Rd ramp

- Dundas St E & Tomken Rd

We kindly request recent traffic counts available to the City at the above noted intersections. Alternatively, we may consult specialty traffic counting firms we typically work with, in the event recent counts are not available. The historical AADT data, Growth Rate and Turning Movement Count can be obtained from Tyler Xuereb, Transportation Planning Analyst (tyler.xuereb@mississauga.ca, Ext. 4783). Please be advised that City of Mississauga still is not accepting new traffic counts. In order to grow traffic volumes to existing 2022 levels, please obtain historical traffic data counts and utilize regression analysis to determine appropriate growth rates.

Additionally, we kindly request confirmation that the above noted intersections are sufficient for analysis. In the event that analysis of additional intersections is required, please also include the most recent traffic counts available at these intersection(s). Please see above.

Analysis Periods and Scenarios

The weekday A.M. and P.M. peak hours for the 2022 existing conditions, as well as a 5-year horizon year from the date of the TIS (2027) will be considered for future background and total traffic conditions, per the City's TIS Guidelines.

Background Developments

Please provide any background developments in the vicinity of the proposed development and the associated transportation impact studies that should be included in our analysis. 3111 & 3123 Cawthra Rd (SP 18-133).

Future Background Growth Rate

We will be assuming a 2% growth rate for through movements along Dundas Street, and no growth for all other movements. Please confirm with Tyler Xuereb, Transportation Planning Analyst (tyler.xuereb@mississauga.ca, Ext. 4783).

Please advise whether the assumed growth rate is sufficient, or alternatively please provide an appropriate growth rate(s) to reflect expected growth in the area.

Trip Generation and Distribution

Trip Generation for the proposed development will be based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The following Land Use Codes are proposed to be used:

- LUC 222 (Multifamily Housing High Rise) – for Building A Residential Units
- LUC 215 (Single Family Attached Housing) – For Buildings B, C, and D Residential Units
- LUC 820 (Shopping Center) – For Building A Retail Space

I have provided print-outs of the above noted land use codes from the Trip Generation Manual 11th Edition for your reference. Without any reductions, the development would be expected to generate 156 A.M. peak trips and 199 P.M. peak trips.

Additionally, we are looking to use the internal capture rates provided by NCHRP Project 8-51/ITE Journal "Improved Estimation of Internal Trip Capture for Mixed Use Developments" to reduce the site-generated trips for the mixed-uses proposed for Building A. See the attached worksheet for the calculations and rates. With the this trip reduction, we would expect a total of 153 A.M. peak hour trips and 169 P.M. peak hour trips to be generated at the development.

Please advise whether the above noted methodology to estimate the site-generated trips is acceptable. Acceptable.

Roadway and Transit Improvements

Please advise as to whether there are any roadway and transit improvements planned within the vicinity of the proposed redevelopment. Please follow the link: **http://www.mississauga.ca/portal/residents/roadresurfacing**

Dundas Connects MP **https://www.mississauga.ca/wp-content/uploads/2020/08/24113357/20180524_Dundas_Connects_Master_Plan_WEB.pdf**

Analysis Procedures

Weekday A.M. and P.M. peak hours will be analyzed using Synchro 11.0 analysis software, using Highway Capacity Manual (HCM) methodology. Please include all Synchro reports in the Appendix.

Site Access Review

The location of the site access will be reviewed using TAC and Peel Region guidelines, and sight distance from the proposed access will be analyzed using the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads. Agreed.

Transportation Demand Management (TDM) Opportunities

Analysis of existing and future Transportation Demand Management (TDM) opportunities will be conducted to reduce single-occupant vehicle (SOV) trips and promote alternative modes of transportation including transit and active transportation.

We request the following information for inclusion in the study, along with any comments that arise with regards to the above Terms of Reference.

- Please provide the most recent traffic counts available for the intersections of study. Please refer to the above for the comments.
- Please provide relevant growth rate(s) applicable to the roadways of study.
- Please provide any relevant background developments and the associated traffic impact studies that are to be included our analysis.
- Please provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years.

I hope the contents outlined in this email are acceptable. Should you have any questions or require any further information, please feel free to contact me.

The TIS shall include a section in the report to address Community Impacts. This section shall include summary statements outlining the resulting traffic increases to the critical streets, movements and intersections. Comments or concerns from the community through future public meetings and engagements that are related to traffic shall also be addressed in this section.

Kind regards,

Farah Choudhury

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

Crozier Connections:

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Department/Agency	Comment	Status/Response
Transportation & Works, Parking Paulina Szmudrowska paulina.szmudrowska2@mississauga.ca 905.615.3200 ext. 2692	The applicant is advised that the stipulated/calculated visitor parking rates are incorrect within Table 11: Draft Zoning By-law Parking Review for Residential Units as may be found on page 35 of the submitted Transportation Impact Study. Condominium apartment and condominium townhouse uses vary in parking rates. Please revise the chart to reflect the provisions from the City's amended Zoning By-law 0225-2007.	Noted. **Section 10.1** has been updated to reflect the City's amended Zoning By-Law 0225-2007.
	Please be advised, industry standard ITE parking data is not satisfactory and shall not be considered as part of the justification for the parking deficiency proposed onsite.	Noted. ITE parking data has been removed as a parking justification.
	The applicant did not submit a satisfactory Parking Justification Letter (PJL) that complies with the City's parking Terms of Reference (TofR).	Noted. The proposed parking supply exceeds the Zoning By-Law requirements. As such, parking justifications have not been included herein.
	Staff commend the Applicant for considering the provision of TDM measures on-site. Municipal Parking Staff advise that the Applicant contact TDM Staff in the Transportation Planning section (tdm@mississauga.ca) if additional information is required in regards to TDM strategies.	Noted. The proposed TDM measures for the Subject Site have been shared with TDM staff in Transportation Planning.
Transportation & Works, Traffic Review Kate Vassilyev kate.vassilyev@mississauga.ca	Please include Certification Form found at Appendix A, City of Mississauga TIS Guidelines: https://www.mississauga.ca/wpcontent/uploads/2023/03/Mississauga-Transportation-Impact-Study-Guidelines.pdf	Noted. The Certification Form is included in **Appendix A**.

Department/Agency	Comment	Status/Response
905.615.3200 ext. 8171	Please include evaluation for future connection to Cedar Creek Lane.	The future connection to Cedar Creek Lane is an unattractive route for site generated trips as Cedar Creek Lane is an unpaved laneway and requires eastbound vehicles to make a left-turn at an unsignalized intersection. As such, minimal traffic is expected at the future connection to Cedar Creek Lane and no operation concerns are anticipated. Thus, the future connection to Cedar Creek Lane was not analyzed herein. Further details are included in Section 6.1.
	SECTION 3.6 TRAFFIC MODELLING. In this section stated that PHF of 1.00 was used for all movements but Synchro outputs show 0.92. Please revise wording.	Noted. The Transportation and Parking Study Update has been updated to reflect the correct PHFs.
	SECTION 6.0 FUTURE TOTAL CONDITIONS. SBL approach for Dundas St East & Hanes Rd was identified as critical, additional mitigation measures should be evaluated (eg. extension of left storage lane and other).	In addition to the signal optimization proposed, the City can consider implementing an advance southbound left-turn phase at the intersection of Dundas Street East at Haines Road to alleviate the critical operations expected. It is noted that these critical conditions for the southbound left movement at Dundas Street East at Haines Road is consistent with future background conditions, as such, the advance southbound left-turn phase is future background warranted. Further details are included in Sections 4.5.1 and 7.0.

Department/Agency	Comment	Status/Response
	The TIS shall include a section in the report to address Community Impacts. This section shall include summary statements outlining the resulting traffic increases to the critical streets, movements and intersections. Comments or concerns from the community through future public meetings and engagements that are related to traffic shall also be addressed in this section.	Noted. Community impacts were reviewed in **Section 12.0**.
	The TIS should include cross reference with Dundas Connects Master Plan for proposed road network.	Noted. **Section 4.3** highlights relevant information from the Dundas Connects Master Plan. As the Dundas BRT is expected to be in operation beyond the 2027 horizon year, the future road network changes required to accommodate the BRT is not included within the analysis.
Transportation & Works, Transit Infrastructure Raazia Zahra raazia.zahra@mississauga.ca 905.615.3200	BRT: Please be advised that Higher Order Transit has been proposed for Dundas Street in the form of Bus Rapid Transit. The developer is advised to contact the BRT Office as there may be impacts to this proposed development and revise plans accordingly to reflect future condition	Noted.
Region of Peel Patrycia Menko Patrycia.menko@peelregion.ca 905.791.7800	The following are our recommendations: • Recommend bicycle parking near building entrance. • Explore unbundled parking by selling or leasing parking spaces separately from residential units. • Give consideration to preferential parking for carpool and/or carshare vehicle spaces. • Explore a pedestrian connection to existing residential community to the north. • A minimum 2m wide walkway along the 12-storey building is recommended while a 1.5m wide walkway abutting the proposed townhouses is recommended as referenced in the Peel Health Development Assessment User Guide.	Noted. Unbundled parking, as well as the provision of carshare spaces are proposed as TDM measures, as outlined in **Section 11.3**.

Department/Agency	Comment	Status/Response
	WASTE (1/3) - Prior to Site Plan approval, the Region of Peel will provide Front-End collection of Garbage and Recyclable Materials subject to Section 2.0 and 4.0 of the Waste Collection Design Standards Manual requirements being met and labelled on the Waste Management Plan drawings. In terms of Vehicle Access Route: • The turning radius from the centre line must be a minimum of 13 m on all turns. This includes the turning radii to the entrance and exit to the collection point. As per requirements, please label T304 of the TIS Report. • All roads shall be designed to have a minimum width of 6 metres. As per requirements, please label T304 of the TIS Report. • Outside the collection point, a clear height of 4.4 metres from the top of the access road, along the waste collection vehicle access and egress route is required. The clear height of 4.4 metres is free of obstructions such as sprinkler systems, ducts, wires, trees, or balconies. As per requirements, please label T304 of the TIS Report.	Noted. These labelling requirements are typically for the Site Plan and Waste Management Plan. Nevertheless, the Vehicle Turning Diagrams have been updated to include the requested dimensions.
	WASTE (2/3) - In terms of Collection Point: • The proposed waste collection point is a safety concern for the vehicle to reverse out of. A flashing warning light system and a stop sign is required to prevent pedestrian and vehicle traffic from crossing the path of a reversing collection vehicle exiting the collection point area.	Noted. A vehicle warning system, including flashing lights and convex mirrors, as well as stop signs are proposed at the loading space entrance to reduce potential conflicts between trucks exiting the loading space and other vehicles or pedestrians. Further information is included in Section 9.3. The details pertaining to the vehicle warning system will be provided at a later date.

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 20 day of June, 2023.

Name: Ian Lindley

Professional Title: Professional Engineer (P.Eng.)

Signature: Ian Lindley

Office Contact Information (Please Print)

Address: 211 Yonge Street, Suite 600

City/Postal Code: Toronto, M5B 1M4

Telephone/Extension: 416-477-3392

E-mail Address:

APPENDIX B:

Site Plan

805 DUNDAS STREET EAST, MISSISSAUGA

Proposed Mixed-Use Development

DRAWING LIST

Sheet Number	Sheet Name	Issue#1 (Add Date)	Issue#2 (Add Date)	Issue#3 (Add Date)	Issue#4 (Add Date)	Issue#5 (Add Date)
12 SITE PLAN APPROVAL						
A0						
dA0.00	Cover Sheet	■				
A1						
dA1.01	Site Survey	■				
dA1.02	Context Plan	■				
dA1.03	Site Plan	■				
dA1.04	Site Statistics	■				
A2						
dA2.01	Parking Floor Plan - Level P2	■				
dA2.02	Parking Floor Plan - Level P1	■				
dA2.03	Floor Plan - Level 1 Lower	■				
dA2.04	Floor Plan - Level 1 Upper					
dA2.05	Floor Plan - Level 2	■				
dA2.06	Floor Plan - Level 3	■				
dA2.07	Floor Plan - Level 4 & 5	■				
dA2.08	Floor Plan - Level 6 & 7	■				
dA2.09	Floor Plan - Level 8	■				
dA2.10	Floor Plan - Level 9	■				
dA2.11	Floor Plan - Level 10	■				
dA2.12	Floor Plan - Level 11 & 12	■				
dA2.13	Floor Plan - MPH	■				
dA2.14	Roof Plan	■				
A4						
dA4.01	Elevations - Condominium	■				
dA4.02	Elevations - Condominium	■				
dA4.03	Elevations - Condominium	■				
dA4.04	Elevations - Condominium	■				
dA4.05	Elevations - Townhouses	■				
A5						
dA5.01	Building Section 'A'	■				
dA5.02	Building Section 'B'					
dA5.03	Building Section 'C'	■				
dA5.04	Building Section 'D'					
A6						
dA6.01a	Sun Shadow Study - March/September 21	■				
dA6.01b	Sun Shadow Study - March/September 21	■				
dA6.02a	Sun Shadow Study - June 21	■				
dA6.02b	Sun Shadow Study - June 21	■				
dA6.03a	Sun Shadow Study - December 21	■				
A7						
dA7.01	Perspective Views					
dA7.02	Perspective Views	■				

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SURVEYOR

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Date:

KIRKOR
ARCHITECTS AND PLANNERS
20 De Boers Drive Suite 400
Toronto, ON M3J 0H1

Revisions:

No.:	Revision:	Date:

No.:	Issued For:	Date:
2	Rezoning Re-submission	xx, 2023
1	Rezoning Submission	Oct. 31, 2022

Client:
KJC PROPERTIES INC.

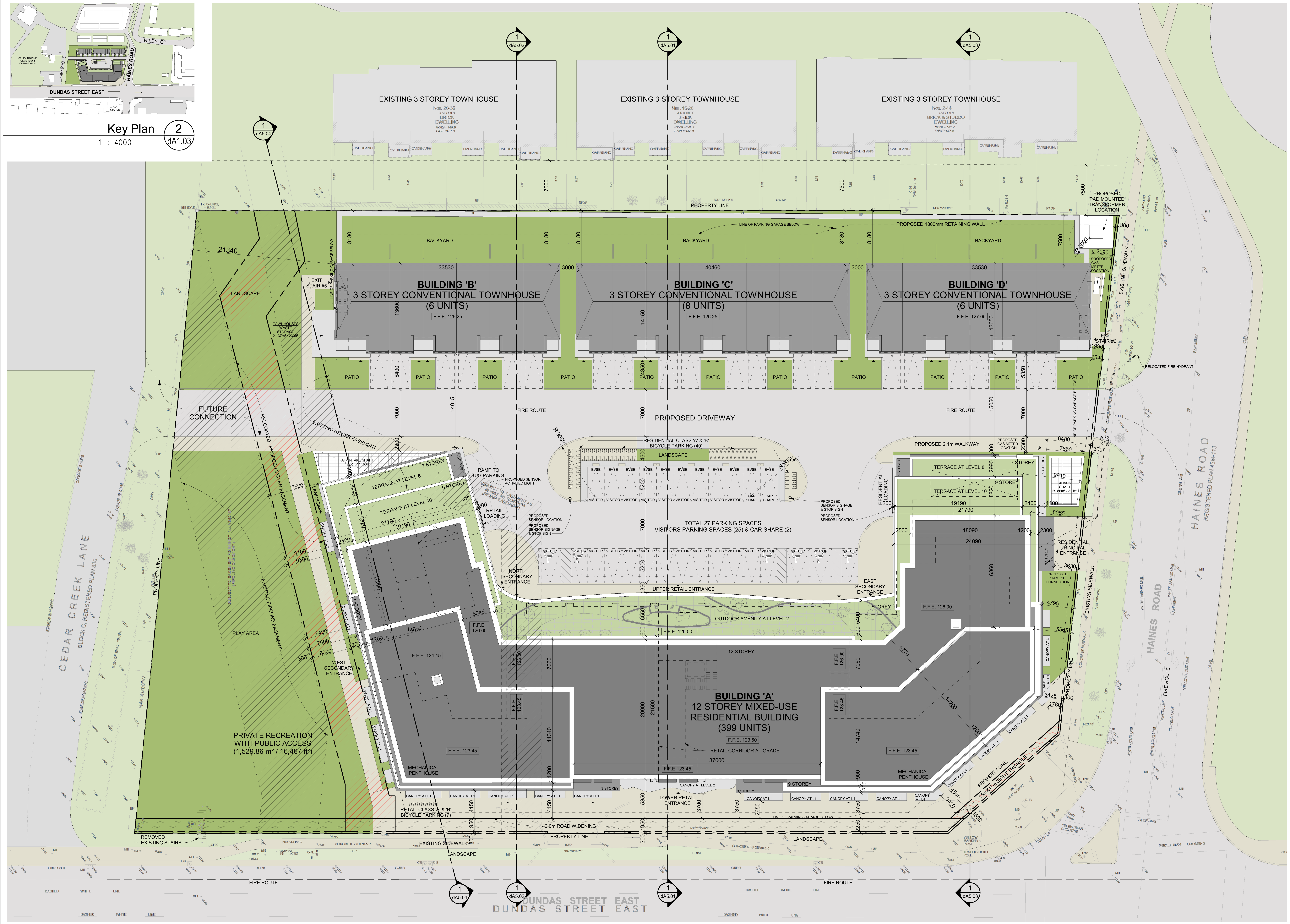
805 Dundas Street East, Mississauga, ON.
Proposed Residential Development

Drawing Title:
Cover Sheet

Scale:

Drawn by: Author
Checked by: D.S.
Project No.: 21-115
Date: JUNE 15, 2023
Drawing No.:

dA0.00



Site Plan 1 dA1.03
1 : 250

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KIRKOR
ARCHITECTS AND PLANNERS

20 De Boers Drive Suite 400
Toronto, ON M3J 0H1

Revisions:

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2	Rezoning Re-submission	xx, 2023
1	Rezoning Submission	Oct. 31, 2022

Client:
KJC PROPERTIES INC.

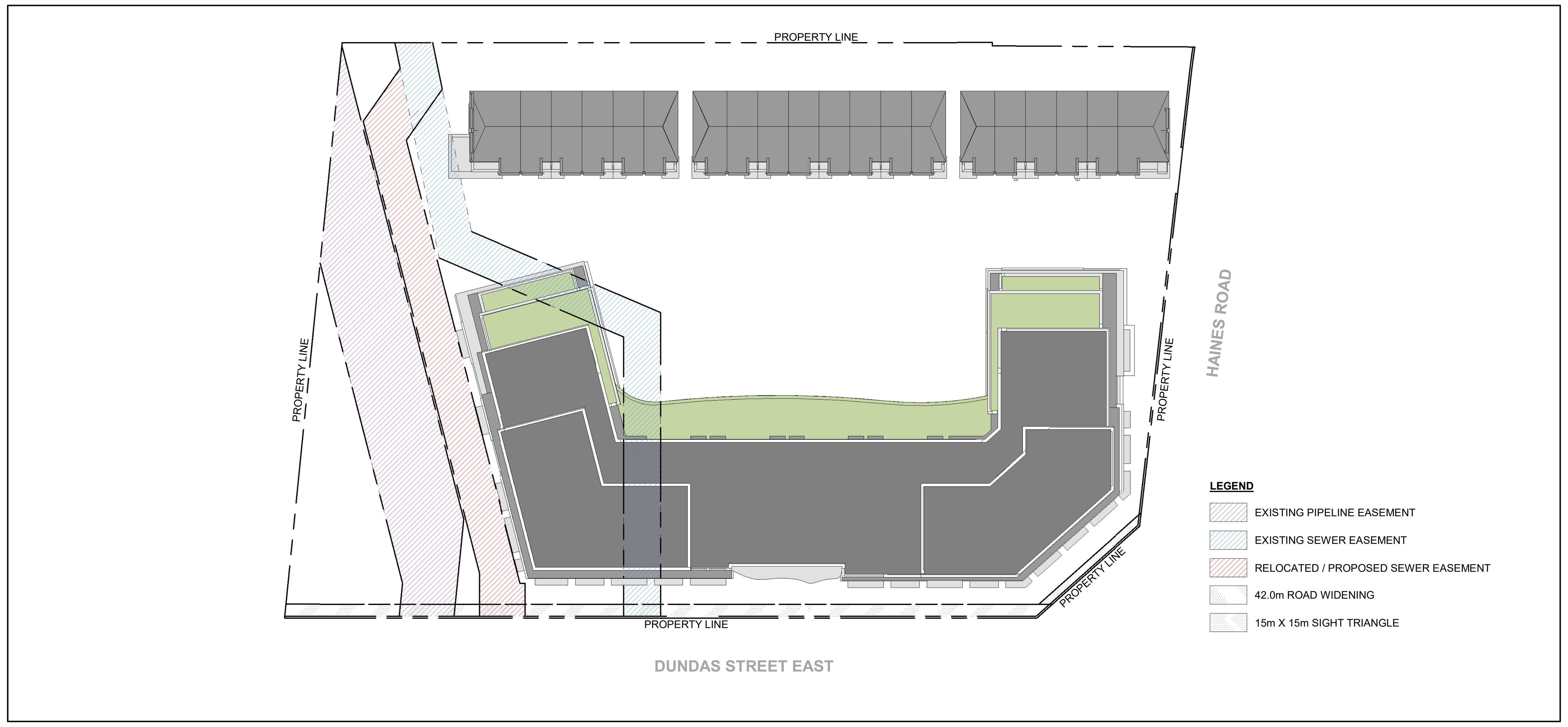
805 Dundas Street East, Mississauga, ON.
Proposed Residential Development

Drawing Title:
Site Plan

Scale: As indicated
Drawn by: G.H.
Checked by: D.S.
Project No.: 21-115
Date: JUNE 15, 2023
Drawing No.:
dA1.03

PART 1:
PLAN OF PART OF LOT 10
CONCESSION 1
NORTH OF DUNDAS STREET
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL

Legal Description 4 dA1.04



Easements Diagram 3 dA1.04

General Note:

i. I hereby certify that this drawing confirms in all respects to the site development plans Architect or Engineer's Signature (if applicable) and Professional seal.

ii. The City of Mississauga requires that all working drawings submitted to the Building Division as part of an application for the issue of a building permit shall be certified by the architect or engineer as being in conformity with the site development plan as approved by the City of Mississauga.

iii. All exterior lighting will be directed onto the site and will not infringe upon the adjacent properties.

iv. All rooftop mechanical units shall be screened from view by the applicant.

v. Parking spaces reserved for people with disabilities must be identified by a sign, installed at the applicant's expense, in accordance with the By-law Requirements and Building Code Requirements.

vi. The applicant will be responsible for ensuring that all plans confirm to Transport Canada's restrictions.

vii. Grades will be met with a 33% maximum slope at the property lines and within the site.

viii. All damaged areas are to be reinstated with topsoil and sod prior to the release of securities.

ix. Signage shown on the site development plans is for information purposes only. All signs will be subject to the provisions of Sign by-law 0054-2002, as amended, and a separate sign application will be required through the Building Division.

x. Any fencing adjacent to municipal lands is to be located 15 cm (6.0 in.) inside the property line.

xi. Only "shielded" lighting fixtures are permitted for all development, except for detached and semi-detached dwellings within 60m (196.8 ft.) of a residentially zoned property andmust confirm to the Engineer Certified Lighting Plan.

xii. The Engineer Certified Lighting Plan must be signed by the consulting Engineer.

xiii. The Owner covenants and agrees to construct and install "shielded" lighting fixtures on the subject lands, in conformity with the Site Plan and Engineer Certified Lighting Plan to the satisfaction of the City of Mississauga.

xiv. The applicant will be responsible for ensuring that all plans confirm to Transport Canada's restrictions.

xv. Where planting is to be located in landscaped areas on top of an underground parking structure, it is the responsibility of the applicant to arrange the coordination of the design of the underground parking structure with the Landscape Architect and the Consulting Engineering. Underground parking structures with landscaping area to be capable of supporting the following loads:
- 15 cm of drainage gravel plus 40 cm topsoil for sod
- 15 cm of drainage gravel plus 60 cm topsoil for shrubs
- 15 cm of drainage gravel plus 90 cm for trees
Or
- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 40 cm topsoil for sod
- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 60 cm topsoil for shrubs
- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 90 cm topsoil for trees
* Terradrain 900 or approved equal

xvi. The structural design of any retaining wall over 0.6 m in height or any retaining wall located on a property line is to be shown on the Site Grading plan for this project and is to be approved by the Consulting Engineer for the project.

xvii. Continuous 15 cm high barrier type poured concrete curbing will be provided between all asphalt and landscaped areas throughout the site.

xviii. All utility companies will be notified for locates prior to the installation of the hoarding that lies within the site and within the limited of the City boulevard area.

Additional Site Plan Notes:

1. Signage shown on the site development plans is for information purposes only. All signs will be subject to the provisions of sign by-law 0054-2002, as amended, and a separate sign application will be required through the building division.

2. The applicant is advised that they will be required to provide inspection staff 48 hours notice prior to commencement of any road construction.

3. The applicant is advised that confirmation must be received from the Development Construction Section that they have made arrangements for a preconstruction meeting.

4. Fire access route will be designed to support a load of not less than 11,363 kg. per axle and have a change in gradient of not more than 1 in 12.5 over a minimum distance of 15m.

5. If the final course of asphalt paving is delayed, install a temporary lift of asphalt at ramps or curb cuts to provide barrier-free access.

6\. 1) Prior to Site Plan Approval, the Detailed Noise Report shall determine the noise impacts associated with the mechanical equipment and ventilation systems (i.e. cooling towers, garage exhaust fans, emergency generator, HVAC units etc.) for the proposed buildings and the building(s) in the immediate vicinity to ensure that all mechanical equipment will meet the Ministry of the Environment, Conservation and Parks (MECP) guidelines for stationary noise sources.

2) Prior to Site Plan Approval, sufficient securities will be required to ensure the construction of all noise mitigation features required and recommended in the Detailed Noise Report including, noise barriers, noise screens or any off-site stationary noise mitigation.

3) Prior to Site Plan Approval, the following clause is to be included on the Site Plan: "The Acoustical Consultant shall certify to the Planning and Building Department that the 'as constructed' site features for noise control including, but not limited to noise walls and berms, the as constructed buildings, mechanical equipment and ventilation systems for the buildings on-site and the off-site stationary noise sources are in compliance with the Detailed Noise Report as prepared for the particular building and in compliance with the Ministry of the Environment, Conservation and Parks (MECP) guidelines for transportation and stationary noise sources." The Acoustical Consultant shall also certify to the Planning and Building Department that the indoor noise levels and noise levels for outdoor living areas resultant from all transportation noise sources will meet Regional guideline conditions based on outside sound energy exposures outlined in the Detailed Noise Report for the subject building.

4) Prior to the release of site plan securities, the Acoustical Consultant shall certify to the Planning and Building Department that the 'as constructed' site features for noise control including, but not limited to noise walls and berms, the as constructed buildings, mechanical equipment and ventilation systems for the buildings on site and the off-site stationary noise sources are in compliance with the Detailed Noise Report as prepared for the particular building and in compliance with the Ministry of the Environment, Conservation and Parks (MOECP) guidelines for stationary noise sources. The Acoustical Consultant shall also certify to the Planning and Building Department that the indoor noise levels and noise levels for outdoor living areas resultant from all transportation noise sources will meet Regional guideline conditions based on outside sound energy exposures outlined in the Detailed Noise Study for the subject building and that no new noise impacts have been identified since the latest approved Detailed Noise Study.

5) The site plan securities required by the Planning and Building Department will include $5000 to secure for the Noise Certification to be prepared by a Professional Engineer with experience in environmental acoustics. The $5000 securities shall only be released to the applicant when the required Noise Certification has been provided to the satisfaction of the Planning and Building Department.

6) Prior to Site Plan Approval, the details of all noise screens and noise walls are to be provide to ascertain how they impact the site design, building designs and landscape design. Prior to Site Plan Approval, The Noise Consultant shall confirm that the design ad details of the noise walls/screens are in accordance with the specifications provided in the Detailed Noise Study and were these screens also provide a combined wind protection function, the Wind consultant shall also confirm that they are in accordance with the recommendations of the Quantitative Wind Study.

7. The Applicant will provide a minimum of one (1) week written notice to the Manager of Park Planning, and the Manager of Storm Water Management, City of Mississauga, prior to initiating any construction activities within the adjoining parkland, which had been approved through the development application. The Applicant accepts the responsibility for arranging all necessary repairs to and the reinstatement of, the adjoining greenbelt land / storm water pond, due to damages incurred by the construction works associated with this application. The Applicant acknowledges that securities being held by the City will be released only upon completion of all construction activities and the repairs/reinstatement works for the parkland / storm water pond, to the satisfaction of Transportation and Works in consultation with the Community Services Department.

Signature of Owner______________________

Name of Owner______________________

Date______________________

General Notes 2 dA1.04

1.0 Legal Description

SURVEYOR'S REAL PROPERTY REPORT
PART 1:
PLAN OF PART OF LOT 10
CONCESSION 1
NORTH OF DUNDAS STREET
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL

2.0 Site Area

Site Area	hectares	acres	sq.m.	sq.ft.
Development Area	1.0992	2.7161	10,991.72	118,314
Private Recreation with Public Access	0.1440	0.3558	1,439.80	15,498
42.0m Road Widening	0.0274	0.0676	273.50	2,944
15m X 15m Sight Triangle	0.0031	0.0075	30.54	329
Total Site Area	**1.2736**	**3.1470**	**12,735.56**	**137,084**

3.0 Proposed Residential GFA

Gross Floor Area (GFA) — **means the sum of the areas of each storey of a building, structure or part thereof, above or below established grade, excluding storage below established grade and a parking structure above or below established grade, measured from the exterior of outside walls, or from the midpoint of common walls.**

Residential — means the sum of the areas of each storey of a building measured from the exterior of outside walls but shall not include any part of the building used for motor vehicle parking or bicycle parking.

Non-Residential — means the sum of the areas of each storey above or below established grade, measured from the exterior of outside walls, or from the midpoint of common walls, including the area of any floor systems or assembly located within a storey which is designed or used for access and passage by persons and including all parts of the building or structure or part thereof below established grade used for retail, office, industrial or wearhouse uses, but exclusing the following:
(1) any part of the building, structure or part thereof used for mechanical floor area;
(2) areas of stairwells, washrooms or elevators;
(3) any enclosed area used for the collection or storage of disposable or recyclable waste generated within the building or structure or part thereof;
(4) any part of the building or structure or part thereof above or below established grade used for motor vehicle parking or the provision of loading spaces;
(5) any part of the building, structure or part thereof below established grade used for storage incidental to other uses in the building, structure or part thereof or provided and reserved for the personal needs of the occupants of the building, structure or part thereof including lunch rooms, lounges or fitness rooms;
(6) accessory outdoor tank. (0379-2009)

3.10 **Proposed Residential GFA - 12 Storey Condominium - Building 'A'**

			floors	sq.m.	sq.m.	sq.ft.
Level	1 Lower		1 x	227.23	227.23	2,446
Level	1 Upper		1 x	652.56	652.56	7,024
Level	2		1 x	2,759.77	2,759.77	29,706
Level	3		1 x	2,932.76	2,932.76	31,568
Level	4	to 5	2 x	2,887.52	5,775.04	62,162
Level	6	to 7	2 x	2,880.04	5,760.08	62,001
Level	8		1 x	2,726.97	2,726.97	29,353
Level	9		1 x	2,706.16	2,706.16	29,129
Level	10		1 x	2,345.30	2,345.30	25,245
Level	11	to 12	2 x	2,313.61	4,627.22	49,807
Total Residential GFA - Building 'A'					**30,513.09**	**328,440**

3.11 **Proposed Residential GFA - 3 Storey Convential Townhouses - Building 'B' 'C' & 'D'**

	sq.m.	sq.ft.
Building 'B'	1,121.54	12,072
Building 'C'	1,378.09	14,834
Building 'D'	1,126.35	12,124
Total Residential GFA - Building 'B' 'C' & 'D'	**3,625.98**	**39,030**

3.12 **Proposed Parking Garage GFA**

	sq.m.	sq.ft.
Level P2	437.46	4,709
Level P1	1,320.25	14,211
Total Parking Garage GFA	**1,757.71**	**18,920**

3.13 **Total Residential GFA**

	sq.m.	sq.ft.
Total Residential GFA - Building 'A'	30,513.09	328,440
Total Residential GFA - Building 'B' 'C' & 'D'	3,625.98	39,030
Total Parking Garage GFA	1,757.71	18,920
Total Residential GFA	**35,896.78**	**386,390**

3.20 **Proposed GFA - Retail**

		sq.m.	sq.ft.
Retail	at Level 1 Lower	1,753.20	18,871
Retail Storage	at Level 1 Lower	268.58	2,891
Retail - Common / Service Areas	at Level 1 Lower	129.84	1,398
Retail - Common / Service Areas	at Level 1 Upper	221.93	2,389
Total Retail GFA		**2,373.55**	**25,549**

3.30 **Total GFA**

	sq.m.	sq.ft.
Total Residential GFA	35,896.78	386,390
Total Retail GFA	2,373.55	25,549
Total GFA	**38,270.33**	**411,938**

4.0 Proposed Density - FSI

FSI	Total GFA	Total Site Area	FSI
	38,270.33	÷ 12,735.56 sq.m.	**3.00**

5.0 Unit Count

5.10 **Units - Building 'A'**

				JR. 1 BR	1 BR	2 BR	3 BR	No. of Units
Levels	2		1 x	3	17	4	2	26
Levels	3		1 x	0	29	9	2	40
Levels	4	to 5	2 x	2	29	9	1	82
Levels	6	to 7	2 x	2	29	10	0	82
Levels	8		1 x	0	28	6	3	37
Levels	9		1 x	0	26	6	4	36
Levels	10		1 x	1	21	8	2	32
Levels	11	to 12	2 x	1	21	8	2	64
Total Units - Building 'A'				**14**	**279**	**87**	**19**	**399**

5.20 **Units - Building 'B' 'C' & 'D'**

	3 BR	4 BR	No. of Units
Building 'B'	5	1	6
Building 'C'	8	0	8
Building 'D'	5	1	6
Total Units - Building 'B' 'C' & 'D'	**18**	**2**	**20**

5.30 **Total Units**

	JR. 1 BR	1 BR	2 BR	3 BR	4 BR	No. of Units
Total Units - Building 'A'	*14*	*279*	*87*	*19*	*0*	*399*
Total Units - Building 'B' 'C' & 'D'	*0*	*0*	*0*	*18*	*2*	*20*
Total Units	**14**	**279**	**87**	**37**	**2**	**419**
Percentage	*3.3%*	*66.6%*	*20.8%*	*8.8%*	*0.5%*	*100.0%*

6.0 Vehicular Parking

Gross Floor Area (GFA) — **means the sum of the areas of each storey of a building, structure or part thereof, above or below established grade, excluding storage below established grade and a parking structure above or below established grade, measured from the exterior of outside walls, or from the midpoint of common walls.**

Gross Floor Area as per Zoning By-law 3.1.1.9 — **Alternative Gross Floor Area Deductions for Non-Residential Uses**
For the purposes of calculating required parking for a non-residential use, gross floor area, as defined by this By-law, may be used instead of gross floor area - nonresidential as contained in Table 3.1.2.2 of this By-law and the following deductions to the total gross floor area calculated shall apply: 2% for manufacturing facility and warehouse/distribution facility, wholesaling facility, 10% for office and medical office uses and 5% for all other non-residential uses.

Non-Residential GFA Calculation for Parking

		sq.m.	sq.ft.
Retail	at Level 1 Lower	1,753.20	18,871
Retail - Common / Service Areas	at Level 1 Lower	129.84	1,398
Retail - Common / Service Areas	at Level 1 Upper	221.93	2,389
Total Non-Residential GFA Calculation for Parking		**2,104.97**	**22,658**

GFA as per Zoning By-law 3.1.1.9	Total Non-Residential GFA Calculation for Parking (sq.m.)	Deduction (%)	sq.m.	sq.ft.
Alternative Gross Floor Area Deductions for Non-Residential Uses	2104.97	5%	**1,999.72**	**22,658**

6.10 **Parking Ratio Proposed**

	Ratio
Residential - Condominium Residents	1.00 /unit
Residential - Townhouses Residents	2.00 /unit
Greater of	
Residential - Condominium Visitors	0.20 /unit
Residential - Townhouses Visitors	0.25 /unit
Non-Residential	3.5/100m²
Accessible Parking Regulations	1.0 space plus 3% of the total
EVSE Parking	75%

6.11 **Visitors Parking Required**

	No. of Units / Area (sq.m.)	Ratio	Parking Spaces
Residential - Condominium Visitors	399	0.20 /unit	80
Residential - Townhouses Visitors	20	0.25 /unit	5
Non-Residential (Alternative Gross Floor Area Deductions for Non-Residential Uses)	1999.72	3.5/100m²	70

6.20 **Parking Proposed**

	Units	Ratio	Parking Spaces
Residential - Condominium Residents	399	1.00 /unit	399
Residential - Townhouses Residents	20	2.00 /unit	40
Residential - Condominium Visitors			80
Residential - Townhouses Visitors			5
Total Parking Proposed			**524**

6.21 **Parking Provided**

	At Grade	Level P1	Level P2	Parking Spaces
Residential - Condominium Residents	0	159	240	399
Residential - Townhouses Residents	40	0	0	40
Condominium & Townhouses Visitors / Non-Residential	25	60	0	85
Car Share	2	0	0	2
Total Parking Provided	**67**	**219**	**240**	**526**

6.30 **Accessible Parking Required**

	Total Parking Provided	Ratio	Parking Spaces
	526	1 space plus 3%	17

6.31 **Accessible Parking Provided**

	At Grade	Level P1	Level P2	Parking Spaces
Shared Retail / Residential - Accessible Parking Regulations	6	4	7	17

6.40 **EVSE Parking Required**

	Percentage	EVSE Parking Required
EVSE Parking	20%	105

6.41 **EVSE Parking Provided**

	Percentage		EVSE Parking Provided
EVSE Parking	75%		395
Level P2		*240*	
Level P1		*124*	
At Grade		*31*	

7.0 Bicycle Parking

7.10 **Bicycle Parking Ratio Proposed**

	Ratio
Condominium - Class A	0.60 /unit
Condominium - Class B	0.05 /unit or 6 spaces (greater value)
Retail - Class A	0.15 /100m²
Retail - Class B	0.20 /100m²

7.20 **Bicycle Parking Proposed**

	Units / Area (sq.m.)	Ratio	Parking Spaces
Condominium - Class A	399	0.60 /unit	239
Condominium - Class B	399	0.05 /unit	20
Retail - Class A	1999.72	0.15 /100m²	3
Retail - Class B	1999.72	0.20 /100m²	4
Total Bicycle Parking Proposed			**266**

7.30 **Bicycle Parking Required at Grade**

	Units	Percentage	Parking Spaces
Condominium	399	10%	40

7.40 **Bicycle Parking Provided**

	At Grade	Level P1	Level P2	Parking Spaces
Condominium - Class A	20	150	69	239
Condominium - Class B	20	0	0	20
Retail - Class A	3	0	0	3
Retail - Class B	4	0	0	4
Total Bicycle Parking Provided	**47**	**150**	**69**	**266**

8.0 Amenity Space

8.10 **Zoning Regulations - Indoor & Outdoor Amenity Space**

	Zoning Regulations
Minimum Amenity Area	The greater of 5.6m² per dwelling unit or 10% of the site area

8.20 **Amenity Space Required**

	Units	Ratio	sq.m.	sq.ft.
Minimum Amenity Area per dewlling unit	419	5.6m²	2,346.40	25,256

8.30 **Amenity Space Provided**

	sq.m.	sq.ft.
At Grade - Outdoor Private Recreation with Public Access	30.54	329
Level 2 - Outdoor Amenity	359.53	3,870
Level 2 - Indoor Amenity	702.06	7,557
Total Amenity Space Provided	**1,092.13**	**11,756**

9.0 Coverage

	sq.m.	sq.ft.	Coverage
Building Coverage	5,320.12	57,265	**41.77%**
Paved Areas	2,033.25	21,886	**15.97%**
Shaft Penetrations	72.37	779	**0.57%**
Landscaped Areas	5,309.82	57,154	**41.69%**
Net Site Area	**12,735.56**	**137,084**	**100.00%**

10.0 Loading

Loading Provided		No. of Loading
Condominium	Type 'G' - 13.0m X 4.0m X 6.1m	1
Retail	Type 'C' - 6.0m X 3.5m X 3.0m	1

11.0 Building Height

Building 'A' - Condominium	12 Storey
Building 'B' - Townhouses	3 Storey
Building 'C' - Townhouses	3 Storey
Building 'D' - Townhouses	3 Storey

Site Statistics 1 dA1.04

Authorities Having Jurisdiction

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Do not scale the drawings.

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Date:

KIRKOR
ARCHITECTS AND PLANNERS
20 De Boers Drive Suite 400
Toronto, ON M3J 0H1

Revisions:

No.:	Revision:	Date:

No.:	Issued For:	Date:
2	Rezoning Re-submission	xx, 2023
1	Rezoning Submission	Oct. 31, 2022

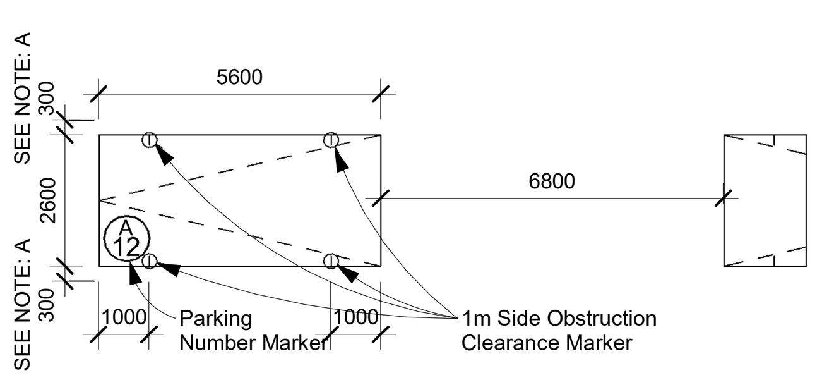
Client:
KJC PROPERTIES INC.

805 Dundas Street East, Mississauga, ON.
Proposed Residential Development

Drawing Title:
Site Statistics

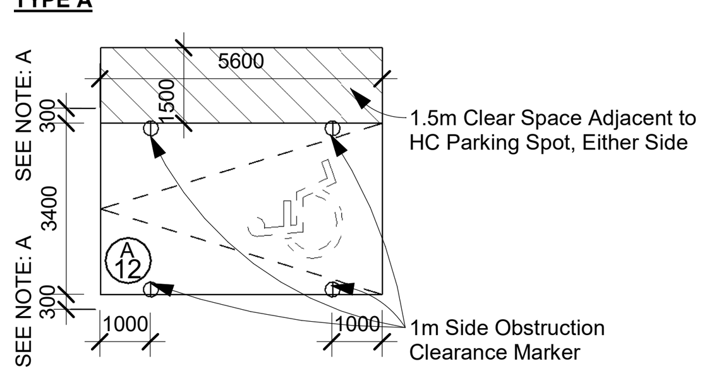
Scale: 1 : 600
Drawn by: G.H.
Checked by: D.S.
Project No.: 21-115
Date: JUNE 15, 2023
Drawing No.:
dA1.04

TYPICAL PARKING SPACE:
Drive Aisle @ 6.8m min.

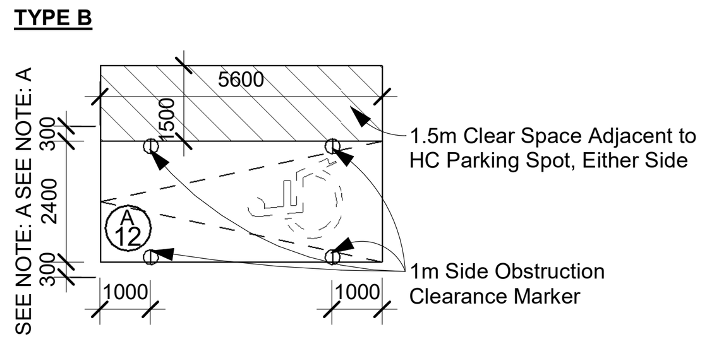


ACCESSIBLE PARKING SPACE:

TYPE A

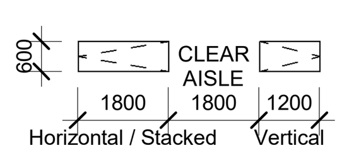


TYPE B

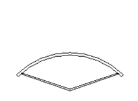


NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

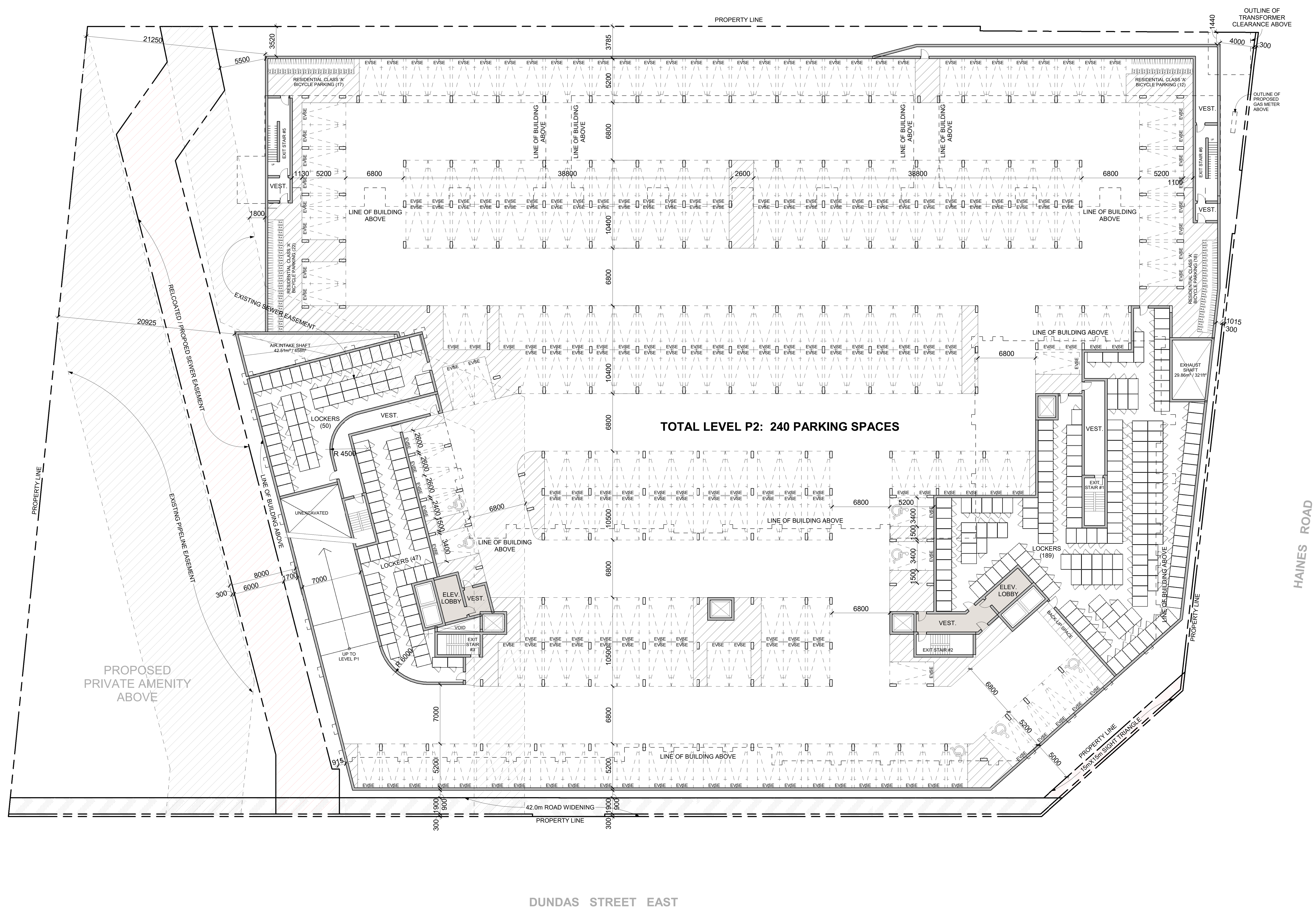
BICYCLE PARKING SPACE LEGEND



CONVEX MIRROR



Parking Space Legend 2 dA2.01
NTS



Floor Plan - Level P2 1 dA2.01
1 : 250

N

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Date:

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ARCHITECTS AND PLANNERS
20 De Boers Drive Suite 400
Toronto, ON M3J 0H1

Revisions:

No.:	Revision:	Date:

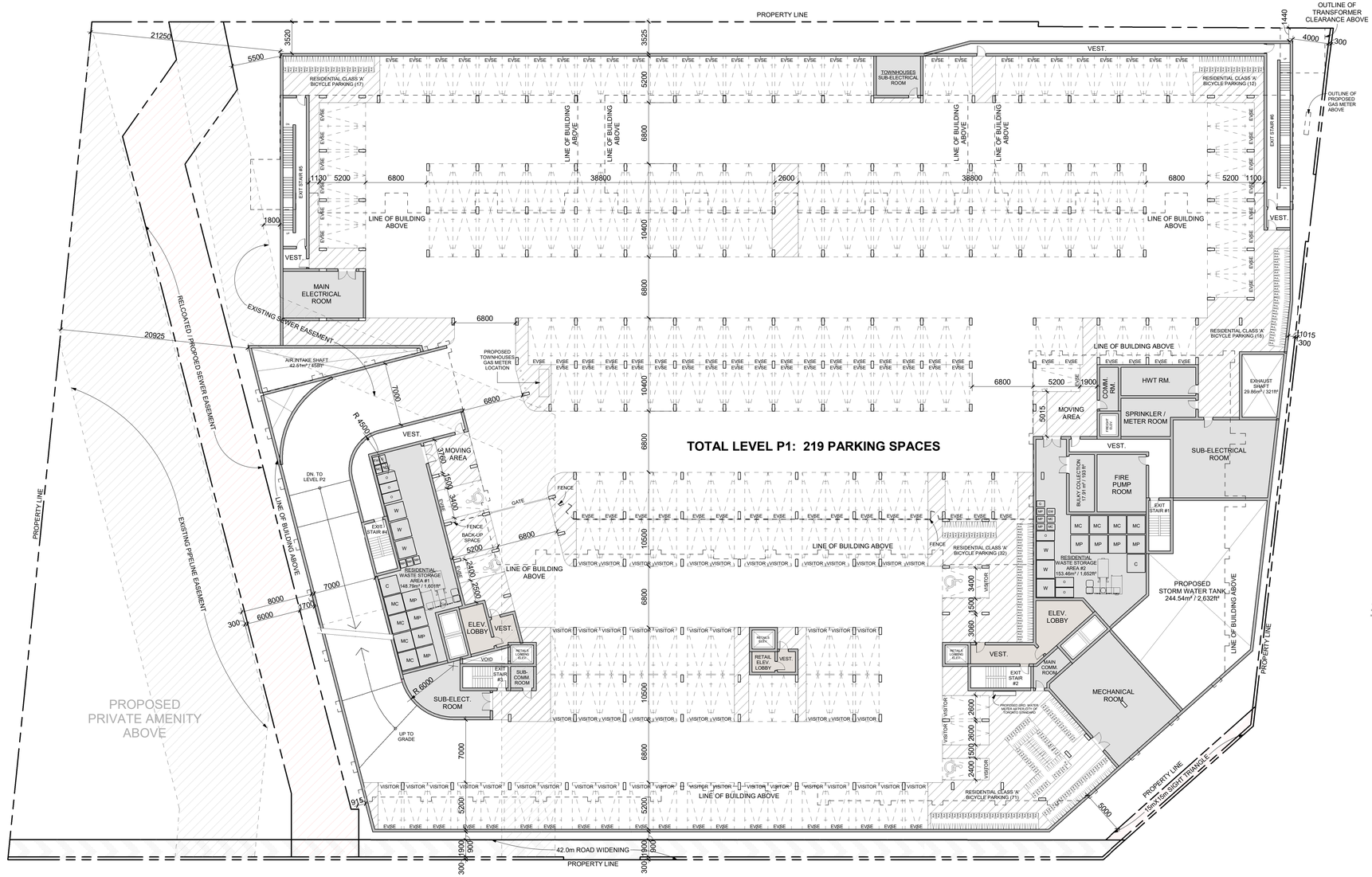
No.:	Issued For:	Date:
2	Rezoning Re-submission	xx, 2023
1	Rezoning Submission	Oct. 31, 2022

Client:
KJC PROPERTIES INC.

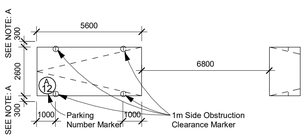
805 Dundas Street East, Mississauga, ON.
Proposed Residential Development

Drawing Title:
Parking Floor Plan - Level P2

Scale: As indicated
Drawn by: G.H.
Checked by: D.S.
Project No.: 21-115
Date: JUNE 15, 2023
Drawing No.:
dA2.01

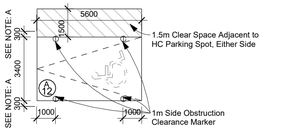


TYPICAL PARKING SPACE:
Drive Aisle @ 6.8m min.

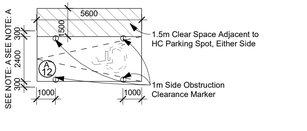


ACCESSIBLE PARKING SPACE:

TYPE A



TYPE B



NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BICYCLE PARKING SPACE LEGEND

CONVEX MIRROR

Parking Space Legend 2 dA2.02
NTS

Floor Plan - Level P1 1 dA2.02
1 : 250

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Date:

KIRKOR
ARCHITECTS AND PLANNERS
20 De Boers Drive Suite 400
Toronto, ON M3J 0H1

Revisions:

No.:	Revision:	Date:
2	Rezoning Re-submission	xx, 2023
1	Rezoning Submission	Oct. 31, 2022
No.:	Issued For:	Date:

Client:
KJC PROPERTIES INC.

805 Dundas Street East, Mississauga, ON.
Proposed Residential Development

Drawing Title:
Parking Floor Plan - Level P1

Scale: As indicated
Drawn by: G.H.
Checked by: D.S.
Project No.: 21-115
Date: JUNE 15, 2023
Drawing No.:
dA2.02

Date Plotted: 6/15/2023 10:14:23 AM File Path: C:\Revit\2021\21115\P1_805 Dundas Street East_detached2.rvt

MAXIMUM POROSITY OF VENTILATION GRATES IS 20mm X 20mm.

Grates Porosity 2 dA2.04

NTS

Floor Plan - Level 1 Upper 1 dA2.04

1 : 250

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Revisions:

No.:	Revision:	Date:

No.:	Issued For:	Date:
2	Rezoning Re-submission	xx, 2023
1	Rezoning Submission	Oct. 31, 2022

Client:
KJC PROPERTIES INC.

805 Dundas Street East, Mississauga, ON.
Proposed Residential Development

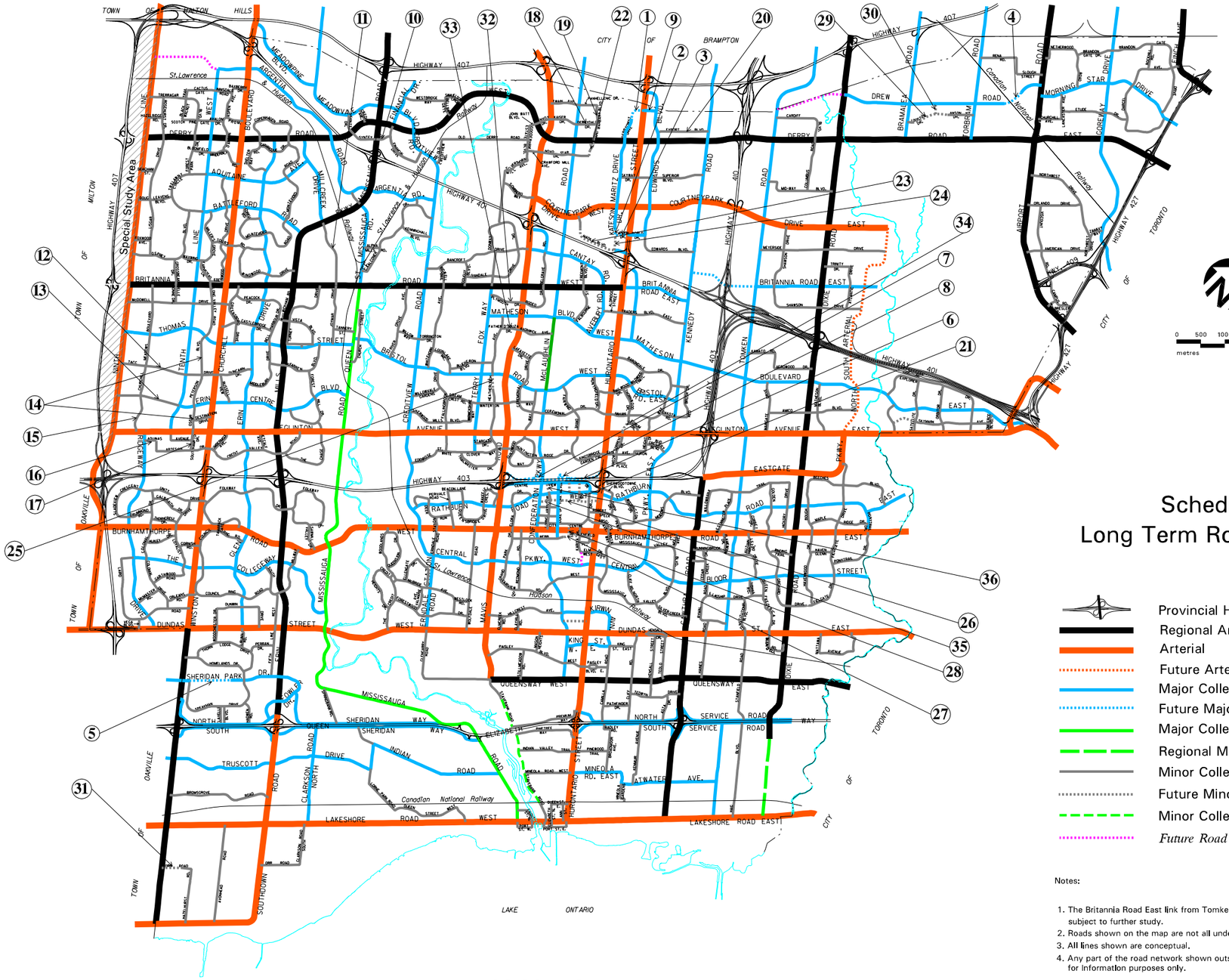
Drawing Title:
Floor Plan - Level 1 Upper

Scale: As indicated
Drawn by: G.H.
Checked by: D.S.
Project No.: 21-115
Date: JUNE 15, 2023
Drawing No.:

dA2.04

APPENDIX C:

City of Mississauga Official Plan Excerpts



Schedule 5
Long Term Road Network

- Provincial Highway and Interchange
- Regional Arterial
- Arterial
- Future Arterial (conceptual)
- Major Collector
- Future Major Collector (conceptual)
- Major Collector (Scenic Route)
- Regional Major Collector (Scenic Route)
- Minor Collector
- Future Minor Collector
- Minor Collector (Scenic Route)
- *Future Road Link to be added.*

Notes:

1. The Britannia Road East link from Tomken Road to Kennedy Road is conceptual and is subject to further study.
2. Roads shown on the map are not all under Mississauga jurisdiction.
3. All lines shown are conceptual.
4. Any part of the road network shown outside the city boundaries is shown for information purposes only.

MISSISSAUGA
Planning and Building

2011 January

The following amendments have been made:

Major Collector Roads to be shown as Future Major Collector Roads

1. Derrycrest Drive, west of Hurontario Street;
2. Kateson Drive, north of Capston Drive;
3. Capston Drive, from Kateson Drive to Hurontario Street;
4. Drew Road, just west of West Mimico Creek to south of CNR tracks;
5. Sheridan Park Drive, between the west and east leg of Speakman Drive;
6. North Service Road, from Mavis Road to Cawthra Road;
7. Confederation Parkway, North Service Road ramps;
8. Duke of York, Highway 403 flyover;

Minor Collector Roads to be shown as Major Collector Roads

9. Topflight Drive, between Hurontario Street to Edwards Boulevard (revised to complete the ring road);

Future Minor Collector Roads to be shown as Built Minor Collector Roads

10. Syntex Court, between Mississauga Road and Financial Drive;
11. Millcreek Drive, south of Southfield Road to Britannia Road West;
12. Tacc Drive, between Ninth Line and Winston Churchill Boulevard;
13. Erin Centre Boulevard, between Churchill Meadows Boulevard and Tenth Line West;
14. Oscar Peterson Boulevard, between Thomas Street and Tacc Drive, between Erin Centre Boulevard and Eglinton Avenue;
15. Churchill Meadows Boulevard, between Erin Centre Boulevard and Eglinton Avenue West;
16. Aquinas Avenue, between Ridgeway Drive and Sebastian Drive;
17. Southampton Drive, between Eglinton Avenue West and Artesian Drive;
18. Derrydale Drive, between McLaughlin Road and Saint Barbara Boulevard;
19. Saint Barbara Boulevard, between Panhellenic Drive and Derry Road West;
20. Export Boulevard, between Beckett Drive and Kennedy Road;
21. Hammerson Drive, between Rathburn Road West and the future Square One Drive;

Minor Collector Roads to be shown as Future Minor Collector Roads

22. Saint Barbara Boulevard, between Derry Road West and Longview Place;
23. Madill Boulevard, south of Courtneypark Drive to Kateson Drive;
24. Kateson Drive, between Capston Drive and Madill Boulevard;
25. Heatherleigh Avenue, between Bristol Road West and Fairford Crescent;
26. Square One Drive, between Living Arts Drive and City Centre Drive;
27. Webb Drive, east of Duke of York to Kariya Drive;
28. Proposed north/south road, between City Centre Drive and Webb Drive;
29. Logistics Drive, east of Bramalea Road to Anson Drive;
30. David Hunting Drive, between Drew Road and Logistics Drive;
31. Orr Road, west of Hazelhurst Road to Winston Churchill Boulevard;

Roads to be Added as Built Minor Collectors

32. Plymouth Drive, between Terry Fox Way to Mavis Road;
33. Father D'Souza Drive, between Heatherleigh Avenue to Mavis Road;

Roads to be Added as Future Minor Collectors

34. Sorrento Drive, between Eglinton Avenue East and Forum Drive;
35. Square One Drive, east of Confederation Parkway to Living Arts Drive; and
36. Living Arts Drive, between Rathburn Road West and Centre View Drive.

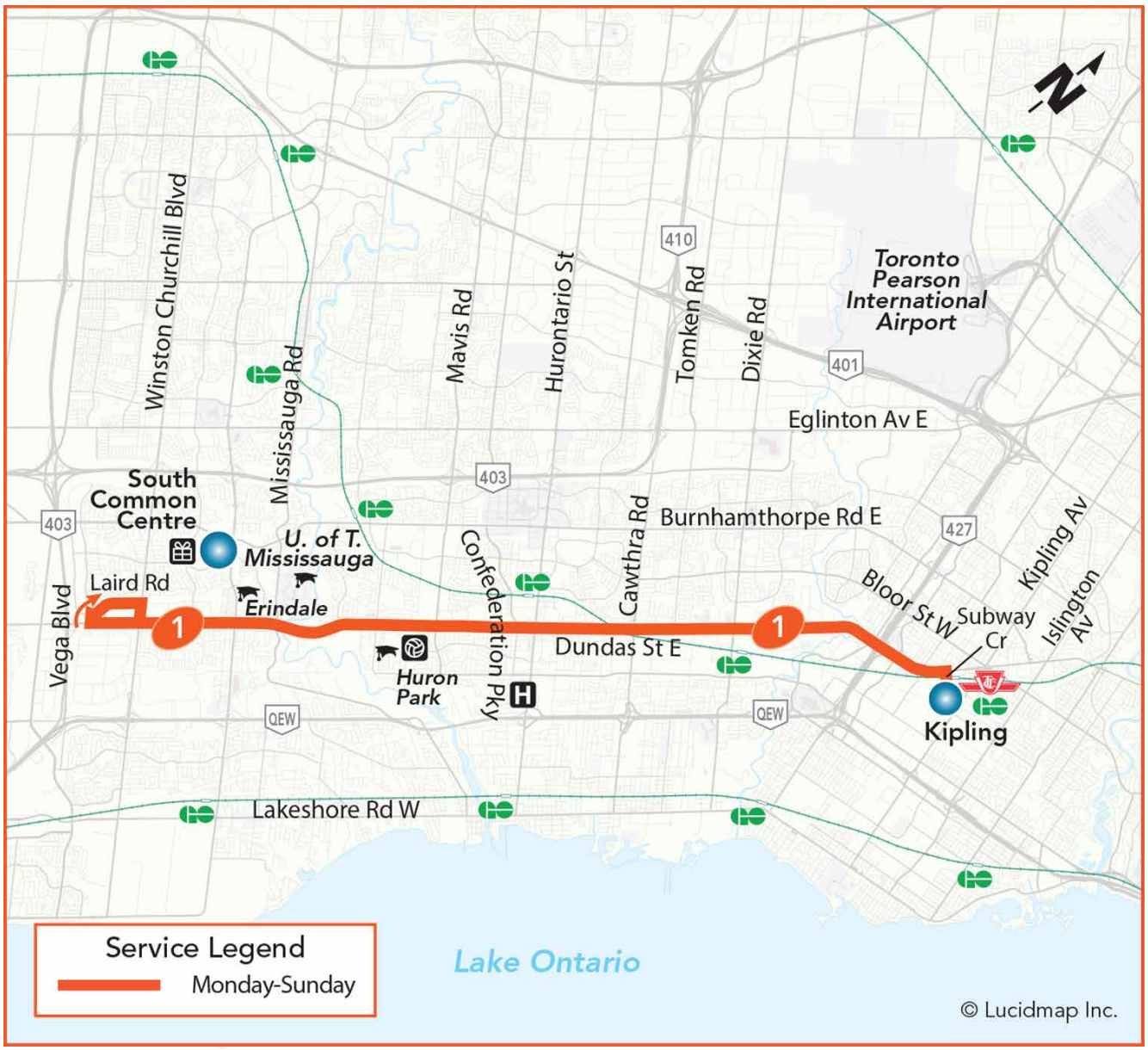
APPENDIX D:

Transit Maps

1 Dundas

Local Route
Monday to Sunday

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



Legend

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

Effective: January 4, 2021

MiWAY MISSISSAUGA

51 Tomken

Local Route
Monday to Saturday

Northbound to Cardiff Blvd
Southbound to Stanfield Rd

Legend

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

Effective: January 04, 2016

MiWAY MISSISSAUGA

APPENDIX E:

Traffic Data

Farah Tasnim

To: Tyler Xuereb
Cc: Ian Lindley; Aaron Wignall
Subject: RE: 802 Dundas Street Terms of Reference and Data Request (CFC 2297-6402)

From: Tyler Xuereb <Tyler.Xuereb@mississauga.ca>
Sent: Monday, June 13, 2022 9:23 AM
To: Farah Choudhury <fchoudhury@cfcrozier.ca>
Cc: Ian Lindley <ilindley@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>
Subject: RE: 802 Dundas Street Terms of Reference and Data Request (CFC 2297-6402)

Good Morning Farah,

Below are the recommended growth rates to be used along Dundas Street and Tomken Road for your study.

Dundas Street

	Compounded Annual Growth from Existing to 2026	
	EB	WB
AM Peak	0.5%	1.0%
PM Peak	0.5%	0.5%

	Compounded Annual Growth from 2026 to 2027	
	EB	WB
AM Peak	0.0%	0.0%
PM Peak	0.0%	0.0%

Tomken Road

	Compounded Annual Growth from Existing to 2026	
	NB	SB
AM Peak Hour	2.0%	2.0%
PM Peak Hour	2.0%	2.0%

	Compounded Annual Growth from 2026 to 2027	
	NB	SB
AM Peak Hour	0.5%	0.0%
PM Peak Hour	0.0%	1.0%

Rates from 2026 to 2027 show a 0.0% growth due to the lane reductions along Dundas Street as a result of BRT implementation.

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

Please consider the environment before printing.

From: Farah Choudhury <fchoudhury@cfcrozier.ca>
Sent: Friday, June 10, 2022 2:47 PM
To: Tyler Xuereb <Tyler.Xuereb@mississauga.ca>
Cc: Ian Lindley <ilindley@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>
Subject: RE: 802 Dundas Street Terms of Reference and Data Request (CFC 2297-6402)

Hello Tyler,

Thank you for your assistance. I was looking to follow up whether the TMC data and growth rate data previously requested for the intersections/roadways of Dundas/Haines and Dundas/Tomken was available? The payment for the TMC data was made earlier this week.

Please let me know if you had any further questions, and I hope you have a wonderful weekend!

Kind regards,

Farah Choudhury, 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.

File: CA.13.SIG
Signal Timing Request
RT.07.1301
RT.07.1303

Jun. 10, 2022

Dear Farah Choudhury:

Re: Traffic Signal Timings

Please find the attached traffic signal timings for the intersections of:

Dundas Street at Haines Road
Dundas Street E at Tomken Road

The side street phases (4, 8) are actuated; meaning a vehicle or pedestrian must be present on the side street before the side street is given a green indication. Vehicle presence on the side street would result in a possible green time of between the minimum and maximum time noted, depending on demand. Pedestrian "Walk" and flashing "Don't Walk" time on the side street, as noted, would be used in the event that the pedestrian push button is activated. During the side street pedestrian indications, the side street vehicle green is concurrently displayed. Should there be no demand on the actuated phase, the signals would result in a green indication on the major street (2, 6).

Note: All times recorded in seconds, based on full demand.

The time of day plan is used for system control operation. In the event that the coordination pattern has a cycle length, offset and split value identified, the cycle length, split and offset values, as noted, would be used. However, when the time of day plan is programed using 'Action' 8, the mode is 'Free', meaning no cycle length, split and offset

values are given and the intersection operates using the phase timings provided in the report.

Should you require further information, please contact Yelena Klimenko, at 905-615-3200 ext. 3211.

Sincerely,

Yelena Klimenko
Traffic Systems Coordinator, Traffic Systems and ITS
Traffic Signals and Street Lighting
Transportation and Works Department
City of Mississauga
905-615-3200 ext. 3211
yelena.klimenko@mississauga.ca

c: Jim Kartsomanis, Supervisor, Traffic Systems and ITS

Volume Result Details by Hour Report

Location..... DUNDAS ST E btwn TOMKEN RD & UNNAMED URES

Municipality..... Mississauga

Count Station..... 1302

Direction..... Both Directions

Date	Time Period		Count	Peak Hour
Tuesday, December 05, 2017				
	12:00 AM	01:00 AM	278	☐
	01:00 AM	02:00 AM	166	☐
	02:00 AM	03:00 AM	111	☐
	03:00 AM	04:00 AM	98	☐
	04:00 AM	05:00 AM	151	☐
	05:00 AM	06:00 AM	451	☐
	06:00 AM	07:00 AM	1197	☐
	07:00 AM	08:00 AM	2278	☐
	08:00 AM	09:00 AM	2710	☐
	09:00 AM	10:00 AM	2180	☐
	10:00 AM	11:00 AM	2276	☐
	11:00 AM	12:00 PM	2441	☐
	12:00 PM	01:00 PM	2769	☐
	01:00 PM	02:00 PM	2766	☐
	02:00 PM	03:00 PM	2723	☐
	03:00 PM	04:00 PM	2928	☐
	04:00 PM	05:00 PM	3240	☐
	05:00 PM	06:00 PM	3354	☑
	06:00 PM	07:00 PM	2885	☐
	07:00 PM	08:00 PM	2138	☐
	08:00 PM	09:00 PM	1704	☐
	09:00 PM	10:00 PM	1232	☐
	10:00 PM	11:00 PM	813	☐
	11:00 PM	12:00 AM	532	☐
Total			**41,421**	

Volume Result Details by Hour Report

Location..... DUNDAS ST E btwn CEDAR CREEK LANE & HAINES RD

Municipality..... Mississauga

Count Station..... 2008

Direction..... Both Directions

Date	Time Period		Count	Peak Hour
Wednesday, March 28, 2018				
	12:00 AM	01:00 AM	244	☐
	01:00 AM	02:00 AM	141	☐
	02:00 AM	03:00 AM	94	☐
	03:00 AM	04:00 AM	73	☐
	04:00 AM	05:00 AM	168	☐
	05:00 AM	06:00 AM	369	☐
	06:00 AM	07:00 AM	1149	☐
	07:00 AM	08:00 AM	2005	☐
	08:00 AM	09:00 AM	2339	☐
	09:00 AM	10:00 AM	2071	☐
	10:00 AM	11:00 AM	2069	☐
	11:00 AM	12:00 PM	2201	☐
	12:00 PM	01:00 PM	2324	☐
	01:00 PM	02:00 PM	2289	☐
	02:00 PM	03:00 PM	2451	☐
	03:00 PM	04:00 PM	2566	☐
	04:00 PM	05:00 PM	2765	☐
	05:00 PM	06:00 PM	3000	☑
	06:00 PM	07:00 PM	2659	☐
	07:00 PM	08:00 PM	2114	☐
	08:00 PM	09:00 PM	1543	☐
	09:00 PM	10:00 PM	1133	☐
	10:00 PM	11:00 PM	724	☐
	11:00 PM	12:00 AM	416	☐
Total			**36,907**	

Volume Result Details by Hour Report

Location..... TOMKEN RD btwn FLAGSHIP DR & UNNAMED UEDU

Municipality..... Mississauga

Count Station.....

Direction..... Both Directions

Date	Time Period		Count	Peak Hour
Thursday, August 03, 2017				
	12:00 AM	01:00 AM	121	☐
	01:00 AM	02:00 AM	42	☐
	02:00 AM	03:00 AM	46	☐
	03:00 AM	04:00 AM	26	☐
	04:00 AM	05:00 AM	28	☐
	05:00 AM	06:00 AM	131	☐
	06:00 AM	07:00 AM	350	☐
	07:00 AM	08:00 AM	561	☐
	08:00 AM	09:00 AM	656	☐
	09:00 AM	10:00 AM	638	☐
	10:00 AM	11:00 AM	632	☐
	11:00 AM	12:00 PM	658	☐
	12:00 PM	01:00 PM	721	☐
	01:00 PM	02:00 PM	759	☐
	02:00 PM	03:00 PM	773	☐
	03:00 PM	04:00 PM	894	☐
	04:00 PM	05:00 PM	1053	☐
	05:00 PM	06:00 PM	1248	☑
	06:00 PM	07:00 PM	972	☐
	07:00 PM	08:00 PM	759	☐
	08:00 PM	09:00 PM	651	☐
	09:00 PM	10:00 PM	410	☐
	10:00 PM	11:00 PM	337	☐
	11:00 PM	12:00 AM	196	☐
Total			**12,662**	

Volume Result Details by Hour Report

Location..... TOMKEN RD btwn RYMAL RD & UNNAMED URES

Municipality..... Mississauga

Count Station.....

Direction..... Both Directions

Date	Time Period		Count	Peak Hour
Thursday, June 21, 2018				
	12:00 AM	01:00 AM	111	☐
	01:00 AM	02:00 AM	53	☐
	02:00 AM	03:00 AM	33	☐
	03:00 AM	04:00 AM	37	☐
	04:00 AM	05:00 AM	42	☐
	05:00 AM	06:00 AM	161	☐
	06:00 AM	07:00 AM	397	☐
	07:00 AM	08:00 AM	618	☐
	08:00 AM	09:00 AM	842	☐
	09:00 AM	10:00 AM	640	☐
	10:00 AM	11:00 AM	629	☐
	11:00 AM	12:00 PM	700	☐
	12:00 PM	01:00 PM	809	☐
	01:00 PM	02:00 PM	770	☐
	02:00 PM	03:00 PM	793	☐
	03:00 PM	04:00 PM	933	☐
	04:00 PM	05:00 PM	1041	☐
	05:00 PM	06:00 PM	1276	☑
	06:00 PM	07:00 PM	972	☐
	07:00 PM	08:00 PM	779	☐
	08:00 PM	09:00 PM	628	☐
	09:00 PM	10:00 PM	473	☐
	10:00 PM	11:00 PM	321	☐
	11:00 PM	12:00 AM	228	☐
Total			**13,286**	

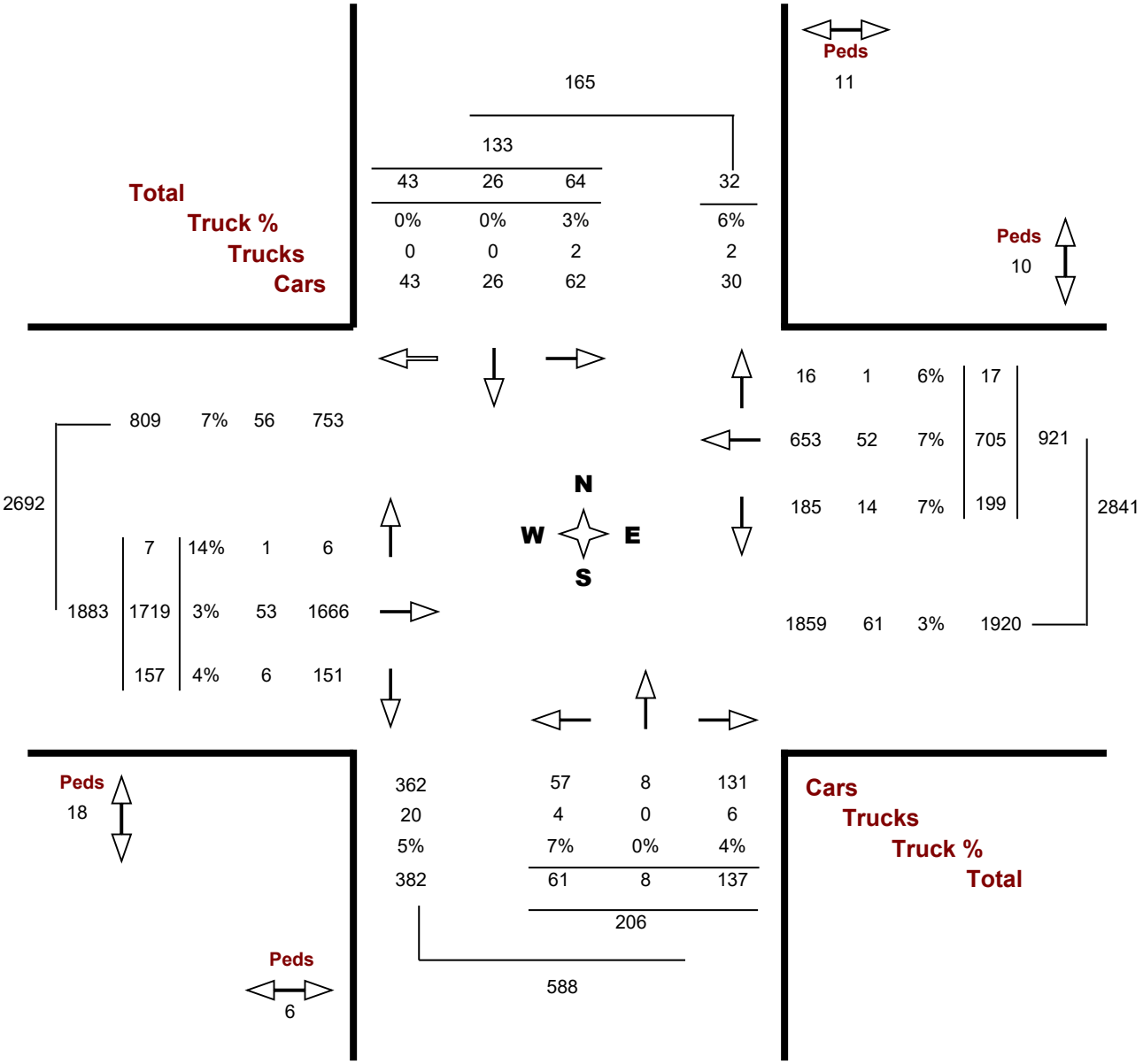
Turning Movements Report - AM Period

Location..... DUNDAS ST E @ HAINES RD

Municipality..... Mississauga **GeoID.....** 350689

Count Date..... Tuesday, 04 February, 2014 **Peak Hour.....** 08:00 AM — 09:00 AM

Road 1 HAINES RD **Road 2** DUNDAS ST E



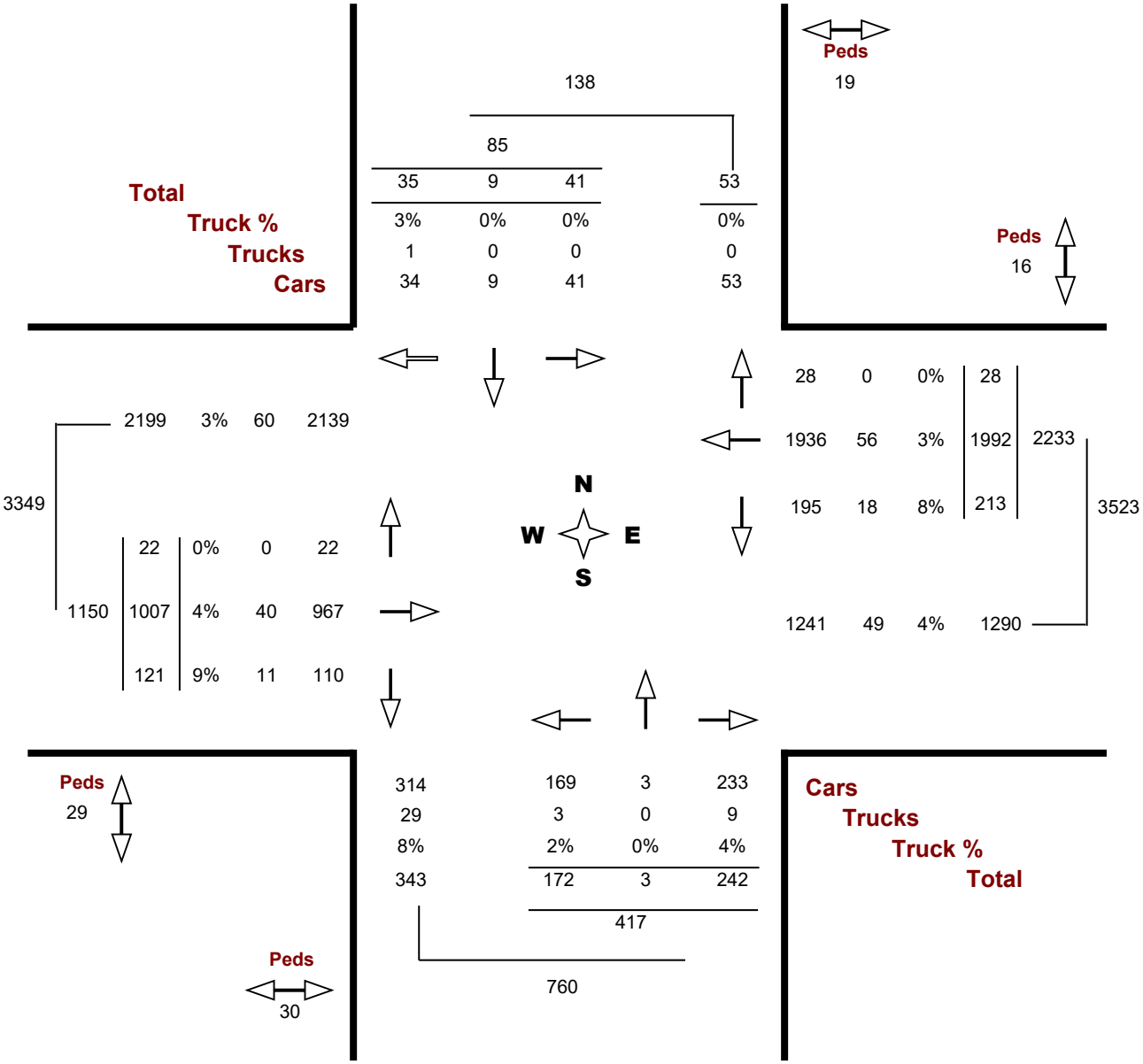
Turning Movements Report - PM Period

Location..... DUNDAS ST E @ HAINES RD

Municipality..... Mississauga **GeoID.....** 350689

Count Date..... Tuesday, 04 February, 2014 **Peak Hour.....** 04:45 PM — 05:45 PM

Road 1 HAINES RD **Road 2** DUNDAS ST E



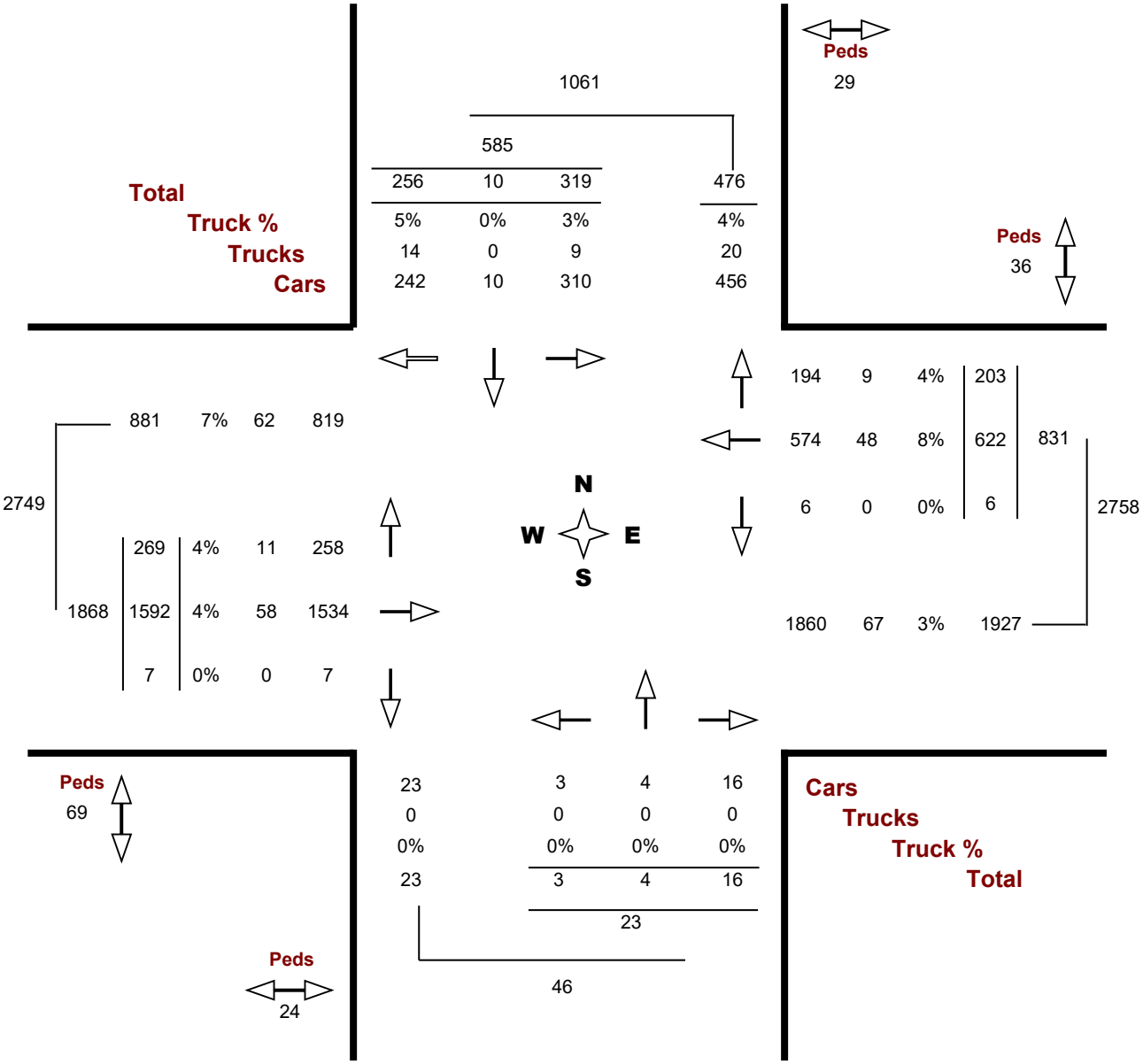
Turning Movements Report - AM Period

Location..... DUNDAS ST E @ TOMKEN RD

Municipality..... Mississauga **GeoID.....** 350812

Count Date..... Thursday, 06 February, 2014 **Peak Hour.....** 08:00 AM — 09:00 AM

Road 1 TOMKEN RD **Road 2** DUNDAS ST E



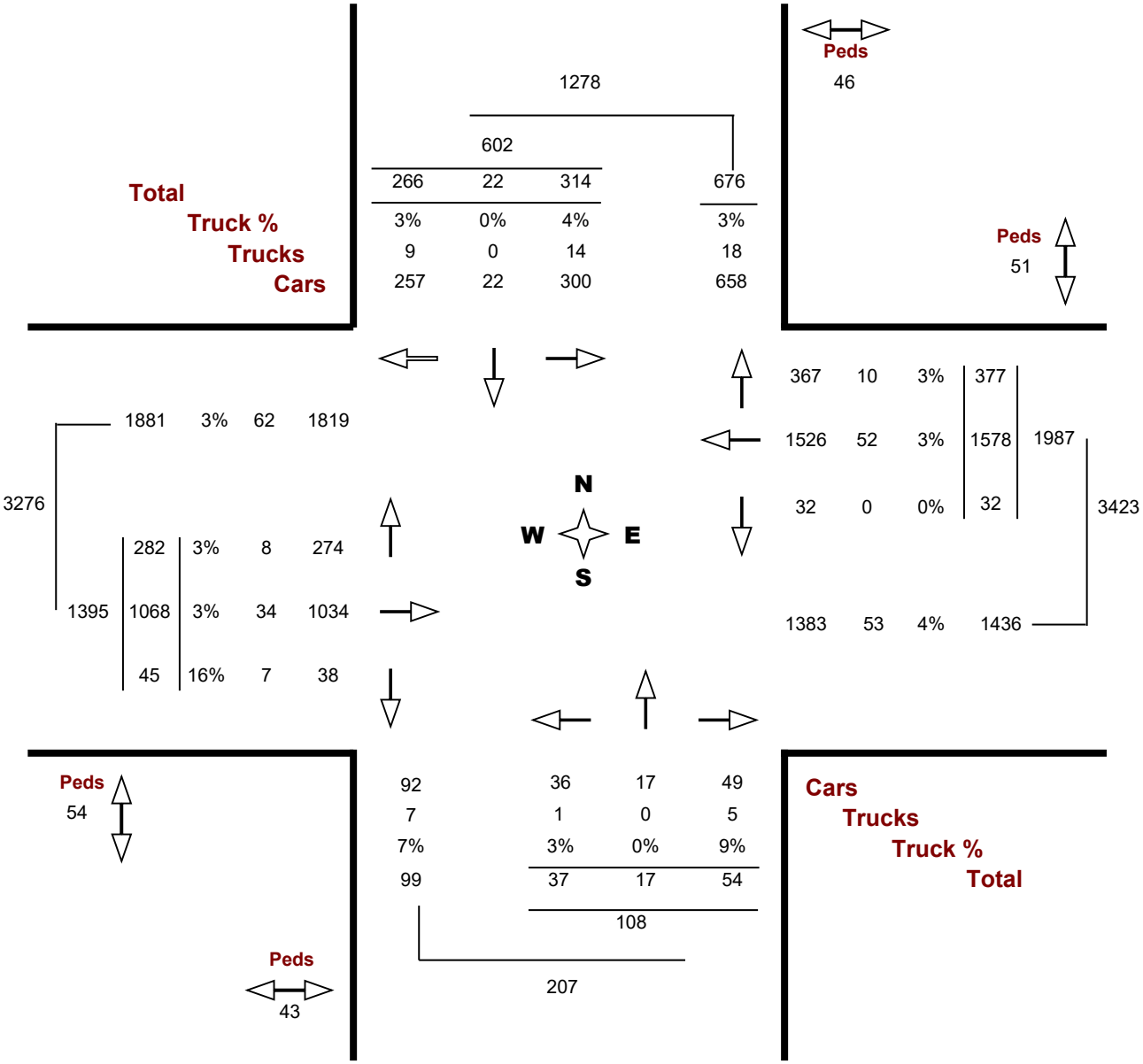
Turning Movements Report - PM Period

Location..... DUNDAS ST E @ TOMKEN RD

Municipality..... Mississauga **GeoID.....** 350812

Count Date..... Thursday, 06 February, 2014 **Peak Hour.....** 04:30 PM — 05:30 PM

Road 1 TOMKEN RD **Road 2** DUNDAS ST E



Date: June 1, 2022
From: Farah Choudhury, Crozier Consulting Engineers
Re: Growth Rates Data Request – Cawthra Road north of Dundas Street East

Farah,
Here are the estimated CAGR values for Cawthra Road north of Dundas Street East:

2016 – 2021	2021 – 2031
0.5%	0.5%

These growth rates are estimated based on multiple sources including Peel Travel Demand forecasting model, ATR and land use/forecasts data. Please note that this area may be further affected by future growth (after 2031 and beyond). An additional significant role may play future GTA West highway (particularly its timing and location). Please use your professional judgement when using these values.

If you require further assistance, please contact me at jade.huangfu@peelregion.ca.

Regards,

Jade Huangfu
Transportation Analyst, Transportation System Planning
Transportation Division, Public Works Services, Region of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9
W: (905) 791-7800 x4905
E: jade.huangfu@peelregion.ca

TMC - Intersection Count Summary

Company name: Trans-Plan Inc.
Company address: 24 Ryerson Avenue, Suite 211,Toronto, Ontario, Canada
Company phone: (647) 931-7383

Site: 1703858
Location: Ramp to Cawthra Road at Dundas Street, Mississauga
N/S Street: Ramp to Cawthra Road
E/W Street: Dundas Street
GPS Coordinates: 43.593282, -79.601023
Date: 26 May 2015
Day of week: Tuesday
Analyst(s): Kevin Lagdameo

VEHICLE TRAFFIC

Interval	SouthBound				WestBound				NorthBound				EastBound				Total
	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	
26/05/2015 07:00	93	4	18	115	4	72	32	108	1	1	3	5	38	239	2	279	507
26/05/2015 07:15	83	6	24	113	2	86	30	118	3	5	3	11	31	294	2	327	569
26/05/2015 07:30	94	2	28	124	1	133	51	185	1	3	1	5	35	369	2	406	720
26/05/2015 07:45	112	5	31	148	4	110	50	164	1	9	3	13	36	355	7	398	723
Hourly Total	382	17	101	500	11	401	163	575	6	18	10	34	140	1257	13	1410	2519
26/05/2015 08:00	83	5	45	133	2	132	54	188	0	2	3	5	58	339	4	401	727
26/05/2015 08:15	97	5	37	139	2	162	65	229	6	5	3	14	38	343	7	388	770
26/05/2015 08:30	99	11	39	149	2	174	70	246	5	1	6	12	37	324	0	361	768
26/05/2015 08:45	107	11	53	171	5	159	65	229	2	5	4	11	48	282	7	337	748
Hourly Total	386	32	174	592	11	627	254	892	13	13	16	42	181	1288	18	1487	3013
26/05/2015 09:00	2	0	1	3	0	0	1	1	0	0	0	0	0	0	0	0	4
26/05/2015 09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	2	0	1	3	0	0	1	1	0	0	0	0	0	0	0	0	4
Grand Total	770	49	276	1095	22	1028	418	1468	19	31	26	76	321	2545	31	2897	5536
Approach %	70	4	25	99	1	70	28	99	25	41	34	100	11	88	1	100	-
Total %	14	1	5	20	0	19	8	27	0	1	0	1	6	46	1	53	-

AM Peak Hour 8:00 AM - 9:00 AM

Vehicle Total	386	32	174	592	11	627	254	892	13	13	16	42	181	1288	18	1487	3013
Car	374	32	166	572	10	589	236	835	13	12	16	41	176	1252	18	1446	2894
Truck	12	0	8	20	1	38	17	56	0	1	0	1	5	35	0	40	117
Bicycle	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	2

Interval	SouthBound				WestBound				NorthBound				EastBound				Total
	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	
26/05/2015 11:00	91	15	37	143	3	164	75	242	7	10	6	23	51	206	4	261	669
26/05/2015 11:15	87	7	38	132	11	180	73	264	9	15	12	36	33	188	8	229	661
26/05/2015 11:30	73	13	45	131	5	216	101	322	4	6	4	14	49	220	5	274	741
26/05/2015 11:45	110	11	64	185	11	184	80	275	10	14	8	32	50	208	8	266	758
Hourly Total	361	46	184	591	30	744	329	1103	30	45	30	105	183	822	25	1030	2829
26/05/2015 12:00	65	9	54	128	8	235	78	321	14	8	5	27	44	222	9	275	751
26/05/2015 12:15	94	12	40	146	10	202	102	314	11	10	10	31	38	196	5	239	730
26/05/2015 12:30	85	9	64	158	8	221	94	323	5	11	7	23	55	228	3	286	790
26/05/2015 12:45	89	14	66	169	8	187	89	284	5	5	6	16	47	219	11	277	746
Hourly Total	333	44	224	601	34	845	363	1242	35	34	28	97	184	865	28	1077	3017
26/05/2015 13:00	77	14	65	156	6	208	84	298	10	11	7	28	52	265	4	321	803
26/05/2015 13:15	81	12	70	163	10	201	85	296	10	16	5	31	37	186	5	228	718
26/05/2015 13:30	63	12	52	127	7	236	81	324	6	5	7	18	42	233	9	284	753
26/05/2015 13:45	74	10	59	143	5	228	100	333	8	11	12	31	49	177	1	227	734
Hourly Total	295	48	246	589	28	873	350	1251	34	43	31	108	180	861	19	1060	3008
26/05/2015 14:00	0	0	2	2	0	28	1	29	0	0	0	0	0	22	0	22	53
26/05/2015 14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	2	2	0	28	1	29	0	0	0	0	0	22	0	22	53
Grand Total	989	138	656	1783	92	2490	1043	3625	99	122	89	310	547	2570	72	3189	8907
Approach %	55	8	37	100	3	69	29	101	32	39	29	100	17	81	2	100	-
Total %	11	2	7	20	1	28	12	41	1	1	1	3	6	29	1	36	-

Midday Peak Hour 12:15 PM - 1:15 PM

Vehicle Total	345	49	235	629	32	818	369	1219	31	37	30	98	192	908	23	1123	3069
Car	333	47	224	604	31	783	348	1162	31	37	28	96	188	864	23	1075	2937
Truck	12	1	11	24	1	34	21	56	0	0	1	1	4	43	0	47	128
Bicycle	0	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	4

Interval	SouthBound				WestBound				NorthBound				EastBound				Total
	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	Left	Thru	Right	B. Total	
26/05/2015 15:00	58	9	64	131	3	242	96	341	4	15	4	23	42	174	3	219	714
26/05/2015 15:15	65	12	67	144	5	286	106	397	7	10	6	23	56	217	11	284	848
26/05/2015 15:30	84	12	60	156	6	266	107	379	11	9	10	30	42	222	5	269	834
26/05/2015 15:45	72	11	83	166	3	287	97	387	9	13	1	23	44	201	6	251	827
Hourly Total	279	44	274	597	17	1081	406	1504	31	47	21	99	184	814	25	1023	3223
26/05/2015 16:00	71	15	74	160	10	332	144	486	2	9	7	18	49	188	5	242	906
26/05/2015 16:15	70	8	87	165	2	338	114	454	6	10	5	21	47	174	4	225	865
26/05/2015 16:30	61	7	89	157	6	370	130	506	7	4	4	15	57	207	2	266	944
26/05/2015 16:45	57	10	72	139	5	330	137	472	3	9	6	18	50	177	5	232	861
Hourly Total	259	40	322	621	23	1370	525	1918	18	32	22	72	203	746	16	965	3576
26/05/2015 17:00	54	6	83	143	7	375	147	529	16	8	5	29	55	201	4	260	961
26/05/2015 17:15	72	4	73	149	11	417	152	580	1	6	4	11	34	191	7	232	972
26/05/2015 17:30	58	6	68	132	6	360	123	489	4	13	5	22	51	210	6	267	910
26/05/2015 17:45	75	5	78	158	1	357	135	493	4	8	6	18	46	209	4	259	928
Hourly Total	259	21	302	582	25	1509	557	2091	25	35	20	80	186	811	21	1018	3771
26/05/2015 18:00	2	0	5	7	0	9	9	18	1	1	1	3	0	1	0	1	29
26/05/2015 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	2	0	5	7	0	9	9	18	1	1	1	3	0	1	0	1	29
Grand Total	799	105	903	1807	65	3969	1497	5531	75	115	64	254	573	2372	62	3007	10599
Approach %	44	6	50	100	1	72	27	100	30	45	25	100	19	79	2	100	-
Total %	8	1	9	18	1	37	14	52	1	1	1	3	5	22	1	28	-

PM Peak Hour 5:00 PM - 6:00 PM

Vehicle Total	259	21	302	582	25	1509	557	2091	25	35	20	80	186	811	21	1018	3771
Car	256	18	297	571	25	1486	552	2063	25	34	20	79	184	787	21	992	3705
Truck	3	1	5	9	0	23	5	28	0	0	0	0	2	22	0	24	61
Bicycle	0	2	0	2	0	0	0	0	0	1	0	1	0	2	0	2	5

PEDESTRIAN CROSSING

	North East			North West			South West			South East			Total
	Left	Right	Total	Left	Right	Total	Left	Right	Total	Left	Right	Total	
26/05/2015 07:00:00	0	0	0	3	5	8	0	0	0	0	0	0	8
26/05/2015 07:15:00	1	4	5	6	6	12	1	0	1	0	0	0	18
26/05/2015 07:30:00	0	2	2	3	6	9	1	0	1	0	0	0	12
26/05/2015 07:45:00	0	1	1	4	5	9	0	0	0	0	0	0	10
Hourly Total	1	7	8	16	22	38	2	0	2	0	0	0	48
26/05/2015 08:00:00	0	0	0	0	2	2	0	0	0	0	0	0	2
26/05/2015 08:15:00	0	1	1	1	2	3	0	0	0	0	0	0	4
26/05/2015 08:30:00	0	0	0	1	2	3	0	0	0	0	0	0	3
26/05/2015 08:45:00	0	1	1	4	5	9	1	0	1	0	0	0	11
Hourly Total	0	2	2	6	11	17	1	0	1	0	0	0	20
26/05/2015 09:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0
26/05/2015 09:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	9	10	22	33	55	3	0	3	0	0	0	68

AM Peak Hour 7:00 AM - 8:00 AM

Pedestrians	1	7	8	16	22	38	2	0	2	0	0	0	48

26/05/2015 11:00:00	0	0	0	1	0	1	1	0	1	0	0	0	2
26/05/2015 11:15:00	2	3	5	4	3	7	0	0	0	0	0	0	12
26/05/2015 11:30:00	0	1	1	0	1	1	1	0	1	0	0	0	3
26/05/2015 11:45:00	0	0	0	2	4	6	0	0	0	1	0	1	7
Hourly Total	2	4	6	7	8	15	2	0	2	1	0	1	24
26/05/2015 12:00:00	0	2	2	3	0	3	3	0	3	0	0	0	8
26/05/2015 12:15:00	0	0	0	7	1	8	3	0	3	1	1	2	13
26/05/2015 12:30:00	0	1	1	1	1	2	2	0	2	0	0	0	5
26/05/2015 12:45:00	0	1	1	2	4	6	1	0	1	0	0	0	8
Hourly Total	0	4	4	13	6	19	9	0	9	1	1	2	34
26/05/2015 13:00:00	0	4	4	0	2	2	5	0	5	0	0	0	11
26/05/2015 13:15:00	0	1	1	1	2	3	2	0	2	0	0	0	6
26/05/2015 13:30:00	0	2	2	5	4	9	0	0	0	0	0	0	11
26/05/2015 13:45:00	0	6	6	5	1	6	1	0	1	0	0	0	13
Hourly Total	0	13	13	11	9	20	8	0	8	0	0	0	41
26/05/2015 14:00:00	0	1	1	0	0	0	0	0	0	0	0	0	1
26/05/2015 14:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	1	1	0	0	0	0	0	0	0	0	0	1
Grand Total	2	22	24	31	23	54	19	0	19	2	1	3	100

Midday Peak Hour 1:00 PM - 2:00 PM

Pedestrians	0	13	13	11	9	20	8	0	8	0	0	0	41

	North East			North West			South West			South East			Total
	Left	Right	Total	Left	Right	Total	Left	Right	Total	Left	Right	Total	
26/05/2015 15:00:00	0	2	2	2	1	3	6	0	6	0	0	0	11
26/05/2015 15:15:00	0	1	1	1	1	2	3	0	3	1	0	1	7
26/05/2015 15:30:00	0	4	4	1	0	1	3	0	3	0	0	0	8
26/05/2015 15:45:00	0	2	2	8	2	10	3	0	3	0	0	0	15
Hourly Total	0	9	9	12	4	16	15	0	15	1	0	1	41
26/05/2015 16:00:00	0	3	3	3	2	5	4	0	4	0	0	0	12
26/05/2015 16:15:00	0	1	1	6	0	6	2	0	2	0	0	0	9
26/05/2015 16:30:00	0	1	1	3	1	4	6	1	7	0	0	0	12
26/05/2015 16:45:00	0	3	3	0	3	3	3	1	4	0	0	0	10
Hourly Total	0	8	8	12	6	18	15	2	17	0	0	0	43
26/05/2015 17:00:00	0	2	2	9	1	10	10	0	10	0	0	0	22

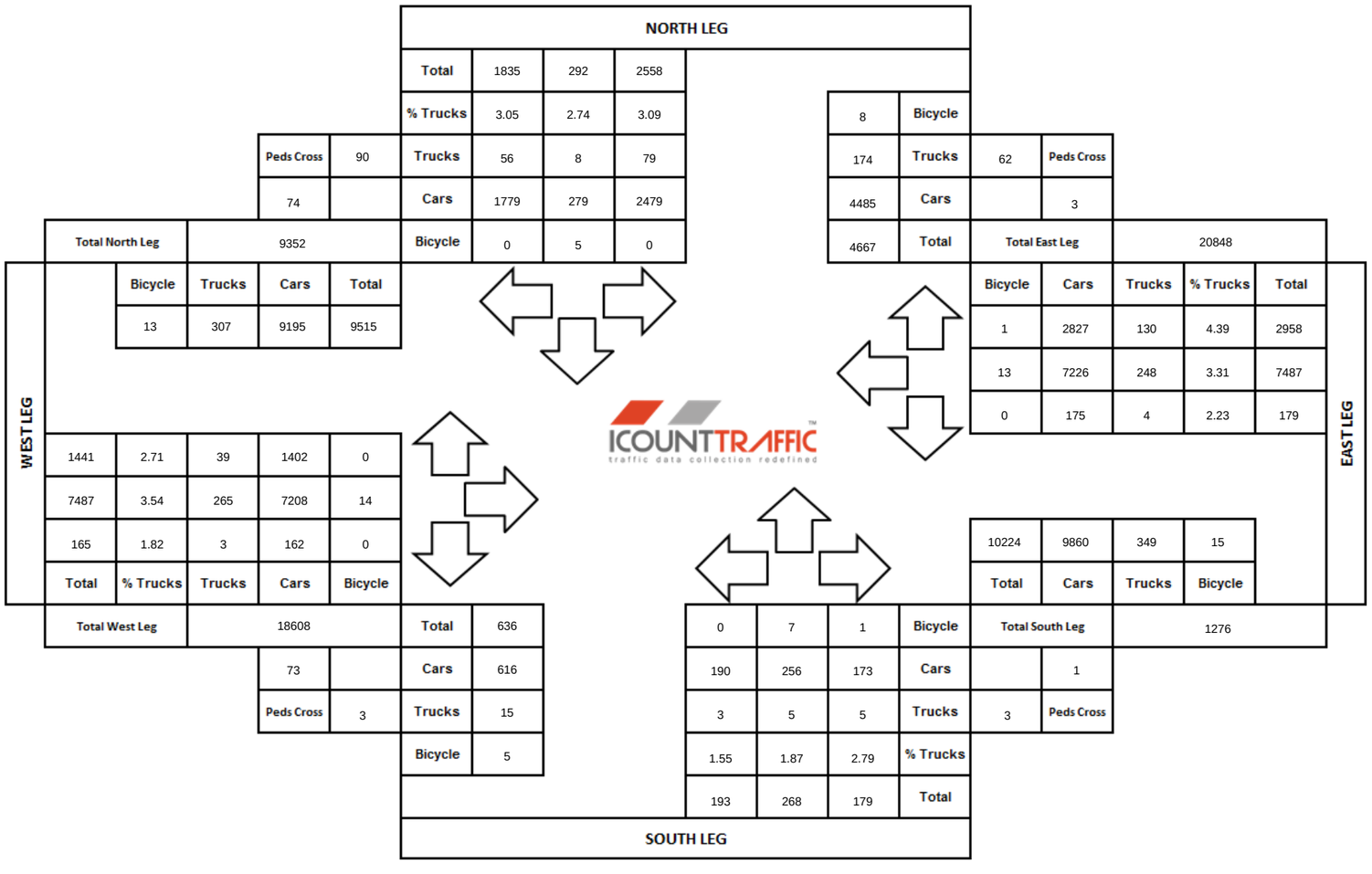
26/05/2015 17:15:00	0	1	1	0	2	2	1	1	2	0	0	0	5
26/05/2015 17:30:00	0	7	7	3	1	4	6	0	6	0	0	0	17
26/05/2015 17:45:00	0	4	4	1	4	5	4	0	4	0	0	0	13
Hourly Total	0	14	14	13	8	21	21	1	22	0	0	0	57
26/05/2015 18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0
26/05/2015 18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	31	31	37	18	55	51	3	54	1	0	1	141

PM Peak Hour 5:00 PM - 6:00 PM

Pedestrians	0	14	14	13	8	21	21	1	22	0	0	0	57

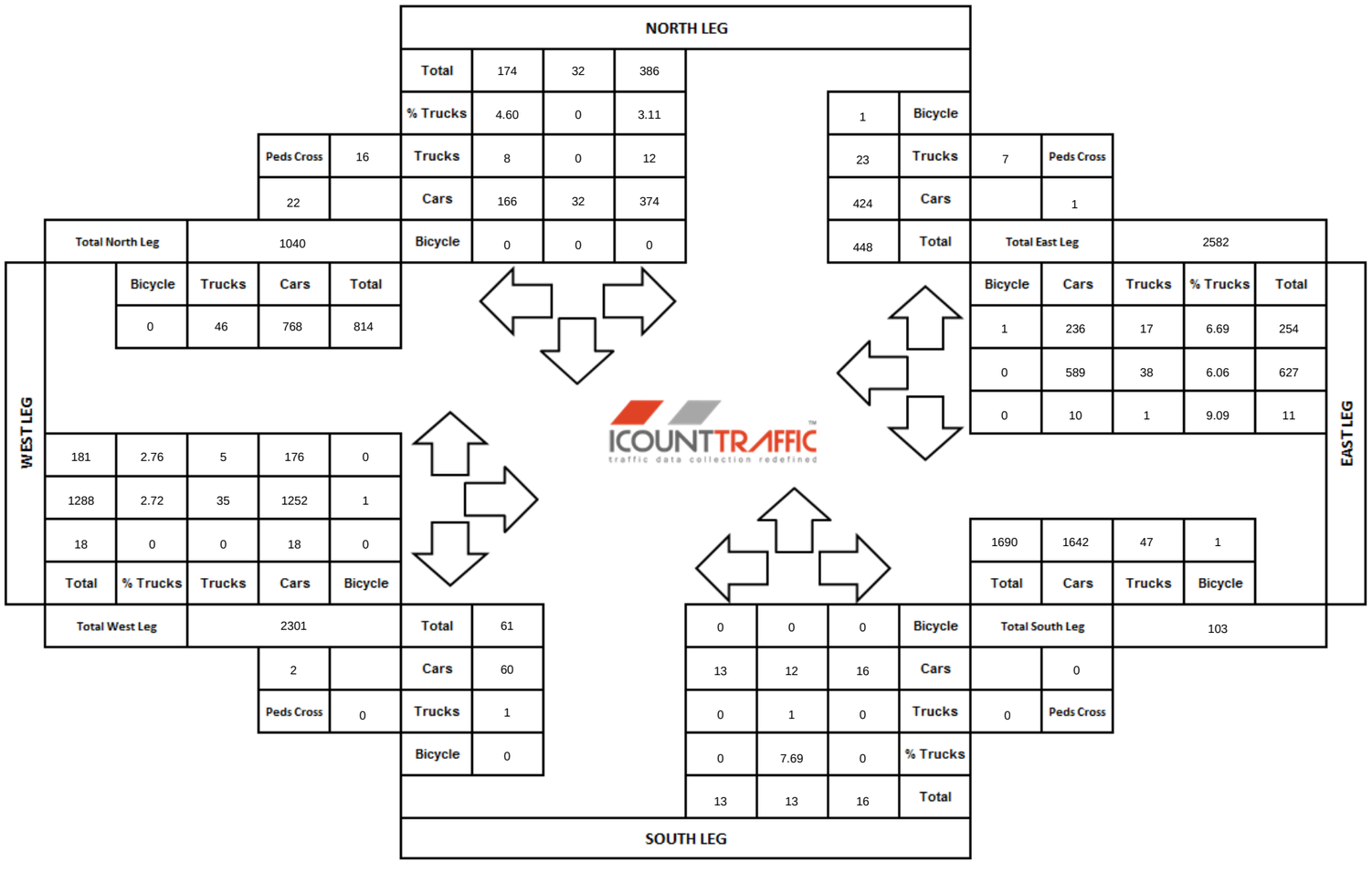
TOTAL TMC COUNT DIAGRAM

City:	**Mississauga**	**Weather:**	**Partly Cloudy**
North/South Street:	**Ramp to Cawthra Road**	**Count Date:**	**26/05/2015**
East/West Street:	**Dundas Street**	**Count Period:**	**AM, Noon, PM**
GPS Coordinates:	**43.593282, -79.601023**	**Peak Period:**	**8:00 AM - 9:00 AM, 12:15 PM - 1:15 PM, 5:00 PM - 6:00 PM**
Site Number:	**1703858**	**Major Road:**	**Ramp to Cawthra Road**
Control:	**Signalized**	**Surveyor:**	**Kevin Lagdameo**



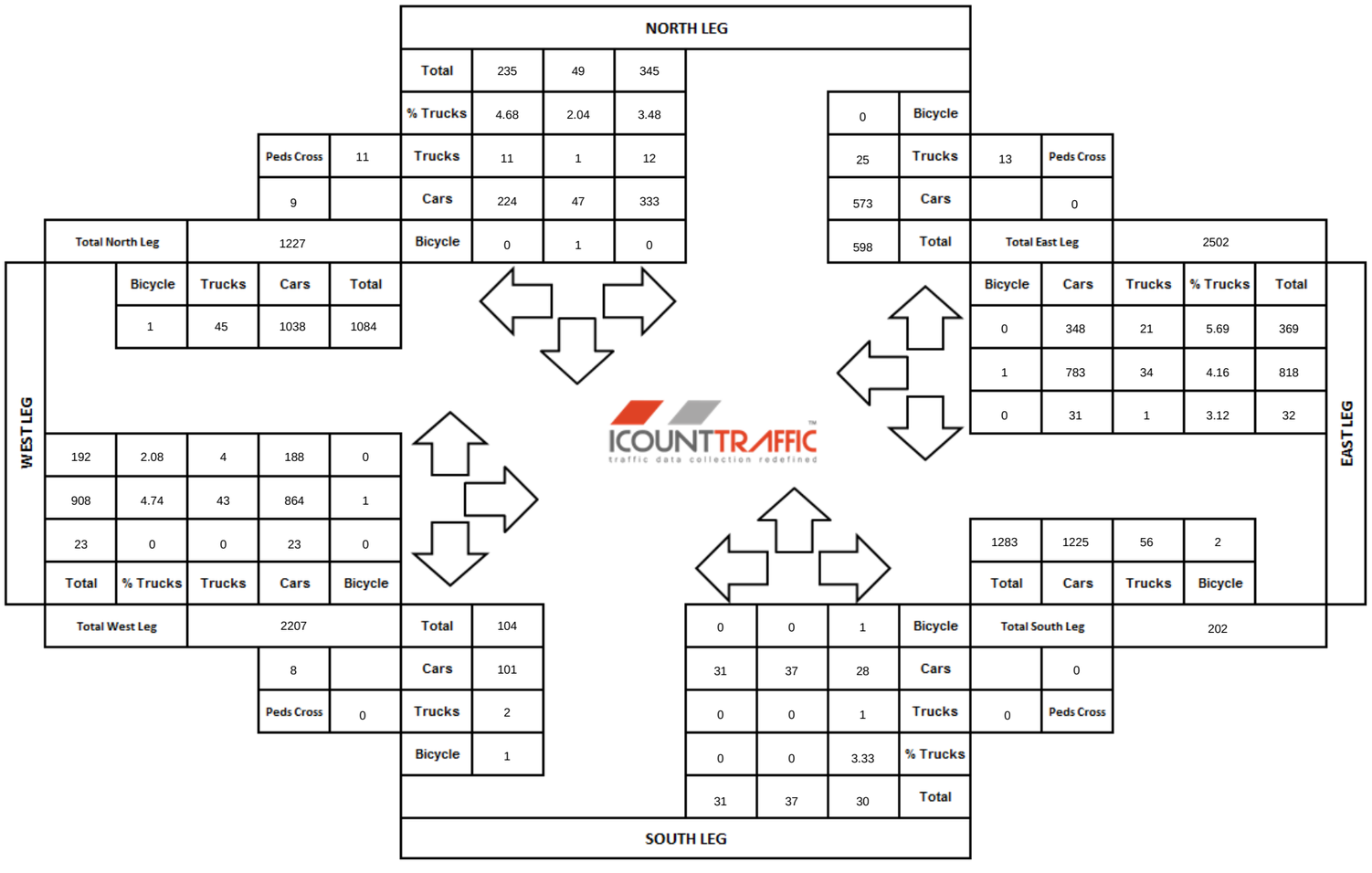
AM Peak Hour Count Diagram

City:	**Mississauga**	**Weather:**	**Partly Cloudy**
North/South Street:	**Ramp to Cawthra Road**	**Count Date:**	**26/05/2015**
East/West Street:	**Dundas Street**	**Count Period:**	**AM**
GPS Coordinates:	**43.593282, -79.601023**	**Peak Period:**	**8:00 AM - 9:00 AM**
Site Number:	**1703858**	**Major Road:**	**Ramp to Cawthra Road**
Control:	**Signalized**	**Surveyor:**	**Kevin Lagdameo**



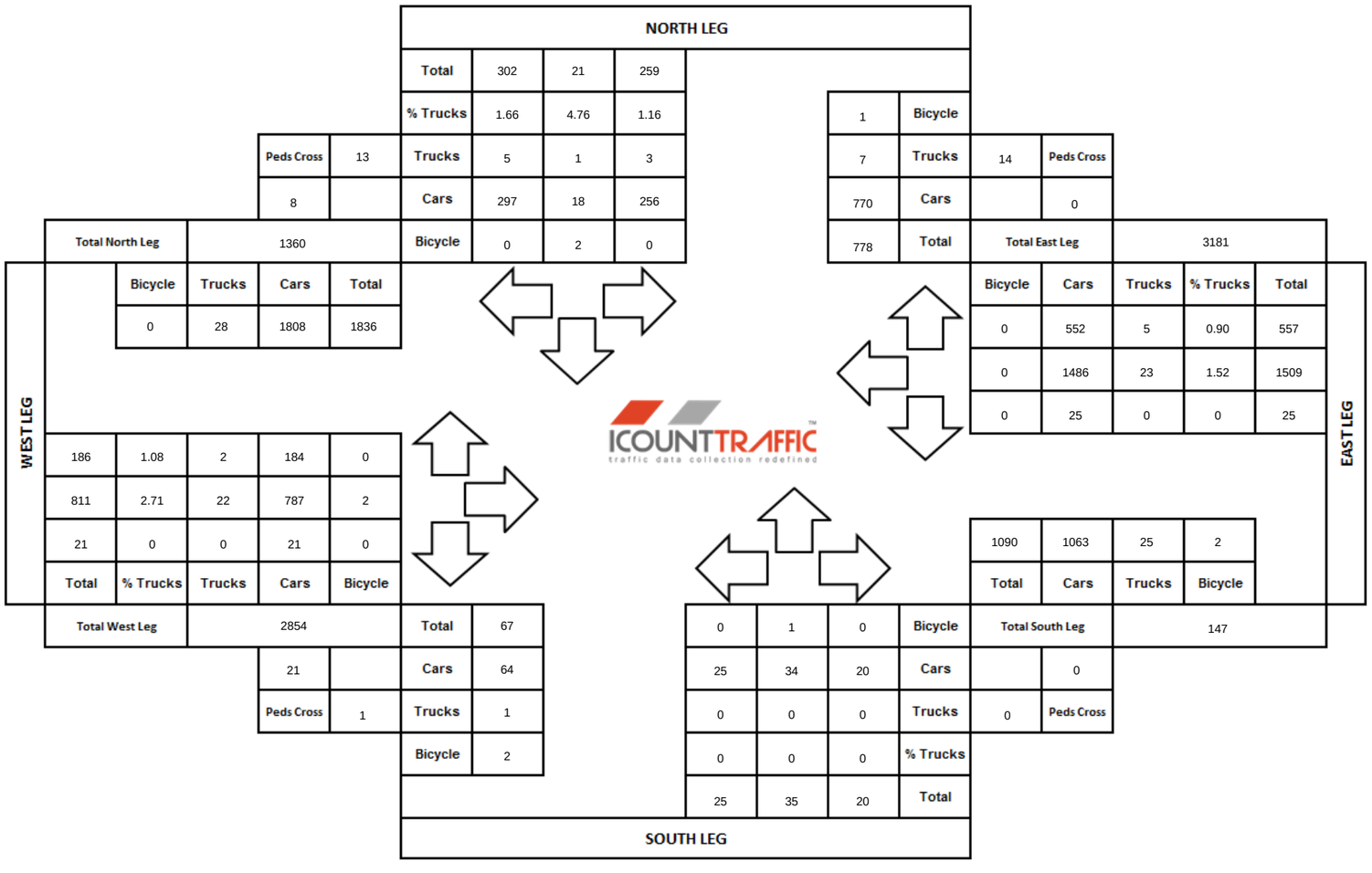
Noon Peak Hour Count Diagram

City:	**Mississauga**	**Weather:**	**Partly Cloudy**
North/South Street:	**Ramp to Cawthra Road**	**Count Date:**	**26/05/2015**
East/West Street:	**Dundas Street**	**Count Period:**	**Noon**
GPS Coordinates:	**43.593282, -79.601023**	**Peak Period:**	**12:15 PM - 1:15 PM**
Site Number:	**1703858**	**Major Road:**	**Ramp to Cawthra Road**
Control:	**Signalized**	**Surveyor:**	**Kevin Lagdameo**



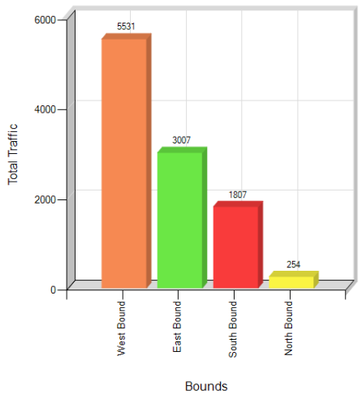
PM Peak Hour Count Diagram

City:	**Mississauga**	**Weather:**	**Partly Cloudy**
North/South Street:	**Ramp to Cawthra Road**	**Count Date:**	**26/05/2015**
East/West Street:	**Dundas Street**	**Count Period:**	**PM**
GPS Coordinates:	**43.593282, -79.601023**	**Peak Period:**	**5:00 PM - 6:00 PM**
Site Number:	**1703858**	**Major Road:**	**Ramp to Cawthra Road**
Control:	**Signalized**	**Surveyor:**	**Kevin Lagdameo**

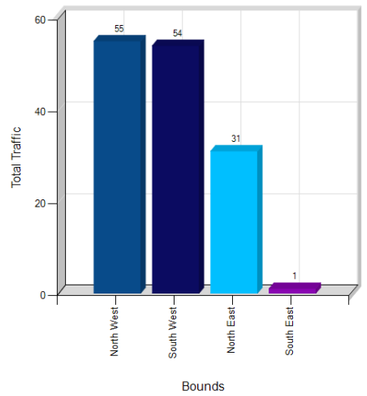


TMC chart data

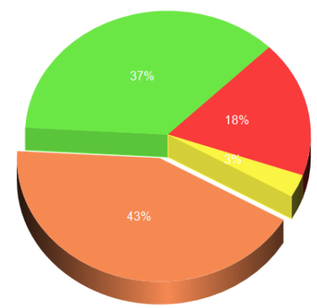
Total Traffic



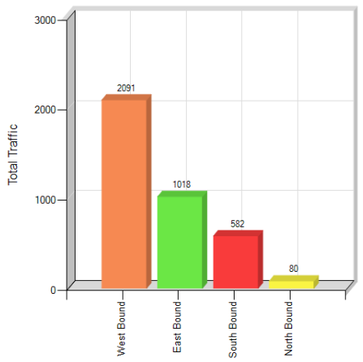
Total Pedestrians



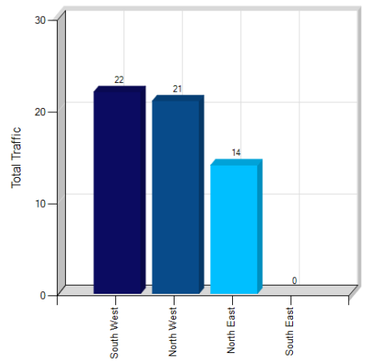
Total Approach



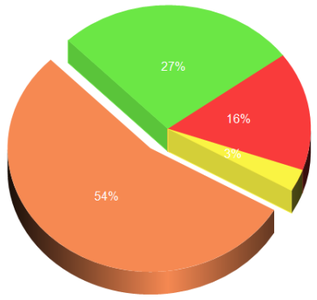
Total Traffic at Peak Hour



Total Pedestrians at Peak Hour



Total Approach at Peak Hour



	SouthBound		NorthEast
	WestBound		NorthWest
	NorthBound		SouthWest
	EastBound		SouthEast

NOTES & IMAGES

Dundas Street West Leg

Dundas Street East Leg

Ramp to Cawthra Road

Exit from Rona Plaza (South Leg)

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**June 8, 2022**		**Prepared Date**	**June 8, 2022**
Database Rev	**iNET**		**Completed By**	**TF**
Timing Card / Field rev	**-**		**Checked By**	**RC**

Location — **Dundas Street E Ramp at Cawthra Road (South Terminal)**

Phase #	Street Name - Direction	Vehicle Minimum (s)	Pedestrian Minimum (s)		Amber (s)	All Red (s)	TIME PERIOD (s)		
			WALK	FDWALK			AM SPLITS	OFF SPLITS	PM SPLITS
1	Dundas Street - EB P.P. LT	5.0	0.0	0.0	3.0	0.0	35.0	19.0	14.0
2	Dundas Street - EB / WB	8.0	10.0	19.0	4.0	3.0	69.0	58.0	87.0
3	Cawthra Road - NB	8.0	0.0	0.0	4.0	3.0	26.0	42.0	27.0
4	Cawthra Road - SB	8.0	10.0	29.0	4.0	3.5	30.0	41.0	32.0
5	Not In Use	-	-	-	-	-	-	-	-
6	Not In Use	-	-	-	-	-	-	-	-
7	Not In Use	-	-	-	-	-	-	-	-
8	Not In Use	-	-	-	-	-	-	-	-

System Control
Yes

Semi-Actuated Mode
Yes

TIME (M-F)	PEAK	CYCLE LENGTH (s)	OFFSET (s)
06:00-09:30	AM	160	85
09:30-15:00 19:30-00:00	OFF	160	22
15:00-19:30	PM	160	14

APPENDIX F:

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 G:

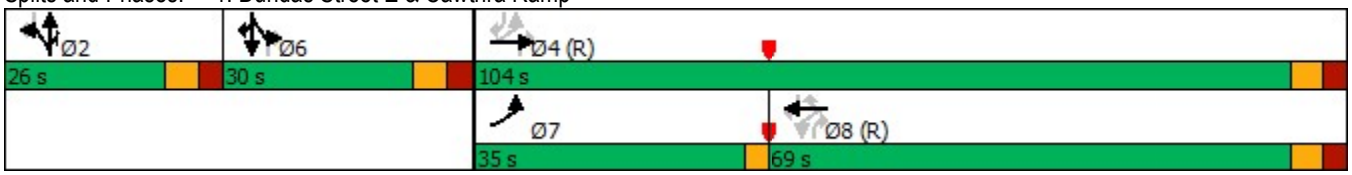
2022 Existing Detailed Capacity Analyses

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	1333	18	11	649	263	13	13	16	399	33	180
Future Volume (vph)	187	1333	18	11	649	263	13	13	16	399	33	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0		0.0	120.0		45.0	0.0		0.0	0.0		65.0
Storage Lanes	1		0	1		1	0		1	1		1
Taper Length (m)	100.0			15.0			7.6			100.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.998				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.976		0.950	0.959	
Satd. Flow (prot)	1789	3571	0	1789	5142	1601	0	1838	1601	1700	1716	1601
Flt Permitted	0.334			0.131				0.976		0.950	0.959	
Satd. Flow (perm)	629	3571	0	247	5142	1601	0	1838	1601	1700	1716	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				282						
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		121.4			559.2			44.8			197.1	
Travel Time (s)		7.3			33.6			3.4			14.2	
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
Adj. Flow (vph)	203	1449	20	12	705	286	14	14	17	434	36	196
Shared Lane Traffic (%)										46%		
Lane Group Flow (vph)	203	1469	0	12	705	286	0	28	17	234	236	196
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	custom	Split	NA	custom
Protected Phases	7	4			8		2	2	2	6	6	6
Permitted Phases	4			8		8			4 6 8			4 2 8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	36.0		36.0	36.0	36.0	15.0	15.0	15.0	15.5	15.5	15.5
Total Split (s)	35.0	104.0		69.0	69.0	69.0	26.0	26.0	26.0	30.0	30.0	30.0
Total Split (%)	21.9%	65.0%		43.1%	43.1%	43.1%	16.3%	16.3%	16.3%	18.8%	18.8%	18.8%
Maximum Green (s)	32.0	97.0		62.0	62.0	62.0	19.0	19.0	19.0	22.5	22.5	22.5
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		7.0	7.0	7.0		7.0	7.0	7.5	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0				0.0	0.0	0.0
Flash Dont Walk (s)		19.0		19.0	19.0	19.0				22.5	22.5	22.5
Pedestrian Calls (#/hr)		0		0	0	0				0	0	0
Act Effct Green (s)	104.9	100.9		85.0	85.0	85.0		8.7	160.0	31.9	31.9	160.0
Actuated g/C Ratio	0.66	0.63		0.53	0.53	0.53		0.05	1.00	0.20	0.20	1.00
v/c Ratio	0.40	0.65		0.09	0.26	0.29		0.28	0.01	0.69	0.69	0.12
Control Delay	14.7	21.8		32.3	30.8	11.3		79.6	0.0	70.2	70.1	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	21.8		32.3	30.8	11.3		79.6	0.0	70.2	70.1	0.2
LOS	B	C		C	C	B		E	A	E	E	A
Approach Delay		21.0			25.3			49.5			49.6	
Approach LOS		C			C			D			D	

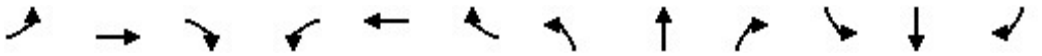
Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 16 (10%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 28.2		Intersection LOS: C	
Intersection Capacity Utilization 80.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Dundas Street E & Cawthra Ramp



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	203	1469	12	705	286	28	17	234	236	196
v/c Ratio	0.40	0.65	0.09	0.26	0.29	0.28	0.01	0.69	0.69	0.12
Control Delay	14.7	21.8	32.3	30.8	11.3	79.6	0.0	70.2	70.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	21.8	32.3	30.8	11.3	79.6	0.0	70.2	70.1	0.2
Queue Length 50th (m)	25.1	154.6	2.6	62.0	22.9	8.8	0.0	73.3	74.0	0.0
Queue Length 95th (m)	42.7	204.1	6.5	57.3	11.5	19.4	0.0	100.8	101.3	0.0
Internal Link Dist (m)		97.4		535.2		20.8			173.1	
Turn Bay Length (m)	75.0		120.0		45.0					65.0
Base Capacity (vph)	644	2291	131	2730	982	218	1601	338	341	1601
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	0.32	0.64	0.09	0.26	0.29	0.13	0.01	0.69	0.69	0.12

Intersection Summary

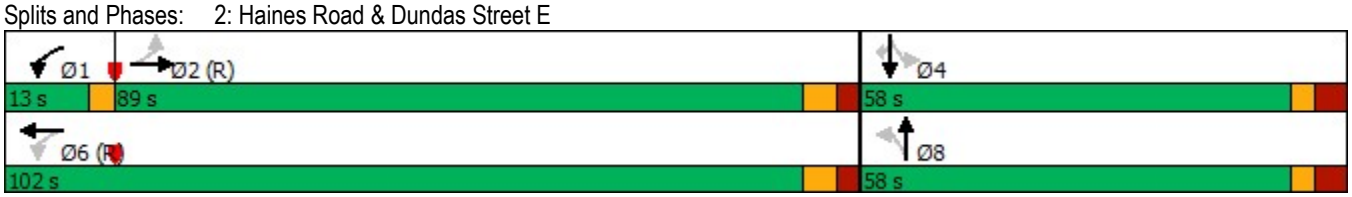


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1783	157	199	730	17	61	8	137	64	27	43
Future Volume (vph)	7	1783	157	199	730	17	61	8	137	64	27	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.997			0.859				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5080	0	1789	5126	0	1789	1618	0	1789	1883	1601
Flt Permitted	0.334			0.049			0.738			0.374		
Satd. Flow (perm)	629	5080	0	92	5126	0	1390	1618	0	704	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			4			124				48
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	8	1938	171	216	793	18	66	9	149	70	29	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	2109	0	216	811	0	66	158	0	70	29	47
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		53.0	53.0	53.0
Total Split (s)	89.0	89.0		13.0	102.0		58.0	58.0		58.0	58.0	58.0
Total Split (%)	55.6%	55.6%		8.1%	63.8%		36.3%	36.3%		36.3%	36.3%	36.3%
Maximum Green (s)	82.0	82.0		10.0	95.0		51.0	51.0		51.0	51.0	51.0
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		6.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0		36.0	36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)	98.6	98.6		134.9	130.9		15.1	15.1		16.1	15.1	15.1
Actuated g/C Ratio	0.62	0.62		0.84	0.82		0.09	0.09		0.10	0.09	0.09
v/c Ratio	0.02	0.67		0.56	0.19		0.50	0.60		0.99	0.16	0.24
Control Delay	8.0	16.9		55.6	3.0		80.5	27.0		174.5	65.9	17.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	8.0	16.9		55.6	3.0		80.5	27.0		174.5	65.9	17.9
LOS	A	B		E	A		F	C		F	E	B
Approach Delay		16.8			14.1			42.8			102.5	
Approach LOS		B			B			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 84.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Haines Road & Dundas Street E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	8	2109	216	811	66	158	70	29	47
v/c Ratio	0.02	0.67	0.56	0.19	0.50	0.60	0.99	0.16	0.24
Control Delay	8.0	16.9	55.6	3.0	80.5	27.0	174.5	65.9	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	16.9	55.6	3.0	80.5	27.0	174.5	65.9	17.9
Queue Length 50th (m)	0.7	191.5	50.3	14.0	20.3	10.2	22.6	8.6	0.0
Queue Length 95th (m)	m1.2	96.7	79.5	22.7	35.2	32.6	#46.6	18.4	12.0
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	387	3134	388	4193	443	600	228	600	543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.67	0.56	0.19	0.15	0.26	0.31	0.05	0.09

Intersection Summary

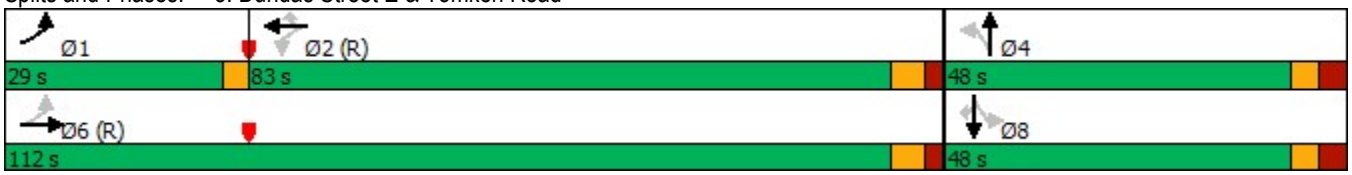
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

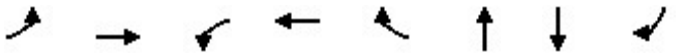
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	269	1592	7	6	622	203	3	4	16	319	10	256
Future Volume (vph)	269	1592	7	6	622	203	3	4	16	319	10	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.904				0.850
Flt Protected	0.950			0.950				0.994			0.954	
Satd. Flow (prot)	1789	5137	0	1789	5142	1601	0	1692	0	0	1797	1601
Flt Permitted	0.349			0.119				0.957			0.715	
Satd. Flow (perm)	657	5137	0	224	5142	1601	0	1629	0	0	1347	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				190		17				258
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	292	1730	8	7	676	221	3	4	17	347	11	278
Shared Lane Traffic (%)												
Lane Group Flow (vph)	292	1738	0	7	676	221	0	24	0	0	358	278
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	29.0	112.0		83.0	83.0	83.0	48.0	48.0		48.0	48.0	48.0
Total Split (%)	18.1%	70.0%		51.9%	51.9%	51.9%	30.0%	30.0%		30.0%	30.0%	30.0%
Maximum Green (s)	26.0	105.5		76.5	76.5	76.5	41.0	41.0		41.0	41.0	41.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			-2.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			5.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	109.0	105.5		87.0	87.0	87.0		41.0			43.0	41.0
Actuated g/C Ratio	0.68	0.66		0.54	0.54	0.54		0.26			0.27	0.26
v/c Ratio	0.52	0.51		0.06	0.24	0.23		0.06			0.99	0.46
Control Delay	10.7	9.4		20.5	19.8	4.4		22.8			101.8	9.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	10.7	9.4		20.5	19.8	4.4		22.8			101.8	9.5
LOS	B	A		C	B	A		C			F	A
Approach Delay		9.6			16.0			22.8			61.5	
Approach LOS		A			B			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 20.5		Intersection LOS: C	
Intersection Capacity Utilization 77.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Dundas Street E & Tomken Road





Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	292	1738	7	676	221	24	358	278
v/c Ratio	0.52	0.51	0.06	0.24	0.23	0.06	0.99	0.46
Control Delay	10.7	9.4	20.5	19.8	4.4	22.8	101.8	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	9.4	20.5	19.8	4.4	22.8	101.8	9.5
Queue Length 50th (m)	15.6	38.1	1.0	40.2	4.5	1.7	114.3	4.8
Queue Length 95th (m)	36.9	74.1	4.3	51.6	18.3	9.5	#180.5	29.5
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	631	3387	121	2795	957	430	362	602
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.51	0.06	0.24	0.23	0.06	0.99	0.46

Intersection Summary

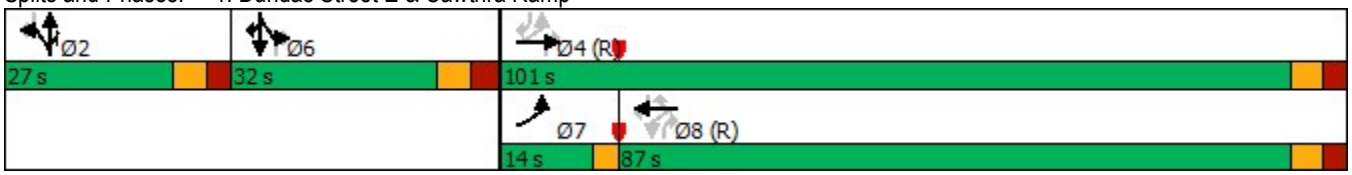
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	839	21	25	1562	576	36	20	82	268	21	312
Future Volume (vph)	192	839	21	25	1562	576	36	20	82	268	21	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0		0.0	120.0		45.0	0.0		0.0	0.0		65.0
Storage Lanes	1		0	1		1	0		1	1		1
Taper Length (m)	100.0			15.0			7.6			100.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.996				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.969		0.950	0.959	
Satd. Flow (prot)	1789	3564	0	1789	5142	1601	0	1825	1601	1700	1716	1601
Flt Permitted	0.077			0.306				0.969		0.950	0.959	
Satd. Flow (perm)	145	3564	0	576	5142	1601	0	1825	1601	1700	1716	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				313						
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		121.4			559.2			44.8			197.1	
Travel Time (s)		7.3			33.6			3.4			14.2	
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
Adj. Flow (vph)	209	912	23	27	1698	626	39	22	89	291	23	339
Shared Lane Traffic (%)										46%		
Lane Group Flow (vph)	209	935	0	27	1698	626	0	61	89	157	157	339
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	custom	Split	NA	custom
Protected Phases	7	4			8		2	2	2	6	6	6
Permitted Phases	4			8		8			4 6 8			4 2 8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	36.0		36.0	36.0	36.0	15.0	15.0	15.0	15.5	15.5	15.5
Total Split (s)	14.0	101.0		87.0	87.0	87.0	27.0	27.0	27.0	32.0	32.0	32.0
Total Split (%)	8.8%	63.1%		54.4%	54.4%	54.4%	16.9%	16.9%	16.9%	20.0%	20.0%	20.0%
Maximum Green (s)	11.0	94.0		80.0	80.0	80.0	20.0	20.0	20.0	24.5	24.5	24.5
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		7.0	7.0	7.0		7.0	7.0	7.5	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0				0.0	0.0	0.0
Flash Dont Walk (s)		19.0		19.0	19.0	19.0				22.5	22.5	22.5
Pedestrian Calls (#/hr)		0		0	0	0				0	0	0
Act Effct Green (s)	110.1	106.1		84.3	84.3	84.3		11.0	160.0	21.4	21.4	160.0
Actuated g/C Ratio	0.69	0.66		0.53	0.53	0.53		0.07	1.00	0.13	0.13	1.00
v/c Ratio	0.72	0.40		0.09	0.63	0.63		0.49	0.06	0.69	0.69	0.21
Control Delay	42.1	13.8		20.3	28.8	16.0		84.3	0.1	80.9	80.3	0.3
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	13.8		20.3	28.8	16.0		84.3	0.1	80.9	80.3	0.3
LOS	D	B		C	C	B		F	A	F	F	A
Approach Delay		19.0			25.3			34.3			38.9	
Approach LOS		B			C			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 16 (10%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 26.0		Intersection LOS: C	
Intersection Capacity Utilization 74.1%		ICU Level of Service D	
Analysis Period (min) 15			

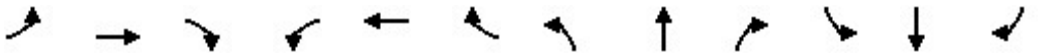
Splits and Phases: 1: Dundas Street E & Cawthra Ramp



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	209	935	27	1698	626	61	89	157	157	339
v/c Ratio	0.72	0.40	0.09	0.63	0.63	0.49	0.06	0.69	0.69	0.21
Control Delay	42.1	13.8	20.3	28.8	16.0	84.3	0.1	80.9	80.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	13.8	20.3	28.8	16.0	84.3	0.1	80.9	80.3	0.3
Queue Length 50th (m)	35.5	67.4	3.9	103.8	49.0	19.1	0.0	50.8	50.8	0.0
Queue Length 95th (m)	#98.7	99.8	m6.1	122.8	81.1	34.4	0.0	73.4	73.3	0.0
Internal Link Dist (m)		97.4		535.2		20.8			173.1	
Turn Bay Length (m)	75.0		120.0		45.0					65.0
Base Capacity (vph)	292	2364	303	2708	991	228	1597	271	273	1589
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	0.72	0.40	0.09	0.63	0.63	0.27	0.06	0.58	0.58	0.21

Intersection Summary

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

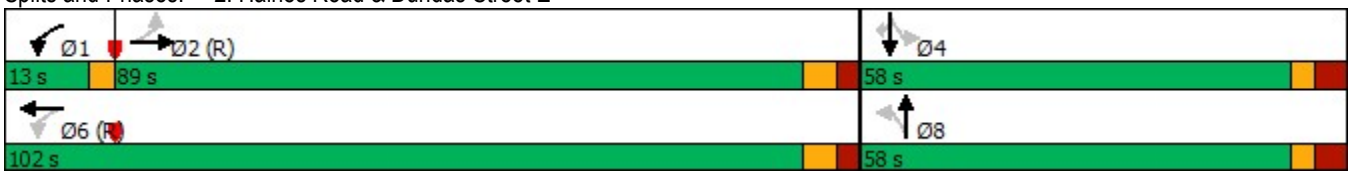


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1006	110	213	2073	28	172	3	242	41	9	35
Future Volume (vph)	22	1006	110	213	2073	28	172	3	242	41	9	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.998			0.852				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5065	0	1789	5132	0	1789	1605	0	1789	1883	1601
Flt Permitted	0.061			0.190			0.751			0.255		
Satd. Flow (perm)	115	5065	0	358	5132	0	1414	1605	0	480	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			2			175				48
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	24	1093	120	232	2253	30	187	3	263	45	10	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	1213	0	232	2283	0	187	266	0	45	10	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		53.0	53.0	53.0
Total Split (s)	89.0	89.0		13.0	102.0		58.0	58.0		58.0	58.0	58.0
Total Split (%)	55.6%	55.6%		8.1%	63.8%		36.3%	36.3%		36.3%	36.3%	36.3%
Maximum Green (s)	82.0	82.0		10.0	95.0		51.0	51.0		51.0	51.0	51.0
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		6.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0		36.0	36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)	103.5	103.5		122.9	118.9		27.1	27.1		28.1	27.1	27.1
Actuated g/C Ratio	0.65	0.65		0.77	0.74		0.17	0.17		0.18	0.17	0.17
v/c Ratio	0.32	0.37		0.60	0.60		0.78	0.64		0.54	0.03	0.12
Control Delay	22.8	8.8		26.2	7.2		84.6	27.1		81.0	51.1	9.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.8	8.8		26.2	7.2		84.6	27.1		81.0	51.1	9.0
LOS	C	A		C	A		F	C		F	D	A
Approach Delay		9.1			8.9			50.8			48.4	
Approach LOS		A			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 91.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Haines Road & Dundas Street E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	24	1213	232	2283	187	266	45	10	38
v/c Ratio	0.32	0.37	0.60	0.60	0.78	0.64	0.54	0.03	0.12
Control Delay	22.8	8.8	26.2	7.2	84.6	27.1	81.0	51.1	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	8.8	26.2	7.2	84.6	27.1	81.0	51.1	9.0
Queue Length 50th (m)	1.9	33.6	23.6	57.3	57.9	26.6	13.2	2.7	0.0
Queue Length 95th (m)	m8.4	39.2	52.8	72.1	80.5	53.8	26.0	8.0	7.3
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	74	3281	388	3814	450	630	156	600	543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.37	0.60	0.60	0.42	0.42	0.29	0.02	0.07

Intersection Summary

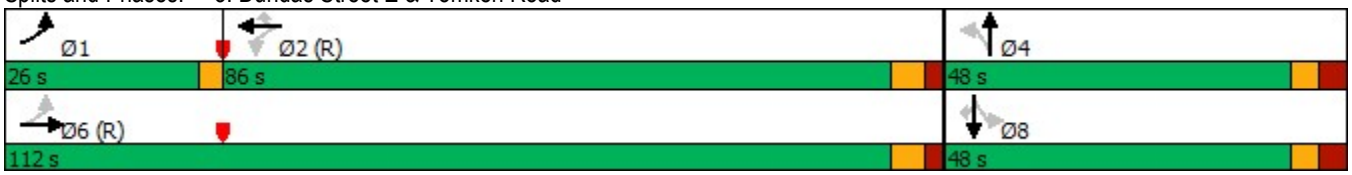
m Volume for 95th percentile queue is metered by upstream signal.

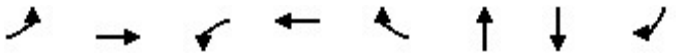
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	282	1111	45	32	1642	377	37	19	54	314	25	266
Future Volume (vph)	282	1111	45	32	1642	377	37	19	54	314	25	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.934				0.850
Flt Protected	0.950			0.950				0.984			0.956	
Satd. Flow (prot)	1789	5111	0	1789	5142	1601	0	1731	0	0	1801	1601
Flt Permitted	0.058			0.210				0.438			0.634	
Satd. Flow (perm)	109	5111	0	396	5142	1601	0	771	0	0	1194	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				139		29				251
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	307	1208	49	35	1785	410	40	21	59	341	27	289
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1257	0	35	1785	410	0	120	0	0	368	289
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	26.0	112.0		86.0	86.0	86.0	48.0	48.0		48.0	48.0	48.0
Total Split (%)	16.3%	70.0%		53.8%	53.8%	53.8%	30.0%	30.0%		30.0%	30.0%	30.0%
Maximum Green (s)	23.0	105.5		79.5	79.5	79.5	41.0	41.0		41.0	41.0	41.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	109.0	105.5		79.5	79.5	79.5		41.0			41.0	41.0
Actuated g/C Ratio	0.68	0.66		0.50	0.50	0.50		0.26			0.26	0.26
v/c Ratio	0.97	0.37		0.18	0.70	0.47		0.55			1.21	0.48
Control Delay	106.0	9.5		25.3	32.9	18.7		49.3			168.7	11.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	106.0	9.5		25.3	32.9	18.7		49.3			168.7	11.4
LOS	F	A		C	C	B		D			F	B
Approach Delay		28.5			30.2			49.3			99.5	
Approach LOS		C			C			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 40.0		Intersection LOS: D	
Intersection Capacity Utilization 87.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Dundas Street E & Tomken Road





Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	307	1257	35	1785	410	120	368	289
v/c Ratio	0.97	0.37	0.18	0.70	0.47	0.55	1.21	0.48
Control Delay	106.0	9.5	25.3	32.9	18.7	49.3	168.7	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.0	9.5	25.3	32.9	18.7	49.3	168.7	11.4
Queue Length 50th (m)	83.5	39.8	6.1	157.5	54.9	25.3	~141.7	9.3
Queue Length 95th (m)	#143.9	60.0	14.1	174.2	83.3	48.5	#206.2	36.2
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	315	3372	196	2554	865	219	305	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.37	0.18	0.70	0.47	0.55	1.21	0.48

Intersection Summary

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

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

APPENDIX H:

Dundas Connects Master Plan Excerpts

DUNDASCONNECTS

Dundas Connects Master Plan

MAY 24, 2018

2.6 CORRIDOR DESIGN

The implementation of the BRT along the Dundas Street corridor represents a large investment in transit infrastructure. As a result of this investment, there will be a shift in demand for different modes of transportation, providing an opportunity to transform Dundas Street from an auto-centric roadway into a complete street suitable for all users. General corridor-wide issues and opportunities regarding corridor design are depicted in Figure 2-46.

Legend

- Transit Routes
- Hydro Underground
- Hydro Aboveground
- Potential Connections to Open Space
- Potential Connections to Transit Hubs
- Grade Separation
- Main Intersections
- Signalized Intersections
- Transit Stops
- Views
- Flood Hazard Areas
- Focus Area Boundary
- Parks and Open Space

SEGMENTS

A	B	C
FROM NINTH LINE TO WINSTON CHURCHILL BOULEVARD	FROM WINSTON CHURCHILL BOULEVARD TO MISSISSAUGA ROAD	FROM MISSISSAUGA ROAD TO ERINDALE STATION

NUMBER OF LANES

6 LANES	4 LANES

OFFICIAL PLAN DESIGNATED RIGHT-OF-WAY

42m	35m	30m

EXISTING PUBLICLY OWNED RIGHT-OF-WAY

Generally 40m	Varies 25-38m

Opportunities:
- Create new cycling infrastructure that connects with existing bike lane on Ninth Line, south of Dundas Street
- Opportunity for gateway development
- Proximity to highway

Constraints:
- Poor cycling infrastructure
- Lack of greening on streets
- Highway 403 interchange

Opportunities:
- Create new cycling infrastructure that connects with existing bike lane on Fifth Line, south and north of Dundas Street
- Create more direct connections from neighbourhoods to Dundas Street
- Regional infrastructure along Erin Mills Parkway for cycling

Constraints:
- Poor connections between neighbourhoods and open spaces
- Lack of greening on streets

Opportunities:
- Potential to connect new cycling infrastructure to existing trails on the north
- Strengthen pedestrian environment
- Provide view corridors to open space
- Strengthen connection and service to UTM
- Opportunity for new signalized access to Erindale Park off Dundas Street

Constraints:
- Traffic congestion due to lack of alternate river crossings
- Poor connections to open spaces from Dundas Street (Carriage Way)
- Space constant on bridge crossing Credit River
- Lack of greening on streets

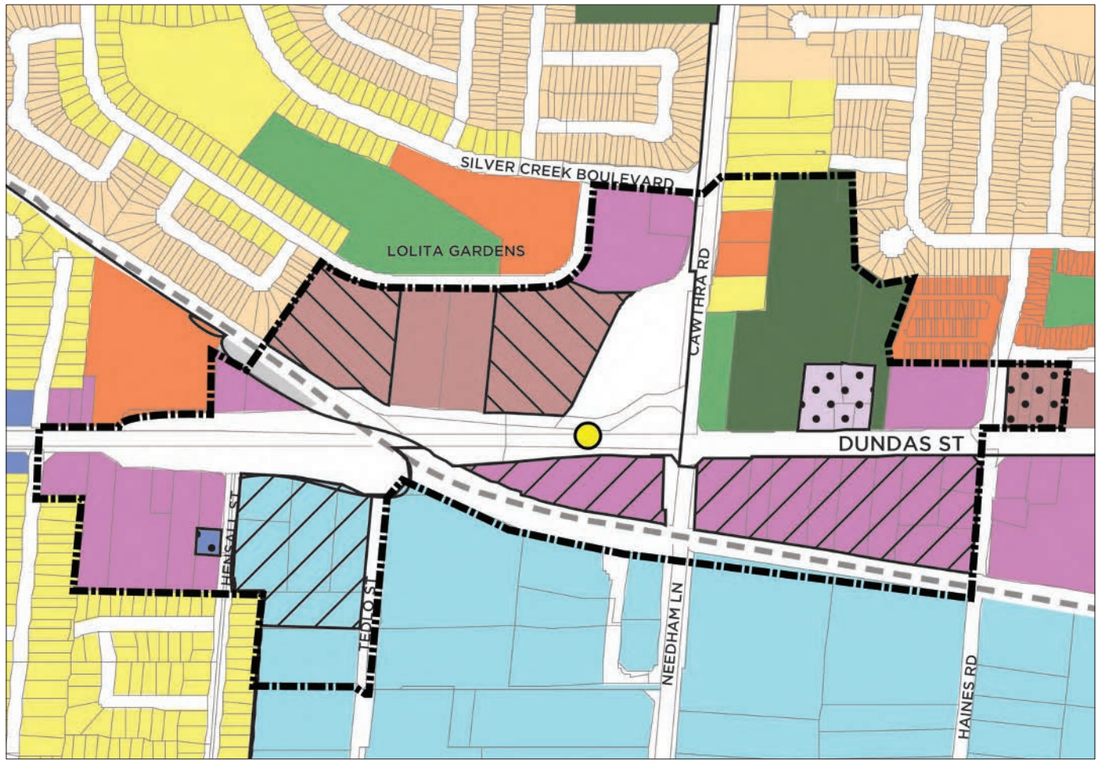


Figure 5-10. Cawthra Focus Area Proposed Uses Overlayed on Mississauga Official Plan Schedule 10 (2017 Consolidation)

Legend

Land Use Designations
- Residential Low Density I
- Residential Low Density II
- Residential Medium Density
- Residential High Density
- Mixed Use
- Convenience Commercial
- Motor Vehicle Commercial
- Office
- Business Employment
- Institutional
- Public Open Space
- Private Open Space
- Greenlands
- Parkway Belt West
- Utility
- Natural Hazard Area
- Focus Area Boundary
- Official Plan Character Area
- GO Rail
- Proposed BRT Stops

Proposed Land Uses
- Mix of Uses
- Employment Area Mixed Use
- Residential High Density Overlay

Figure 5-11. Cawthra Focus Area Framework Plan

- Focus Area Boundary
- Potential Redevelopment (Conceptual)
- Exisiting Green Space
- Natural Hazard

ACTIVE AT GRADE FRONTAGES:
- Retail Priority
- Mixed Use
- Office Priority

- GO Railway
- Main Road
- Existing Road
- Proposed Public Road
- Proposed Private Connection
- Existing Trail Network

- Proposed BRT Route and Stops
- Existing Signalized Intersection
- Potential Signalized Intersection (Conceptual)

- Potential Community Facility
- Potential Open Space
- Proposed Gateway/Connection to Trail
- Proposed Enhanced Boulevard

- Proposed BRT Stop

V. DUNDAS CONNECTS RECOMMENDATIONS

5.2.3 ACCOMMODATE BRT ON DUNDAS STREET BY RESPECTING CORRIDOR CHARACTERISTICS

Implementing BRT into an existing corridor requires context-sensitive planning and design. Given that the Dundas Street corridor is large and varied, segmenting sections of it will permit the development of a BRT solution that satisfies the unique characteristics of the corridor. The following subsections discuss the needs of each segment. The following subsections discuss the needs of each segment shown in Figure 5-42.

5.2.3.1 WEST SEGMENT – HIGHWAY 403 TO MISSISSAUGA ROAD

For much of this segment, existing infrastructure can easily be converted or reconfigured to accommodate transit infrastructure needs. The majority of the existing road consists of six general purpose lanes, and will be widened in those areas with fewer. BRT lanes in this segment will be curbside, as much of the area features stable residential development, which limits demand for median-running BRT. The planned configuration will protect sufficient space to permit reconfiguration to median BRT in the future, should that change be warranted.

5.2.3.2 ERINDALE AREA, REVERSIBLE LANE CONFIGURATION

The City of Mississauga has an interest in minimizing impacts to the natural environment of the Credit River Valley, Erindale Park, and the cultural heritage sites close to the corridor. As such, context-sensitive design is necessary. A reversible lane in the median will respect right-of-way constraints and limit environmental impacts, while satisfying the vision of the Master Plan. The reversible lane will provide for BRT movement in a dedicated median guideway in the peak direction. This solution allows for peak-direction buses within this segment to bypass traffic congestion while maintaining a high level of transit service. Off-peak direction BRT service will remain in mixed traffic, as is the case at present.

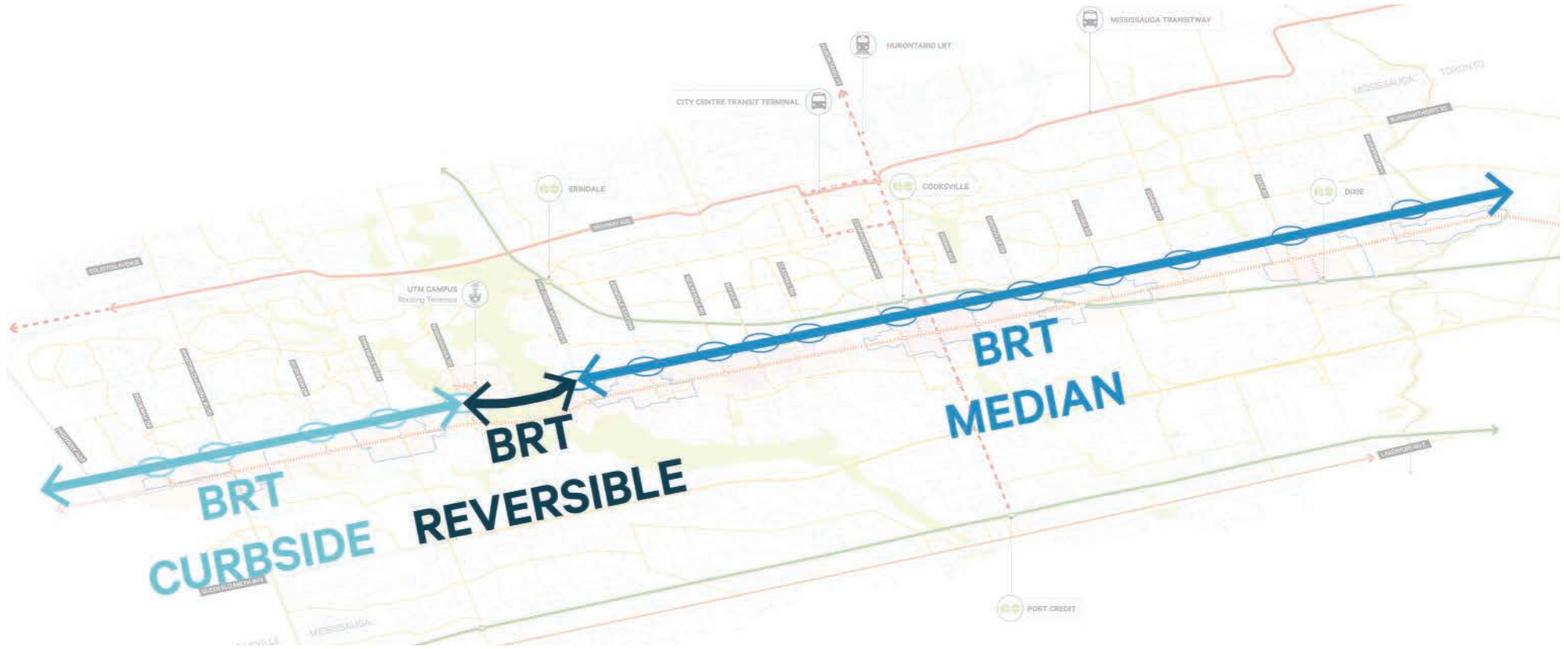


Figure 5-42. BRT Segments

The major origin/destination point in the segment is the University of Toronto at Mississauga (UTM) campus just north of the Dundas Street and Mississauga Road intersection. BRT service will be oriented to and from UTM. Because UTM is a significant trip generator, the intersection will also include a dedicated BRT southbound left-turn lane on Mississauga Road to facilitate turns into the reversible BRT lane. Movement operations are illustrated as in Figure 5-43.

Transition from the reversible lane to the two-way median BRT guideway will occur in the vicinity of The Credit Woodlands. The transition movement operations are illustrated in Figure 5-44.

Benefits of this context-sensitive solution include mitigated impacts to Erindale Park and the Erindale community, flexible bus operations, and maintaining the aesthetics of the area while providing a BRT solution.

5.2.3.3 EAST SEGMENT – THE CREDIT WOODLANDS TO ETOBICOKE CREEK

Median-running BRT is optimal in this segment due to higher built-form density, increased development opportunity, and potential connections to other transit facilities, including the Dixie and Cooksville GO Stations, and Hurontario LRT. As with the west segment, existing road infrastructure generally accommodates the six lanes required for median BRT implementation, though local widening will be required in some areas.

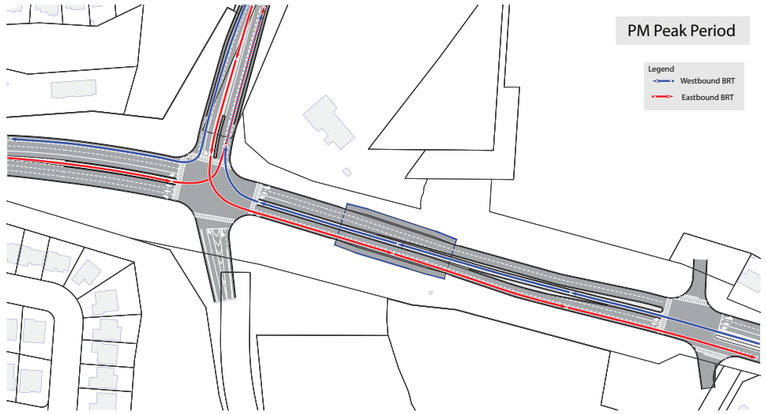


Figure 5-43. Mississauga Road reversible lane

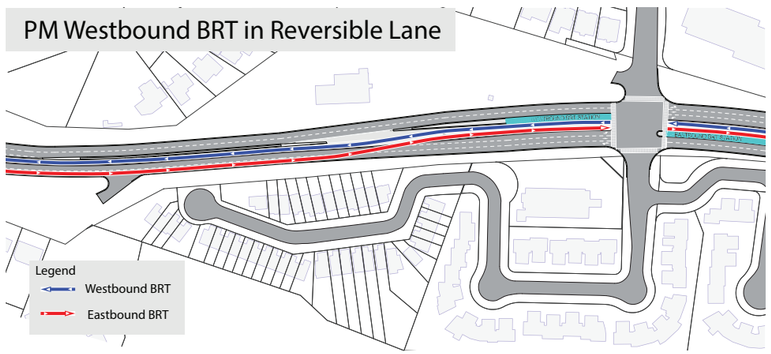


Figure 5-44. Reversible Lane Transition

5.2.3.4 COOKSVILLE

Though Cooksville is highly constrained, median BRT is nonetheless the appropriate solution for the area. Cooksville will shortly change, as Hurontario LRT and improvements to Cooksville GO Station are implemented. Widening the existing road in this segment allows for the existing general purpose lanes and access to properties along the corridor to be maintained.

Median BRT with three stations in Cooksville provides the following benefits:

- Facilitates transfers between the BRT and Hurontario LRT due to proximity of stations
- Flexible access to the BRT facility from the ring road
- Retains the existing four lanes of through traffic in the area

5.2.3.5 CAWTHRA ROAD AND DUNDAS STREET

This intersection has two features that significantly constrain any potential infrastructure improvements in the area. Those features are, firstly, the grade separation of the Canadian Pacific (CP) rail line at Cawthra Road, and secondly, the cemetery on the northeast corner. The cemetery is more significant as it limits the ability to widen the existing road platform.

Given these constraints, the recommended design maintains the existing form of grade separation at the CP rail and at Cawthra Road, since any major reconfiguration of the existing road, either in alignment or profile, would have significant impacts to the surrounding property and existing cemetery.

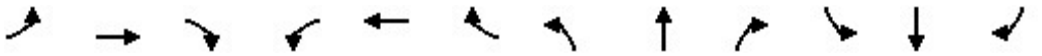
A median BRT station at the existing jug-handle intersection of Dundas Street and Cawthra Road is proposed, which will necessitate a wider Dundas Street overpass structure over Cawthra Road and the CP rail line.

Based on the City's biennial bridge inspection report,the Cawthra Road bridge is in good condition; however, since it is a solid slab bridge, widening the structure would be extremely difficult. Full replacement is recommended for the purpose of this Master Plan. The special planning and design considerations described in Section 5.2.5 include further discussion of this matter.

The CP rail bridge, in fair condition as per the City's biennial bridge-inspection report, is a slab-on-girder structure. As such, the bridge could be easily widened to accommodate the additional BRT lanes required west of the Cawthra Road and Dundas Street jug-handle intersection.

APPENDIX I:

2027 Future Background Detailed Capacity Analyses

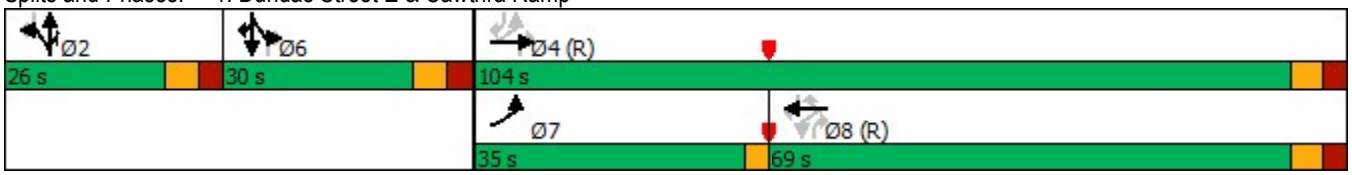


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1334	19	12	650	273	14	14	17	420	35	185
Future Volume (vph)	193	1334	19	12	650	273	14	14	17	420	35	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0		0.0	120.0		45.0	0.0		0.0	0.0		65.0
Storage Lanes	1		0	1		1	0		1	1		1
Taper Length (m)	100.0			15.0			7.6			100.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.998				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.976		0.950	0.959	
Satd. Flow (prot)	1789	3571	0	1789	5142	1601	0	1838	1601	1700	1716	1601
Flt Permitted	0.330			0.125				0.976		0.950	0.959	
Satd. Flow (perm)	622	3571	0	235	5142	1601	0	1838	1601	1700	1716	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				292						
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		121.4			559.2			44.8			197.1	
Travel Time (s)		7.3			33.6			3.4			14.2	
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
Adj. Flow (vph)	210	1450	21	13	707	297	15	15	18	457	38	201
Shared Lane Traffic (%)										46%		
Lane Group Flow (vph)	210	1471	0	13	707	297	0	30	18	247	248	201
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	custom	Split	NA	custom
Protected Phases	7	4			8		2	2	2	6	6	6
Permitted Phases	4			8		8			4 6 8			4 2 8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	36.0		36.0	36.0	36.0	15.0	15.0	15.0	15.5	15.5	15.5
Total Split (s)	35.0	104.0		69.0	69.0	69.0	26.0	26.0	26.0	30.0	30.0	30.0
Total Split (%)	21.9%	65.0%		43.1%	43.1%	43.1%	16.3%	16.3%	16.3%	18.8%	18.8%	18.8%
Maximum Green (s)	32.0	97.0		62.0	62.0	62.0	19.0	19.0	19.0	22.5	22.5	22.5
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		7.0	7.0	7.0		7.0	7.0	7.5	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0				0.0	0.0	0.0
Flash Dont Walk (s)		19.0		19.0	19.0	19.0				22.5	22.5	22.5
Pedestrian Calls (#/hr)		0		0	0	0				0	0	0
Act Effct Green (s)	102.3	98.3		81.8	81.8	81.8		8.8	160.0	34.4	34.4	160.0
Actuated g/C Ratio	0.64	0.61		0.51	0.51	0.51		0.06	1.00	0.22	0.22	1.00
v/c Ratio	0.42	0.67		0.11	0.27	0.31		0.30	0.01	0.68	0.67	0.13
Control Delay	15.7	23.3		33.2	31.8	11.0		80.0	0.0	67.7	67.4	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	23.3		33.2	31.8	11.0		80.0	0.0	67.7	67.4	0.2
LOS	B	C		C	C	B		F	A	E	E	A
Approach Delay		22.3			25.7			50.0			48.1	
Approach LOS		C			C			D			D	

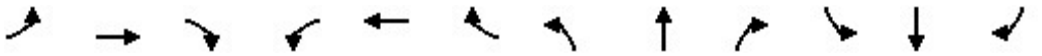
Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 16 (10%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 28.9		Intersection LOS: C	
Intersection Capacity Utilization 81.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Dundas Street E & Cawthra Ramp



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	1471	13	707	297	30	18	247	248	201
v/c Ratio	0.42	0.67	0.11	0.27	0.31	0.30	0.01	0.68	0.67	0.13
Control Delay	15.7	23.3	33.2	31.8	11.0	80.0	0.0	67.7	67.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	23.3	33.2	31.8	11.0	80.0	0.0	67.7	67.4	0.2
Queue Length 50th (m)	27.1	160.7	2.9	62.2	23.6	9.4	0.0	76.8	77.0	0.0
Queue Length 95th (m)	43.5	202.0	7.0	57.3	16.9	20.7	0.0	107.6	107.8	0.0
Internal Link Dist (m)		97.4		535.2		20.8			173.1	
Turn Bay Length (m)	75.0		120.0		45.0					65.0
Base Capacity (vph)	631	2245	120	2629	961	218	1601	365	368	1601
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	0.33	0.66	0.11	0.27	0.31	0.14	0.01	0.68	0.67	0.13

Intersection Summary

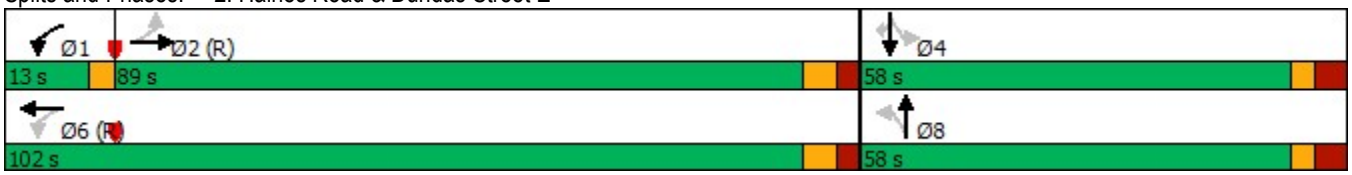


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	1820	159	201	746	52	63	9	141	79	28	55
Future Volume (vph)	54	1820	159	201	746	52	63	9	141	79	28	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.990			0.859				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5080	0	1789	5090	0	1789	1618	0	1789	1883	1601
Flt Permitted	0.315			0.043			0.738			0.401		
Satd. Flow (perm)	593	5080	0	81	5090	0	1390	1618	0	755	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			12			123				60
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	59	1978	173	218	811	57	68	10	153	86	30	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	2151	0	218	868	0	68	163	0	86	30	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		53.0	53.0	53.0
Total Split (s)	89.0	89.0		13.0	102.0		58.0	58.0		58.0	58.0	58.0
Total Split (%)	55.6%	55.6%		8.1%	63.8%		36.3%	36.3%		36.3%	36.3%	36.3%
Maximum Green (s)	82.0	82.0		10.0	95.0		51.0	51.0		51.0	51.0	51.0
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		6.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0		36.0	36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)	95.7	95.7		132.4	128.4		17.6	17.6		18.6	17.6	17.6
Actuated g/C Ratio	0.60	0.60		0.83	0.80		0.11	0.11		0.12	0.11	0.11
v/c Ratio	0.17	0.71		0.57	0.21		0.45	0.57		0.99	0.15	0.26
Control Delay	10.9	18.6		58.2	3.5		74.2	26.3		161.4	63.0	15.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.9	18.6		58.2	3.5		74.2	26.3		161.4	63.0	15.8
LOS	B	B		E	A		E	C		F	E	B
Approach Delay		18.4			14.5			40.4			95.0	
Approach LOS		B			B			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 22.3		Intersection LOS: C	
Intersection Capacity Utilization 85.7%		ICU Level of Service E	
Analysis Period (min) 15			

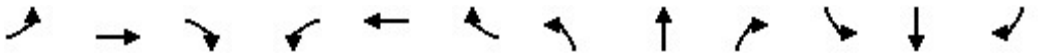
Splits and Phases: 2: Haines Road & Dundas Street E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	2151	218	868	68	163	86	30	60
v/c Ratio	0.17	0.71	0.57	0.21	0.45	0.57	0.99	0.15	0.26
Control Delay	10.9	18.6	58.2	3.5	74.2	26.3	161.4	63.0	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	18.6	58.2	3.5	74.2	26.3	161.4	63.0	15.8
Queue Length 50th (m)	5.2	199.3	52.7	16.7	20.6	11.8	27.8	8.8	0.0
Queue Length 95th (m)	m9.6	105.8	82.7	26.4	35.3	34.4	#52.2	18.5	13.4
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	354	3043	384	4088	443	599	245	600	551
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.71	0.57	0.21	0.15	0.27	0.35	0.05	0.11

Intersection Summary

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

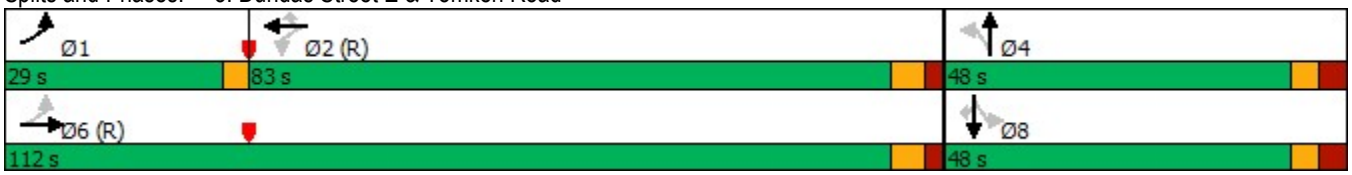


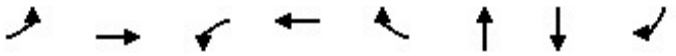
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	294	1625	8	7	635	222	4	6	17	326	11	262
Future Volume (vph)	294	1625	8	7	635	222	4	6	17	326	11	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.916				0.850
Flt Protected	0.950			0.950				0.993			0.954	
Satd. Flow (prot)	1789	5137	0	1789	5142	1601	0	1713	0	0	1797	1601
Flt Permitted	0.341			0.114				0.923			0.712	
Satd. Flow (perm)	642	5137	0	215	5142	1601	0	1592	0	0	1341	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				203		18				259
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	320	1766	9	8	690	241	4	7	18	354	12	285
Shared Lane Traffic (%)												
Lane Group Flow (vph)	320	1775	0	8	690	241	0	29	0	0	366	285
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	29.0	112.0		83.0	83.0	83.0	48.0	48.0		48.0	48.0	48.0
Total Split (%)	18.1%	70.0%		51.9%	51.9%	51.9%	30.0%	30.0%		30.0%	30.0%	30.0%
Maximum Green (s)	26.0	105.5		76.5	76.5	76.5	41.0	41.0		41.0	41.0	41.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			-2.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			5.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	109.0	105.5		85.8	85.8	85.8		41.0			43.0	41.0
Actuated g/C Ratio	0.68	0.66		0.54	0.54	0.54		0.26			0.27	0.26
v/c Ratio	0.57	0.52		0.07	0.25	0.25		0.07			1.02	0.47
Control Delay	14.7	9.4		21.6	20.5	4.8		24.3			108.2	10.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	14.7	9.4		21.6	20.5	4.8		24.3			108.2	10.1
LOS	B	A		C	C	A		C			F	B
Approach Delay		10.2			16.5			24.3			65.3	
Approach LOS		B			B			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 21.6		Intersection LOS: C	
Intersection Capacity Utilization 78.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Dundas Street E & Tomken Road



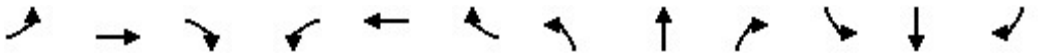


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	320	1775	8	690	241	29	366	285
v/c Ratio	0.57	0.52	0.07	0.25	0.25	0.07	1.02	0.47
Control Delay	14.7	9.4	21.6	20.5	4.8	24.3	108.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	9.4	21.6	20.5	4.8	24.3	108.2	10.1
Queue Length 50th (m)	18.3	42.2	1.2	41.9	5.6	2.7	~122.4	6.3
Queue Length 95th (m)	52.1	76.4	4.8	53.9	20.6	11.3	#187.0	31.9
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	623	3387	115	2756	952	421	360	602
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.52	0.07	0.25	0.25	0.07	1.02	0.47

Intersection Summary

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

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

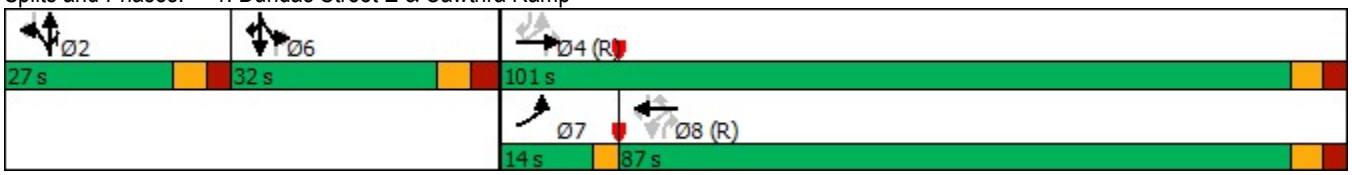


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	840	22	26	1563	598	37	21	83	278	23	320
Future Volume (vph)	197	840	22	26	1563	598	37	21	83	278	23	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0		0.0	120.0		45.0	0.0		0.0	0.0		65.0
Storage Lanes	1		0	1		1	0		1	1		1
Taper Length (m)	100.0			15.0			7.6			100.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.996				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.969		0.950	0.959	
Satd. Flow (prot)	1789	3564	0	1789	5142	1601	0	1825	1601	1700	1716	1601
Flt Permitted	0.075			0.305				0.969		0.950	0.959	
Satd. Flow (perm)	141	3564	0	574	5142	1601	0	1825	1601	1700	1716	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				325						
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		121.4			559.2			44.8			197.1	
Travel Time (s)		7.3			33.6			3.4			14.2	
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
Adj. Flow (vph)	214	913	24	28	1699	650	40	23	90	302	25	348
Shared Lane Traffic (%)										46%		
Lane Group Flow (vph)	214	937	0	28	1699	650	0	63	90	163	164	348
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	custom	Split	NA	custom
Protected Phases	7	4			8		2	2	2	6	6	6
Permitted Phases	4			8		8			4 6 8			4 2 8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	36.0		36.0	36.0	36.0	15.0	15.0	15.0	15.5	15.5	15.5
Total Split (s)	14.0	101.0		87.0	87.0	87.0	27.0	27.0	27.0	32.0	32.0	32.0
Total Split (%)	8.8%	63.1%		54.4%	54.4%	54.4%	16.9%	16.9%	16.9%	20.0%	20.0%	20.0%
Maximum Green (s)	11.0	94.0		80.0	80.0	80.0	20.0	20.0	20.0	24.5	24.5	24.5
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		7.0	7.0	7.0		7.0	7.0	7.5	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0				0.0	0.0	0.0
Flash Dont Walk (s)		19.0		19.0	19.0	19.0				22.5	22.5	22.5
Pedestrian Calls (#/hr)		0		0	0	0				0	0	0
Act Effct Green (s)	109.6	105.6		83.1	83.1	83.1		11.1	160.0	21.8	21.8	160.0
Actuated g/C Ratio	0.68	0.66		0.52	0.52	0.52		0.07	1.00	0.14	0.14	1.00
v/c Ratio	0.72	0.40		0.09	0.64	0.66		0.50	0.06	0.71	0.70	0.22
Control Delay	44.0	14.1		21.1	29.6	16.9		84.5	0.1	81.7	81.3	0.3
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	14.1		21.1	29.6	16.9		84.5	0.1	81.7	81.3	0.3
LOS	D	B		C	C	B		F	A	F	F	A
Approach Delay		19.6			26.0			34.8			39.6	
Approach LOS		B			C			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 16 (10%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 26.8		Intersection LOS: C	
Intersection Capacity Utilization 74.6%		ICU Level of Service D	
Analysis Period (min) 15			

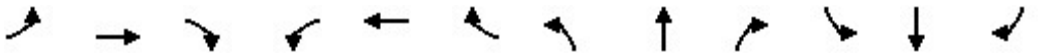
Splits and Phases: 1: Dundas Street E & Cawthra Ramp



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	214	937	28	1699	650	63	90	163	164	348
v/c Ratio	0.72	0.40	0.09	0.64	0.66	0.50	0.06	0.71	0.70	0.22
Control Delay	44.0	14.1	21.1	29.6	16.9	84.5	0.1	81.7	81.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	14.1	21.1	29.6	16.9	84.5	0.1	81.7	81.3	0.3
Queue Length 50th (m)	38.2	68.5	4.2	103.0	50.2	19.7	0.0	52.8	53.0	0.0
Queue Length 95th (m)	#103.5	100.0	m6.4	125.0	86.3	35.4	0.0	76.2	76.4	0.0
Internal Link Dist (m)		97.4		535.2		20.8			173.1	
Turn Bay Length (m)	75.0		120.0		45.0					65.0
Base Capacity (vph)	296	2352	298	2671	988	228	1597	272	274	1587
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	0.72	0.40	0.09	0.64	0.66	0.28	0.06	0.60	0.60	0.22

Intersection Summary

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

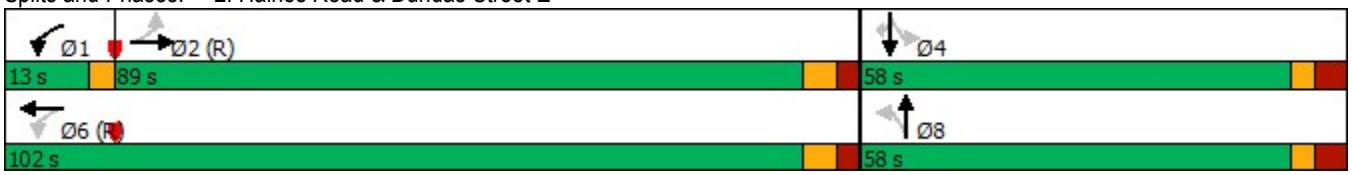


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1036	110	213	2124	28	172	3	242	41	9	35
Future Volume (vph)	22	1036	110	213	2124	28	172	3	242	41	9	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.998			0.852				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5070	0	1789	5132	0	1789	1605	0	1789	1883	1601
Flt Permitted	0.056			0.181			0.751			0.255		
Satd. Flow (perm)	105	5070	0	341	5132	0	1414	1605	0	480	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			2			170				48
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	24	1126	120	232	2309	30	187	3	263	45	10	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	1246	0	232	2339	0	187	266	0	45	10	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		53.0	53.0	53.0
Total Split (s)	89.0	89.0		13.0	102.0		58.0	58.0		58.0	58.0	58.0
Total Split (%)	55.6%	55.6%		8.1%	63.8%		36.3%	36.3%		36.3%	36.3%	36.3%
Maximum Green (s)	82.0	82.0		10.0	95.0		51.0	51.0		51.0	51.0	51.0
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		6.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0		36.0	36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)	103.0	103.0		122.9	118.9		27.1	27.1		28.1	27.1	27.1
Actuated g/C Ratio	0.64	0.64		0.77	0.74		0.17	0.17		0.18	0.17	0.17
v/c Ratio	0.36	0.38		0.61	0.61		0.78	0.64		0.54	0.03	0.12
Control Delay	26.4	9.0		28.0	7.3		84.6	28.3		81.0	51.1	9.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.4	9.0		28.0	7.3		84.6	28.3		81.0	51.1	9.0
LOS	C	A		C	A		F	C		F	D	A
Approach Delay		9.3			9.2			51.5			48.4	
Approach LOS		A			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 92.6%		ICU Level of Service F	
Analysis Period (min) 15			

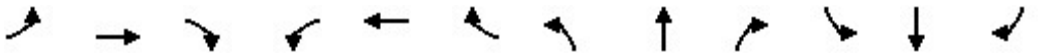
Splits and Phases: 2: Haines Road & Dundas Street E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	24	1246	232	2339	187	266	45	10	38
v/c Ratio	0.36	0.38	0.61	0.61	0.78	0.64	0.54	0.03	0.12
Control Delay	26.4	9.0	28.0	7.3	84.6	28.3	81.0	51.1	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	9.0	28.0	7.3	84.6	28.3	81.0	51.1	9.0
Queue Length 50th (m)	2.0	35.4	25.9	58.9	57.9	28.3	13.2	2.7	0.0
Queue Length 95th (m)	m8.5	40.0	55.6	73.7	80.5	55.5	26.0	8.0	7.3
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	67	3268	380	3814	450	627	156	600	543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.38	0.61	0.61	0.42	0.42	0.29	0.02	0.07

Intersection Summary

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

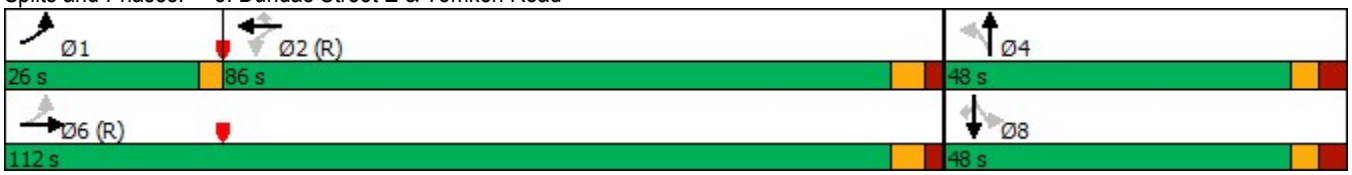


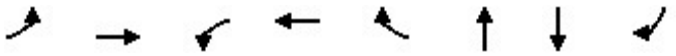
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	282	1134	45	35	1685	377	38	22	56	314	28	266
Future Volume (vph)	282	1134	45	35	1685	377	38	22	56	314	28	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.935				0.850
Flt Protected	0.950			0.950				0.984			0.956	
Satd. Flow (prot)	1789	5111	0	1789	5142	1601	0	1733	0	0	1801	1601
Flt Permitted	0.053			0.204				0.428			0.627	
Satd. Flow (perm)	100	5111	0	384	5142	1601	0	754	0	0	1181	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				135		28				250
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	307	1233	49	38	1832	410	41	24	61	341	30	289
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1282	0	38	1832	410	0	126	0	0	371	289
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	26.0	112.0		86.0	86.0	86.0	48.0	48.0		48.0	48.0	48.0
Total Split (%)	16.3%	70.0%		53.8%	53.8%	53.8%	30.0%	30.0%		30.0%	30.0%	30.0%
Maximum Green (s)	23.0	105.5		79.5	79.5	79.5	41.0	41.0		41.0	41.0	41.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	109.0	105.5		79.5	79.5	79.5		41.0			41.0	41.0
Actuated g/C Ratio	0.68	0.66		0.50	0.50	0.50		0.26			0.26	0.26
v/c Ratio	0.99	0.38		0.20	0.72	0.48		0.59			1.23	0.48
Control Delay	111.7	9.5		26.0	33.5	19.0		52.8			176.6	11.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	111.7	9.5		26.0	33.5	19.0		52.8			176.6	11.5
LOS	F	A		C	C	B		D			F	B
Approach Delay		29.2			30.7			52.8			104.3	
Approach LOS		C			C			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 41.3		Intersection LOS: D	
Intersection Capacity Utilization 88.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Dundas Street E & Tomken Road





Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	307	1282	38	1832	410	126	371	289
v/c Ratio	0.99	0.38	0.20	0.72	0.48	0.59	1.23	0.48
Control Delay	111.7	9.5	26.0	33.5	19.0	52.8	176.6	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.7	9.5	26.0	33.5	19.0	52.8	176.6	11.5
Queue Length 50th (m)	85.4	40.3	6.7	163.9	55.8	27.6	~144.8	9.5
Queue Length 95th (m)	#146.2	60.5	15.1	180.8	84.3	52.4	#209.3	36.6
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	310	3372	190	2554	863	214	302	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.38	0.20	0.72	0.48	0.59	1.23	0.48

Intersection Summary

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

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

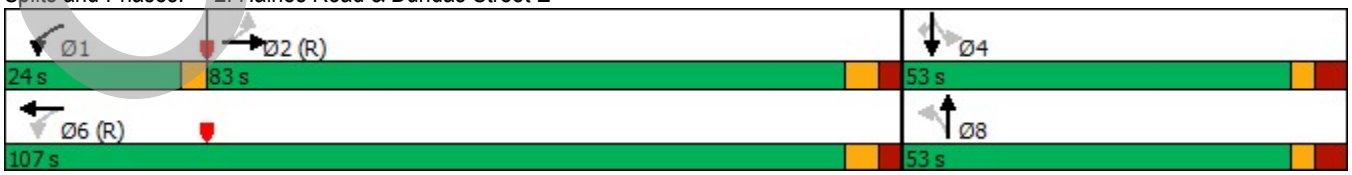
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	1820	159	201	746	52	63	9	141	79	28	55
Future Volume (vph)	54	1820	159	201	746	52	63	9	141	79	28	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.990			0.859				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5080	0	1789	5090	0	1789	1618	0	1789	1883	1601
Flt Permitted	0.315			0.052			0.738			0.405		
Satd. Flow (perm)	593	5080	0	98	5090	0	1390	1618	0	763	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			13			153				60
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	59	1978	173	218	811	57	68	10	153	86	30	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	2151	0	218	868	0	68	163	0	86	30	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4

OPTIMIZED

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		53.0	53.0	53.0
Total Split (s)	83.0	83.0		24.0	107.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	51.9%	51.9%		15.0%	66.9%		33.1%	33.1%		33.1%	33.1%	33.1%
Maximum Green (s)	76.0	76.0		21.0	100.0		46.0	46.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		6.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0		36.0	36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)	105.8	105.8		132.2	128.2		17.8	17.8		18.8	17.8	17.8
Actuated g/C Ratio	0.66	0.66		0.83	0.80		0.11	0.11		0.12	0.11	0.11
v/c Ratio	0.15	0.64		0.76	0.21		0.44	0.52		0.97	0.14	0.26
Control Delay	9.2	11.7		78.8	1.5		73.7	16.4		154.5	62.7	15.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	9.2	11.7		78.8	1.5		73.7	16.4		154.5	62.7	15.7
LOS	A	B		E	A		E	B		F	E	B
Approach Delay		11.7			17.0			33.2			91.5	
Approach LOS		B			B			C			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 85.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Haines Road & Dundas Street E



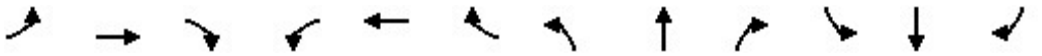
OPTIMIZED

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	2151	218	868	68	163	86	30	60
v/c Ratio	0.15	0.64	0.76	0.21	0.44	0.52	0.97	0.14	0.26
Control Delay	9.2	11.7	78.8	1.5	73.7	16.4	154.5	62.7	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	11.7	78.8	1.5	73.7	16.4	154.5	62.7	15.7
Queue Length 50th (m)	5.0	85.2	44.9	6.4	20.6	2.9	27.7	8.8	0.0
Queue Length 95th (m)	m9.4	115.5	73.0	10.9	35.2	24.4	#51.3	18.5	13.4
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	391	3361	318	4082	399	574	224	541	503
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.64	0.69	0.21	0.17	0.28	0.38	0.06	0.12

Intersection Summary

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

OPTIMIZED



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	294	1625	8	7	635	222	4	6	17	326	11	262
Future Volume (vph)	294	1625	8	7	635	222	4	6	17	326	11	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.916				0.850
Flt Protected	0.950			0.950				0.993			0.954	
Satd. Flow (prot)	1789	5137	0	1789	5142	1601	0	1713	0	0	1797	1601
Flt Permitted	0.324			0.108				0.952			0.712	
Satd. Flow (perm)	610	5137	0	203	5142	1601	0	1642	0	0	1341	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				140		8				285
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	320	1766	9	8	690	241	4	7	18	354	12	285
Shared Lane Traffic (%)												
Lane Group Flow (vph)	320	1775	0	8	690	241	0	29	0	0	366	285
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

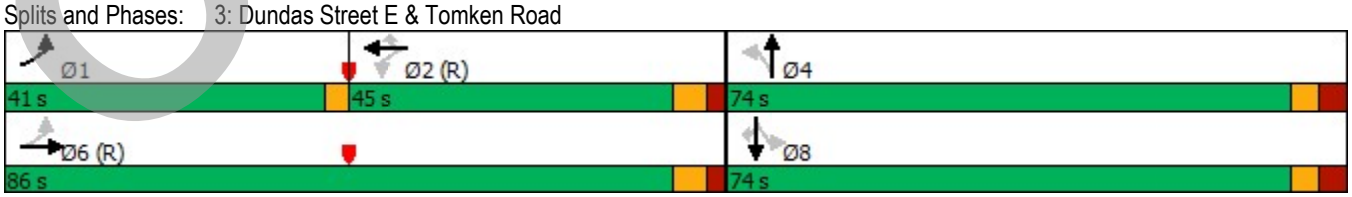
OPTIMIZED

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	41.0	86.0		45.0	45.0	45.0	74.0	74.0		74.0	74.0	74.0
Total Split (%)	25.6%	53.8%		28.1%	28.1%	28.1%	46.3%	46.3%		46.3%	46.3%	46.3%
Maximum Green (s)	38.0	79.5		38.5	38.5	38.5	67.0	67.0		67.0	67.0	67.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			-2.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			5.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	98.7	95.2		72.5	72.5	72.5		51.3			53.3	51.3
Actuated g/C Ratio	0.62	0.60		0.45	0.45	0.45		0.32			0.33	0.32
v/c Ratio	0.62	0.58		0.09	0.30	0.30		0.05			0.82	0.40
Control Delay	28.9	23.1		38.1	30.7	15.1		25.8			63.2	4.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	28.9	23.1		38.1	30.7	15.1		25.8			63.2	4.9
LOS	C	C		D	C	B		C			E	A
Approach Delay		24.0			26.8			25.8			37.7	
Approach LOS		C			C			C			D	

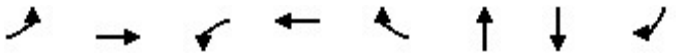
Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 27.1 Intersection LOS: C
Intersection Capacity Utilization 78.5% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Dundas Street E & Tomken Road



OPTIMIZED



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	320	1775	8	690	241	29	366	285
v/c Ratio	0.62	0.58	0.09	0.30	0.30	0.05	0.82	0.40
Control Delay	28.9	23.1	38.1	30.7	15.1	25.8	63.2	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	23.1	38.1	30.7	15.1	25.8	63.2	4.9
Queue Length 50th (m)	41.6	88.4	1.5	50.3	18.6	4.6	106.1	0.0
Queue Length 95th (m)	98.1	155.0	6.9	77.1	49.2	10.9	130.7	18.0
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	656	3055	92	2331	802	692	578	836
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.58	0.09	0.30	0.30	0.04	0.63	0.34

Intersection Summary

OPTIMIZED

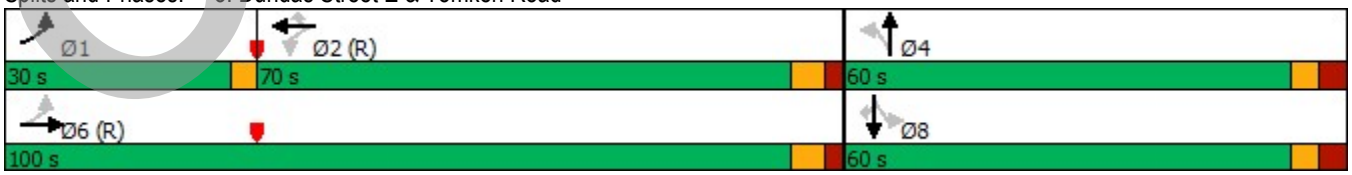
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	282	1134	45	35	1685	377	38	22	56	314	28	266
Future Volume (vph)	282	1134	45	35	1685	377	38	22	56	314	28	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.935				0.850
Flt Protected	0.950			0.950				0.984			0.956	
Satd. Flow (prot)	1789	5111	0	1789	5142	1601	0	1733	0	0	1801	1601
Flt Permitted	0.057			0.204				0.586			0.642	
Satd. Flow (perm)	107	5111	0	384	5142	1601	0	1032	0	0	1209	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				113		32				288
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	307	1233	49	38	1832	410	41	24	61	341	30	289
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1282	0	38	1832	410	0	126	0	0	371	289
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

OPTIMIZED

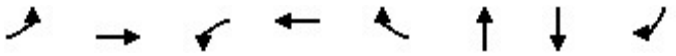
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	30.0	100.0		70.0	70.0	70.0	60.0	60.0		60.0	60.0	60.0
Total Split (%)	18.8%	62.5%		43.8%	43.8%	43.8%	37.5%	37.5%		37.5%	37.5%	37.5%
Maximum Green (s)	27.0	93.5		63.5	63.5	63.5	53.0	53.0		53.0	53.0	53.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	98.9	95.4		67.2	67.2	67.2		51.1			51.1	51.1
Actuated g/C Ratio	0.62	0.60		0.42	0.42	0.42		0.32			0.32	0.32
v/c Ratio	0.93	0.42		0.24	0.85	0.56		0.36			0.96	0.41
Control Delay	99.1	17.8		37.3	47.3	29.0		33.4			89.9	5.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	99.1	17.8		37.3	47.3	29.0		33.4			89.9	5.7
LOS	F	B		D	D	C		C			F	A
Approach Delay		33.5			43.8			33.4			53.0	
Approach LOS		C			D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 41.3		Intersection LOS: D	
Intersection Capacity Utilization 88.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Dundas Street E & Tomken Road



OPTIMIZED



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	307	1282	38	1832	410	126	371	289
v/c Ratio	0.93	0.42	0.24	0.85	0.56	0.36	0.96	0.41
Control Delay	99.1	17.8	37.3	47.3	29.0	33.4	89.9	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.1	17.8	37.3	47.3	29.0	33.4	89.9	5.7
Queue Length 50th (m)	87.3	59.1	8.1	199.2	74.3	22.4	114.2	0.2
Queue Length 95th (m)	#135.8	93.2	18.4	219.6	109.6	41.7	#177.1	21.0
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	349	3050	161	2159	737	363	400	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.42	0.24	0.85	0.56	0.35	0.93	0.40

Intersection Summary

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

OPTIMIZED

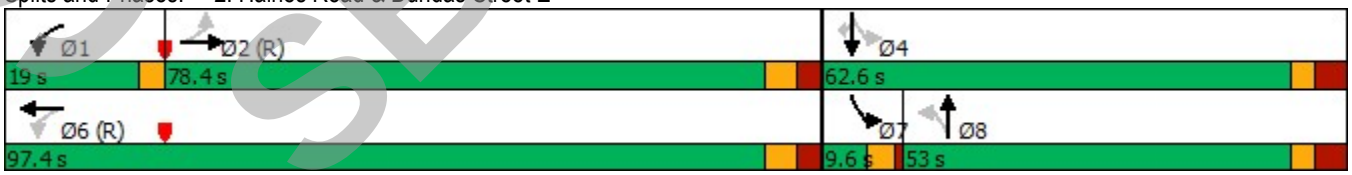
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	1820	159	201	746	52	63	9	141	79	28	55
Future Volume (vph)	54	1820	159	201	746	52	63	9	141	79	28	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.990			0.859				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5080	0	1789	5090	0	1789	1618	0	1789	1883	1601
Flt Permitted	0.315			0.045			0.738			0.246		
Satd. Flow (perm)	593	5080	0	85	5090	0	1390	1618	0	463	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			11			153				60
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	59	1978	173	218	811	57	68	10	153	86	30	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	2151	0	218	868	0	68	163	0	86	30	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6			8			4		4

SENSITIVITY
SBL ADVANCE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		7	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		5.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		9.5	53.0	53.0
Total Split (s)	78.4	78.4		19.0	97.4		53.0	53.0		9.6	62.6	62.6
Total Split (%)	49.0%	49.0%		11.9%	60.9%		33.1%	33.1%		6.0%	39.1%	39.1%
Maximum Green (s)	71.4	71.4		16.0	90.4		46.0	46.0		5.1	55.6	55.6
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.5	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		1.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		3.5	7.0	7.0
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0			10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0			36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0			0	0
Act Effct Green (s)	98.3	98.3		127.1	123.1		13.3	13.3		26.4	22.9	22.9
Actuated g/C Ratio	0.61	0.61		0.79	0.77		0.08	0.08		0.16	0.14	0.14
v/c Ratio	0.16	0.69		0.73	0.22		0.59	0.59		0.68	0.11	0.21
Control Delay	11.6	16.8		79.5	2.2		90.0	20.6		84.9	58.7	14.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	11.6	16.8		79.5	2.2		90.0	20.6		84.9	58.7	14.1
LOS	B	B		E	A		F	C		F	E	B
Approach Delay		16.7			17.7			41.0			56.3	
Approach LOS		B			B			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 84.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Haines Road & Dundas Street E



SENSITIVITY
SBL ADVANCE

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	2151	218	868	68	163	86	30	60
v/c Ratio	0.16	0.69	0.73	0.22	0.59	0.59	0.68	0.11	0.21
Control Delay	11.6	16.8	79.5	2.2	90.0	20.6	84.9	58.7	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	16.8	79.5	2.2	90.0	20.6	84.9	58.7	14.1
Queue Length 50th (m)	5.6	142.5	47.0	7.7	21.3	3.0	24.4	8.4	0.0
Queue Length 95th (m)	m10.4	127.9	82.6	14.9	37.1	25.8	39.7	18.1	13.1
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	364	3125	299	3917	399	574	126	654	595
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.69	0.73	0.22	0.17	0.28	0.68	0.05	0.10

Intersection Summary

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

SENSITIVITY
SBL ADVANCE

APPENDIX J:

ITE Trip Generation Manual Excerpts

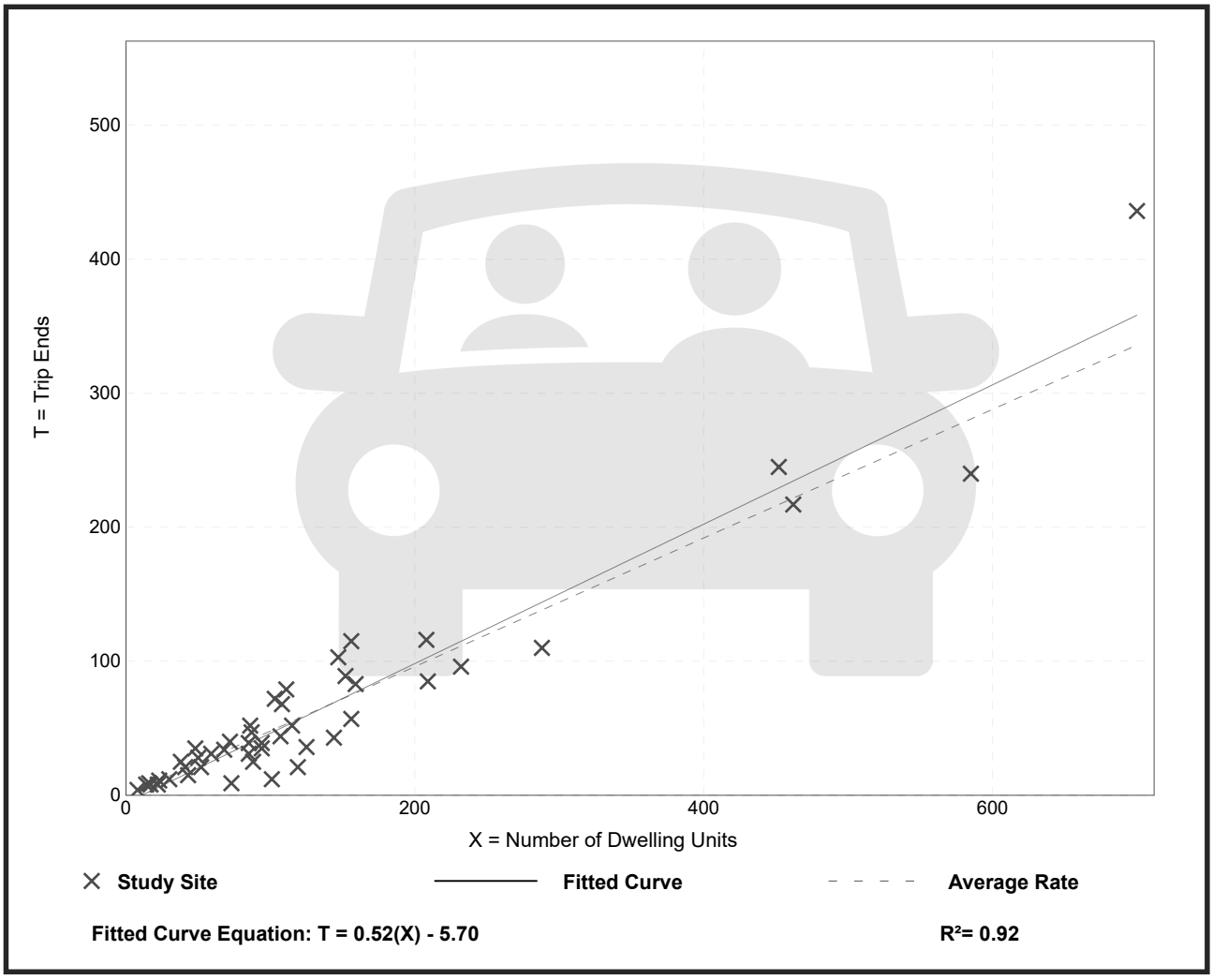
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
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: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



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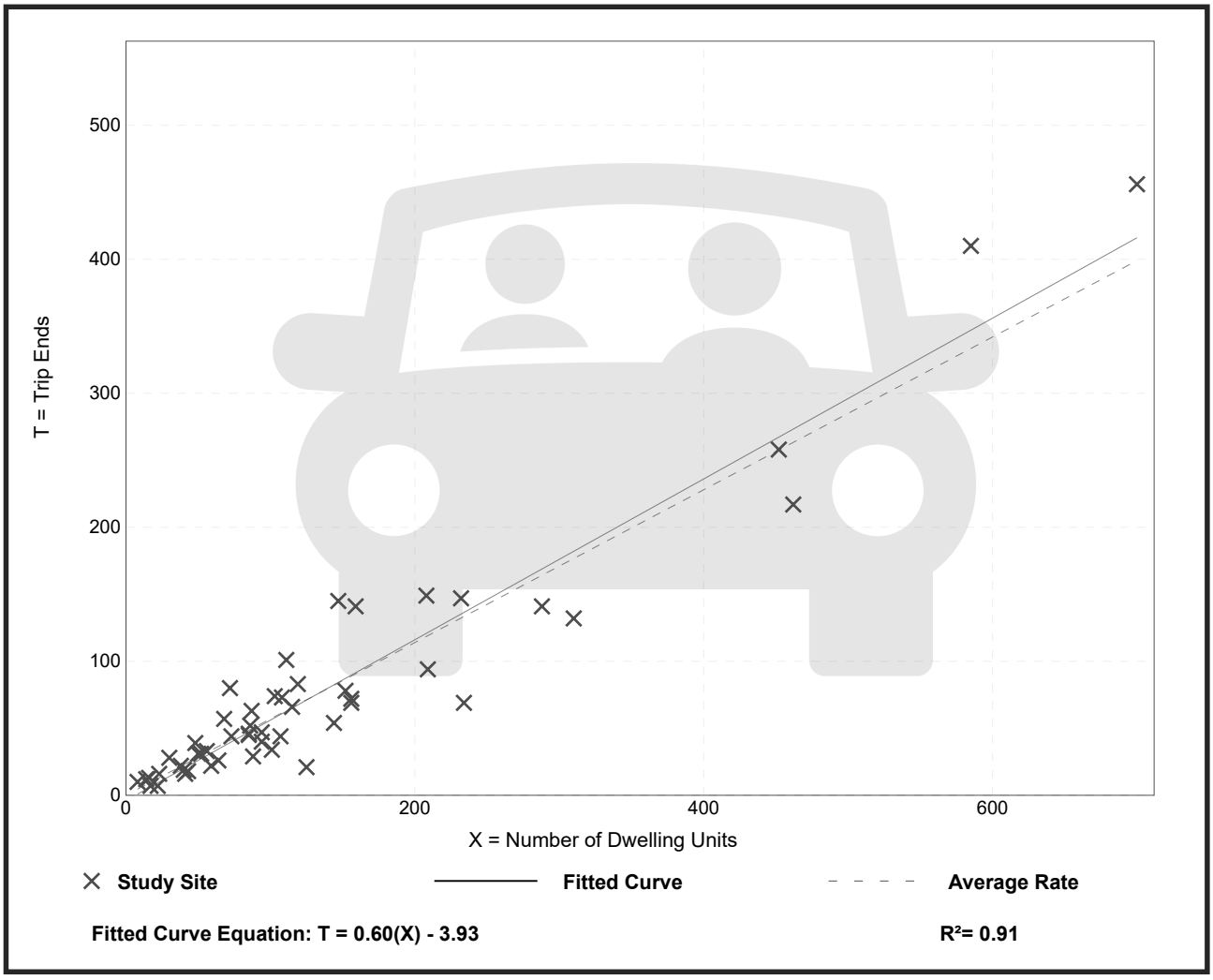
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
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: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



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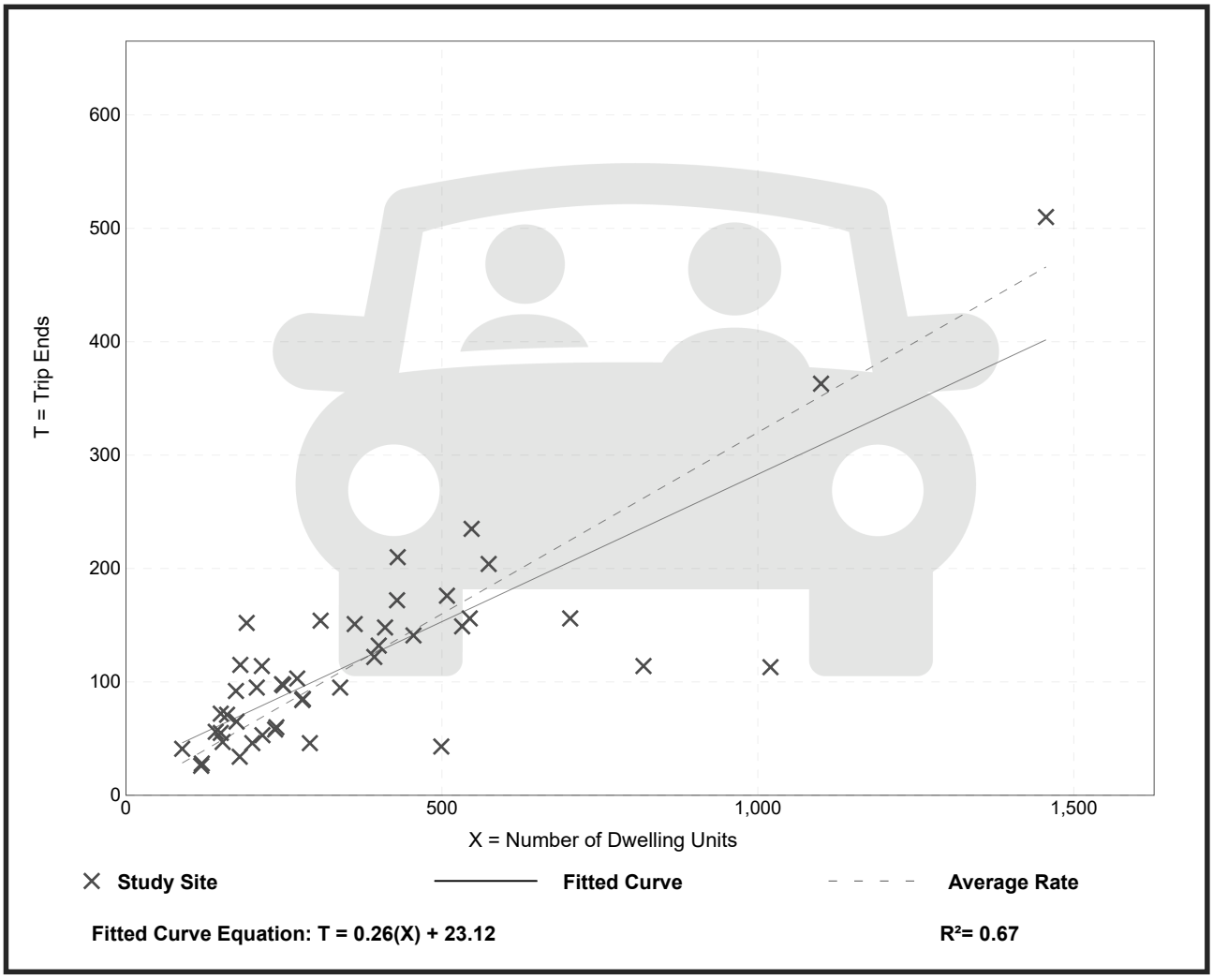
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

Vehicle Trip Ends vs:	**Dwelling Units**
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:	45
Avg. Num. of Dwelling Units:	372
Directional Distribution:	56% entering, 44% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.32	0.09 - 0.80	0.13

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

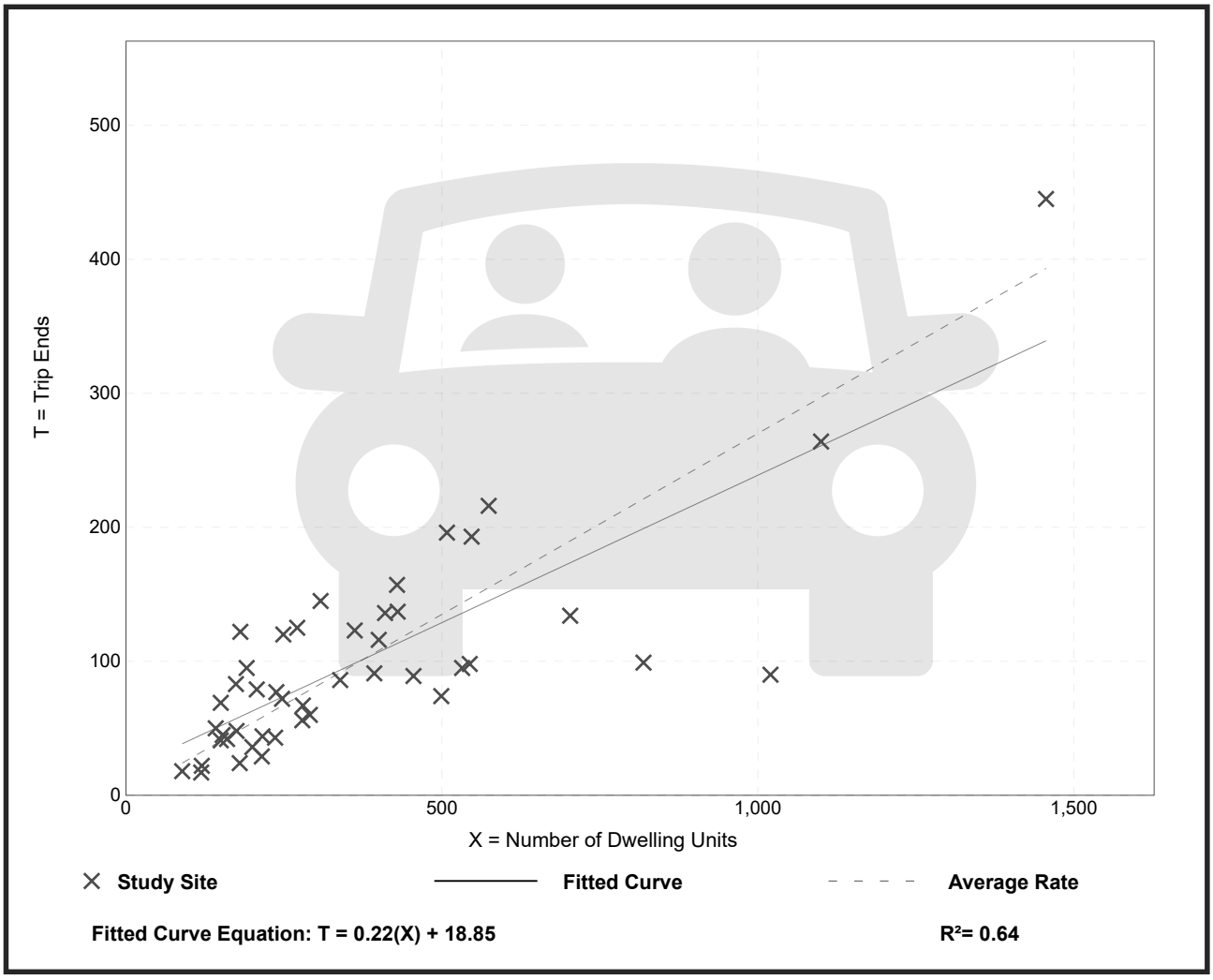
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

Vehicle Trip Ends vs: **Dwelling Units**
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: 45
Avg. Num. of Dwelling Units: 372
Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.27	0.09 - 0.67	0.11

Data Plot and Equation



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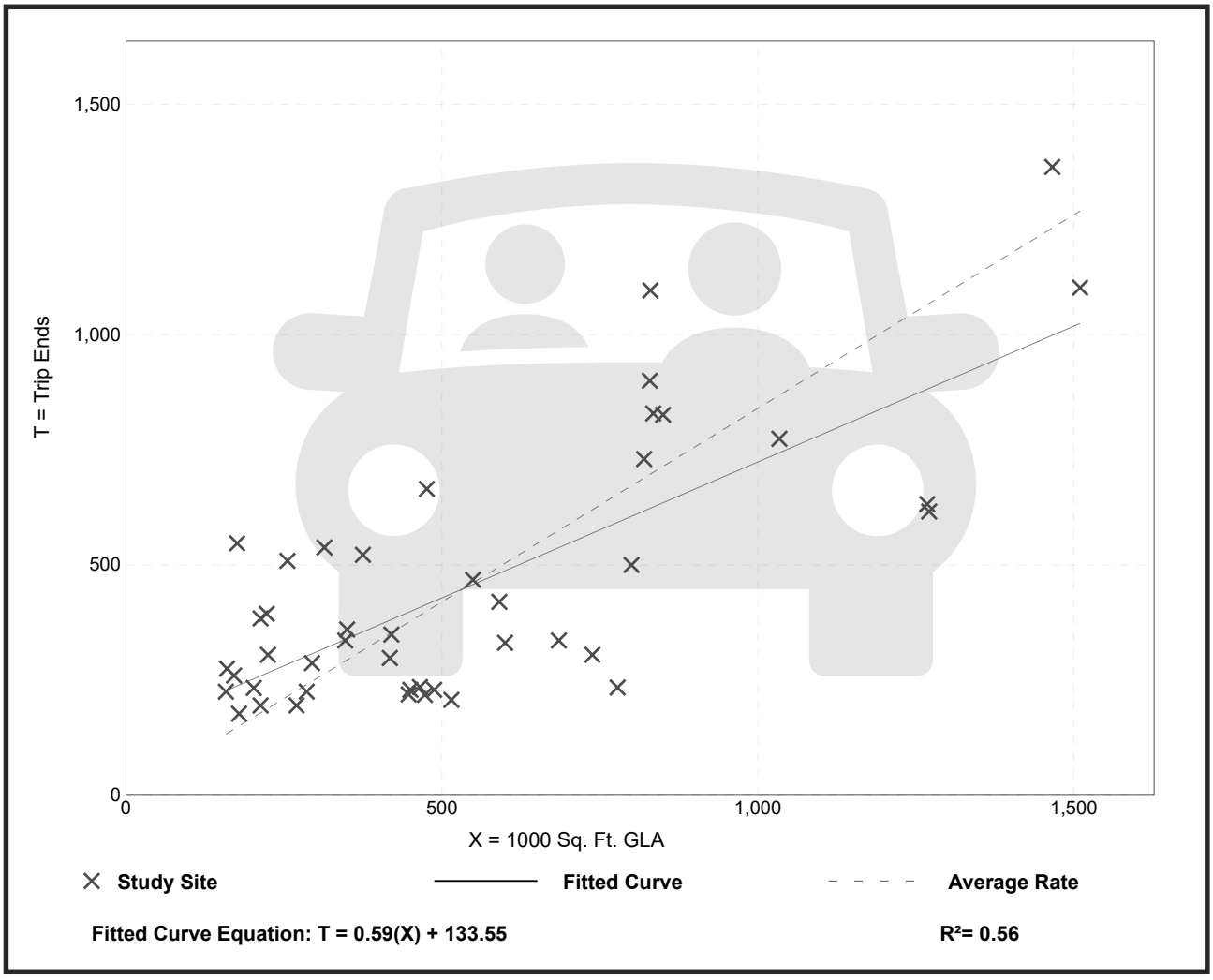
Shopping Center (>150k)
(820)

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: 44
Avg. 1000 Sq. Ft. GLA: 546
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
0.84	0.30 - 3.11	0.42

Data Plot and Equation



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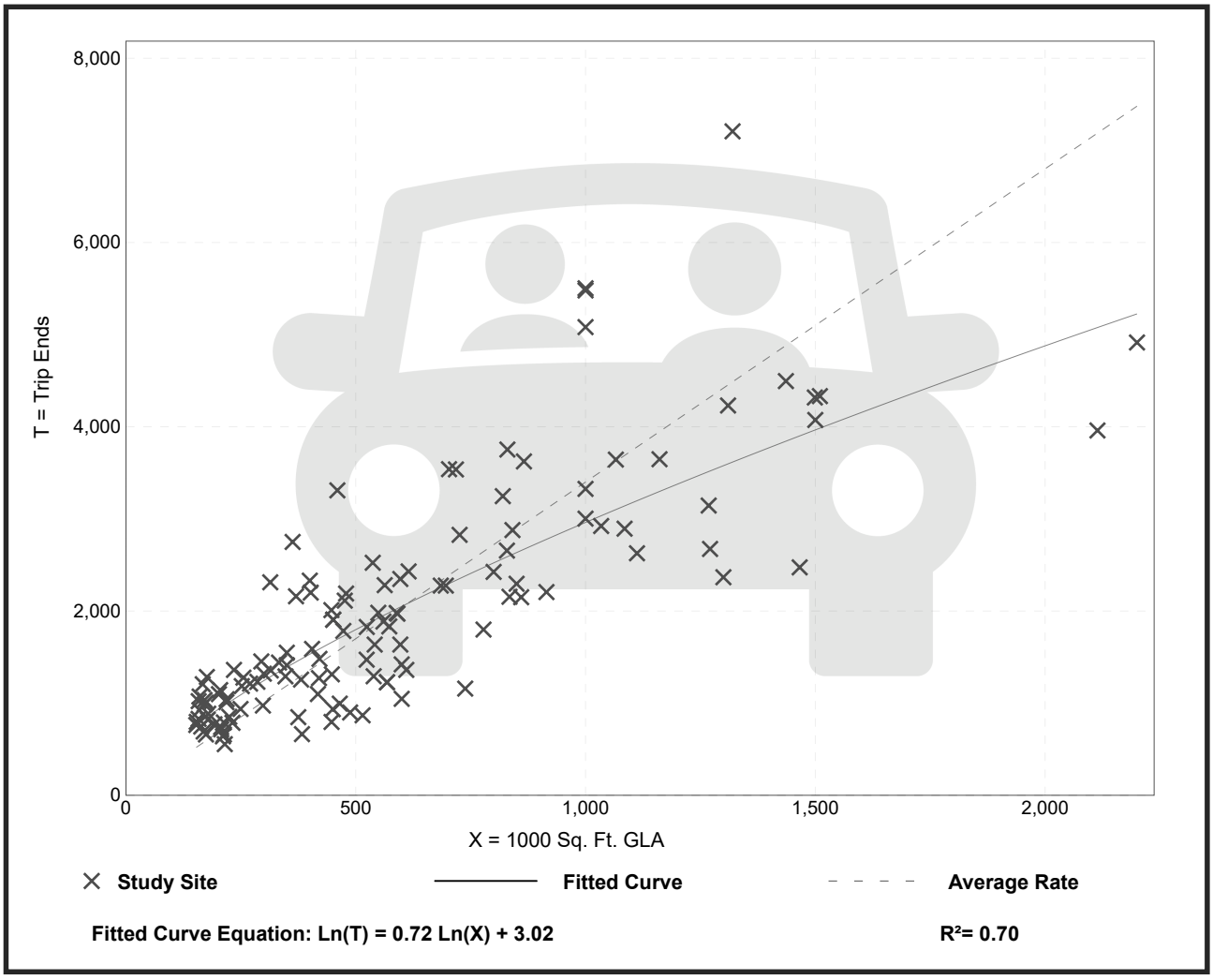
Shopping Center (>150k)
(820)

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: 126
Avg. 1000 Sq. Ft. GLA: 581
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
3.40	1.57 - 7.58	1.26

Data Plot and Equation



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APPENDIX K:

Internal Trip Capture Worksheet

New Internal Trip Capture Methodology for Multi-Use Developments

Based on NCHRP Project 8-51

Note: Saturday is assumed to be the same as PM Peak Hour for Multi-Use Reductions, if Saturday Multi-Use is assumed, this must be disclosed

Do not modify values in Grey Cells

INPUTS

Volumes

Use	AM Volumes		PM Volumes		Saturday Volumes	
	Entering	Exiting	Entering	Exiting	Entering	Exiting
Office						
Retail	13	8	40	43		
Restaurant						
Cinema/ Entertainment						
Residential	71	56	36	70		
Hotel						

Proximity of Uses

Use	Separation Distance (**In Feet**)					
	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail			0	0	0	0
Restaurant				0	0	0
Cinema/ Entertainment					0	0
Residential						0
Hotel						

OUTPUTS

AM Peak Hour Multi-Use Reduction Summary

	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel	In	In%
Office	0	0	0	0	0	0	**0**	**0%**
Retail	0	0	0	0	1	0	**1**	**4%**
Restaurant	0	0	0	0	0	0	**0**	**0%**
Cinema/ Entertainment	0	0	0	0	0	0	**0**	**0%**
Residential	0	1	0	0	0	0	**1**	**2%**
Hotel	0	0	0	0	0	0	**0**	**0%**
Out	**0**	**1**	**0**	**0**	**1**	**0**		
Out %	**0%**	**14%**	**0%**	**0%**	**1%**	**0%**		

PM Peak Hour Multi-Use Reduction Summary (Contains Proximity Factors)

	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel	In	In%
Office	0	0	0	0	0	0	**0**	**0%**
Retail	0	0	0	0	4	0	**4**	**10%**
Restaurant	0	0	0	0	0	0	**0**	**0%**
Cinema/ Entertainment	0	0	0	0	0	0	**0**	**0%**
Residential	0	11	0	0	0	0	**11**	**31%**
Hotel	0	0	0	0	0	0	**0**	**0%**
Out	**0**	**11**	**0**	**0**	**4**	**0**		
Out %	**0%**	**26%**	**0%**	**0%**	**6%**	**0%**		

Saturday Peak Hour Multi-Use Reduction Summary (Contains Proximity Factors)

	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel	In	In%
Office	0	0	0	0	0	0	**0**	**0%**
Retail	0	0	0	0	0	0	**0**	**0%**
Restaurant	0	0	0	0	0	0	**0**	**0%**
Cinema/ Entertainment	0	0	0	0	0	0	**0**	**0%**
Residential	0	0	0	0	0	0	**0**	**0%**
Hotel	0	0	0	0	0	0	**0**	**0%**
Out	**0**	**0**	**0**	**0**	**0**	**0**		
Out %	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**		

Supporting Data

Percentages from ITE Journal August 2010: "Improved Estimation of Internal Trip Capture for Mixed-Use Developments"

AM From-To Percentages Matrix

To	From					
	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel
Office		29%	31%		2%	75%
Retail	28%		14%		1%	14%
Restaurant	63%	13%			20%	9%
Cinema/ Entertainment						
Residential	1%	14%	4%			0%
Hotel	0%	0%	3%		0%	

AM To-From Percentages Matrix

To	From					
	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel
Office		4%	14%		3%	3%
Retail	32%		8%		17%	4%
Restaurant	23%	50%			20%	6%
Cinema/ Entertainment						
Residential	0%	2%	5%			0%
Hotel	0%	0%	4%		0%	

PM (Saturday) From-To Percentages Matrix

To	From					
	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel
Office		2%	3%	2%	4%	0%
Retail	20%		41%	21%	42%	16%
Restaurant	4%	29%		31%	21%	68%
Cinema/ Entertainment	0%	4%	8%		0%	68%
Residential	2%	26%	18%	8%		0%
Hotel	0%	5%	7%	2%	3%	2%

PM (Saturday) To-From Percentages Matrix

To	From					
	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel
Office		31%	30%	6%	57%	0%
Retail	8%		50%	4%	10%	2%
Restaurant	2%	29%		3%	14%	5%
Cinema/ Entertainment	1%	26%	32%		0%	0%
Residential	4%	46%	16%	4%		0%
Hotel	0%	17%	71%	1%	12%	

PM (Saturday) Only From-To Proximity Factors Matrix

To	From					
	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel
Office	1.00	1.00	1.00	1.00	1.00	1.00
Retail	1.00	1.00	1.00	1.00	1.00	1.00
Restaurant	1.00	1.00	1.00	1.00	1.00	1.00
Cinema/ Entertainment	1.00	1.00	1.00	1.00	1.00	1.00
Residential	1.00	1.00	1.00	1.00	1.00	1.00
Hotel	1.00	1.00	1.00	1.00	1.00	1.00

PM (Saturday) Only To-From Proximity Factors Matrix

To	From					
	Office	Retail	Restaurant	Cinema/ Entertainment	Residential	Hotel
Office	1.00	1.00	1.00	1.00	1.00	1.00
Retail	1.00	1.00	1.00	1.00	1.00	1.00
Restaurant	1.00	1.00	1.00	1.00	1.00	1.00
Cinema/ Entertainment	1.00	1.00	1.00	1.00	1.00	1.00
Residential	1.00	1.00	1.00	1.00	1.00	1.00
Hotel	1.00	1.00	1.00	1.00	1.00	1.00

Red numbers for those land use pairs with proximity factors

APPENDIX L:

TTS Query Excerpts – Trip Distribution

Project Details

Project Name:	802 Dundas Street E
Project Number:	2297-6402
Created By:	FC
Date Started:	2022.05.16
Client:	KJC Properties Inc.

Site Information

Summary of Development	Mixed-use Residential and Retail; 12-storey building with ground floor retail and 3 townhouse blocks with 20 units
Site Type	Residential
Subject Zones	3669,3668,3674

TTS Query Results	
Distribution:	AM IN

Field	Selection	Value
Row variable:	2006 GTA zone of origin	-
Column variable:	2006 GTA zone of destination	-
Filter 1:	2006 GTA zone of destination	3669,3668,3674
Filter 2:	Start time of trip	0630-0930
Filter 3:	Trip purpose of destination	Home (H)

AM IN	Internal									External								Totals
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	
Trips	476	40	68	102	6	45	30	0	147	0	43	21	170	102	0	0	0	1250
%	38.08%	3.20%	5.44%	8.16%	0.48%	3.60%	2.40%	0.00%	11.76%	0.00%	3.44%	1.68%	13.60%	8.16%	0.00%	0.00%	0.00%	100.00%
% w/o trips in subject TAZ	0.00%	5.17%	8.79%	13.18%	0.78%	5.81%	3.88%	0.00%	18.99%	0.00%	5.56%	2.71%	21.96%	13.18%	0.00%	0.00%	0.00%	100.01%

Tue May 17 2022 16:29:22 GMT-0400 (Eastern Daylight Time) - Run Time: 2458ms

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 3669,3668,3674

and

Start time of trip - start_time In 630-930

and

Trip purpose of destination - purp_dest In H)

Trip 2016

Table:

,3668,3669,3674

68,0,8,0

147,0,14,0

289,0,0,57

292,13,0,0

308,13,47,20

309,0,0,24

312,0,4,0

324,0,36,0

336,0,10,0

439,0,19,0

537,17,0,0

3330,11,0,0

3419,43,0,0

3601,14,0,0

3610,0,0,24
3649,10,0,0
3658,0,4,0
3660,0,20,0
3665,23,0,0
3668,57,0,11
3669,28,151,22
3671,25,0,0
3674,25,96,86
3675,0,6,0
3696,23,0,0
3698,0,0,21
3709,0,12,0
3724,43,0,0
3815,0,0,21
3844,0,19,0
3847,14,0,0
3851,13,0,0
3859,0,90,0
3861,0,0,6
3863,0,11,0
3874,0,16,23
3877,29,0,0

TTS Query Results	
Distribution:	AM OUT

Field	Selection	Value
Row variable:	2006 GTA zone of destination	-
Column variable:	2006 GTA zone of origin	-
Filter 1:	2006 GTA zone of origin	3669,3668,3674
Filter 2:	Start time of trip	1530-1830
Filter 3:	Trip purpose of origin	Home (H)

AM OUT	Internal									External								
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	Totals
Trips	2038	751	699	884	208	201	401	336	1376	97	182	852	1158	1288	0	32	541	11044
%	18.45%	6.80%	6.33%	8.00%	1.88%	1.82%	3.63%	3.04%	12.46%	0.88%	1.65%	7.71%	10.49%	11.66%	0.00%	0.29%	4.90%	99.99%
% w/o trips in subject TAZ	0.00%	8.34%	7.76%	9.82%	2.31%	2.23%	4.45%	3.73%	15.28%	1.08%	2.02%	9.46%	12.86%	14.30%	0.00%	0.36%	6.01%	100.01%

Tue May 17 2022 16:47:56 GMT-0400 (Eastern Daylight Time) - Run Time: 2664ms

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 3669,3668,3674

and

Start time of trip - start_time In 630-930

and

Trip purpose of origin - purp_orig In H)

Trip 2016

Table:

,3668,3669,3674

11,0,0,57

21,26,4,0

25,0,0,57

32,0,0,20

36,0,20,9

37,0,0,20

38,25,17,22

41,0,25,0

43,13,15,0

48,0,17,0

50,60,19,0

51,44,40,0

52,0,97,0

53,0,20,0

54,0,18,0
55,24,28,30
56,0,33,0
57,0,72,39
59,0,19,0
63,51,0,46
65,14,13,6
67,0,6,0
68,0,8,9
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116,12,0,0
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269,0,9,0
290,0,13,0
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406,0,0,15
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2096,106,0,0
2236,0,46,0
2366,0,17,0
2369,0,0,33
2372,0,0,32
2395,8,0,0
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2656,0,22,0
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3662,0,11,46
3663,0,11,0
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3665,46,0,0
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3671,264,0,37
3672,0,4,0
3673,10,0,0

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3680,0,84,0
3681,0,13,0
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3684,14,0,0
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3690,32,0,0
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3693,0,21,0
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3697,12,0,0
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3700,0,0,33
3701,49,27,37
3702,0,90,20
3703,0,29,0

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3709,14,8,0
3710,0,87,0
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3719,0,19,0
3720,0,16,0
3721,0,108,19
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3821,23,0,0
3823,20,0,0
3825,0,0,12
3828,0,0,9
3831,0,10,0
3836,8,0,0
3838,0,9,0
3841,0,19,0
3842,26,0,11
3844,0,19,0
3846,0,69,0
3847,9,13,0
3848,0,55,0
3851,54,10,31
3853,17,0,0
3857,0,10,20
3858,79,0,15
3859,0,203,0
3860,0,15,0
3861,15,11,6
3862,60,11,7
3863,40,11,0
3867,8,13,0
3872,37,0,0
3874,23,40,41
4009,0,0,17
4016,15,0,0
4024,0,33,68
4029,13,0,24
4030,28,0,18
4035,0,46,0
4040,0,4,0
4041,13,46,0
4069,0,0,32
4082,16,0,0
4087,13,0,0
4126,0,22,0

4147,37,0,0
4185,0,30,0
5142,0,28,0
5198,0,30,0
6129,0,14,0
6258,0,46,0
7302,0,14,0
8057,22,0,0
8145,0,0,6
8614,14,0,0
8910,0,0,17

TTS Query Results	
Distribution:	PM IN

Field	Selection	Value
Row variable:	2006 GTA zone of origin	-
Column variable:	2006 GTA zone of destination	-
Filter 1:	2006 GTA zone of destination	3669,3668,3674
Filter 2:	Start time of trip	1530-1830
Filter 3:	Trip purpose of destination	Home (H)

PM IN	Internal									External								
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	Totals
Trips	951	650	676	725	299	274	405	354	812	117	209	651	1041	1349	0	69	438	9020
%	10.54%	7.21%	7.49%	8.04%	3.31%	3.04%	4.49%	3.92%	9.00%	1.30%	2.32%	7.22%	11.54%	14.96%	0.00%	0.76%	4.86%	100.00%
% w/o trips in subject TAZ	0.00%	8.06%	8.38%	8.99%	3.71%	3.40%	5.02%	4.39%	10.06%	1.45%	2.59%	8.07%	12.90%	16.72%	0.00%	0.86%	5.43%	100.03%

Tue May 17 2022 16:28:52 GMT-0400 (Eastern Daylight Time) - Run Time: 2432ms

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 3669,3668,3674

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of destination - purp_dest In H)

Trip 2016

Table:

,3668,3669,3674

11,0,0,57

25,0,0,88

32,0,0,20

34,0,0,11

35,41,0,0

37,0,0,20

38,25,17,38

41,0,25,0

43,13,25,0

45,0,14,0

50,10,19,0

51,44,65,0

52,0,104,20

53,17,20,0

54,0,18,0
55,53,28,6
56,0,26,0
57,0,55,39
59,0,19,0
63,51,0,46
65,0,20,6
67,0,0,18
89,0,10,0
98,0,12,0
110,0,41,0
130,56,0,0
146,0,0,21
147,0,14,0
176,10,0,0
201,31,0,0
204,0,20,0
210,0,0,8
211,0,18,0
222,0,11,0
231,0,0,7
246,10,0,0
254,0,0,12
258,0,19,0
286,0,0,19
290,0,13,9
292,0,7,13
295,0,11,0
296,0,34,0
299,60,12,19
307,50,0,0
308,0,0,18
309,0,25,32
311,0,33,0
312,0,0,22
313,0,40,0
315,0,14,0
317,32,0,0
321,0,64,0
323,0,23,0
326,0,10,0
327,0,7,0
332,0,42,0
355,0,0,11
357,0,0,14
358,0,36,0
359,0,14,0
361,0,19,0
371,93,12,0
378,0,0,24
386,0,14,0

387,0,19,0
388,0,25,0
391,0,37,0
403,0,25,0
415,0,0,9
439,0,19,0
443,31,0,29
450,0,8,0
460,13,0,0
465,0,16,0
484,0,0,72
532,38,0,0
2004,0,0,23
2070,30,0,0
2091,0,0,22
2096,106,0,0
2236,0,46,0
2366,0,17,0
2369,0,0,33
2372,0,0,32
2395,8,0,0
2400,0,34,0
2401,9,0,31
2422,0,4,0
2562,0,10,0
2656,0,22,0
2702,0,28,0
3105,0,0,25
3323,0,18,0
3328,0,0,12
3339,0,24,0
3343,0,0,78
3364,0,18,0
3366,0,0,14
3438,24,0,0
3466,0,0,14
3518,0,0,21
3601,35,0,0
3604,0,0,15
3605,14,24,0
3608,0,17,0
3609,59,0,21
3610,0,54,55
3612,0,5,17
3613,0,11,0
3614,16,0,0
3620,0,0,39
3621,0,17,19
3626,0,35,8
3627,0,28,0
3631,16,0,15

3632,89,0,0
3634,35,0,11
3635,0,72,0
3639,0,15,0
3641,0,0,35
3643,32,0,66
3645,0,22,0
3649,57,66,106
3653,0,15,0
3654,0,35,51
3655,0,52,0
3658,26,4,0
3659,32,0,0
3660,33,45,0
3661,0,33,0
3662,0,0,46
3664,46,13,0
3666,0,5,0
3667,15,0,0
3668,68,0,25
3669,110,302,41
3671,90,21,0
3674,36,183,186
3675,0,30,79
3680,39,28,0
3681,0,13,0
3682,0,32,102
3686,0,69,0
3688,0,7,0
3692,0,64,0
3693,0,57,0
3696,20,17,0
3698,0,41,0
3699,16,0,23
3700,0,0,52
3701,49,69,17
3702,0,0,20
3703,0,45,0
3704,8,33,0
3705,0,35,26
3707,14,0,29
3709,14,50,13
3710,0,87,0
3713,0,22,0
3715,0,22,0
3719,42,0,0
3721,0,66,19
3811,13,0,0
3815,0,0,21
3816,0,44,0
3821,23,0,0

3823,20,0,0
3825,0,0,12
3828,0,0,9
3831,0,10,0
3835,0,0,24
3841,0,35,0
3843,20,0,0
3844,0,19,0
3847,9,0,0
3848,0,55,0
3851,30,40,95
3853,17,0,0
3857,0,56,15
3858,0,10,23
3859,0,0,6
3860,0,57,100
3861,15,48,0
3862,0,11,7
3863,12,0,10
3868,0,0,32
3871,54,0,0
3872,37,0,0
3874,42,41,42
3877,24,0,0
4009,0,0,17
4016,28,0,0
4021,0,0,13
4024,0,45,101
4027,0,11,0
4029,0,0,15
4030,0,0,18
4041,13,46,0
4069,0,11,32
4087,13,0,0
4126,0,22,0
4147,37,0,0
4196,0,20,0
5112,0,12,0
5142,0,28,0
5198,0,19,0
6258,0,46,0
7302,0,14,0
8057,22,0,0
8145,0,0,6
8910,0,0,17

TTS Query Results	
Distribution:	PM OUT

Field	Selection	Value
Row variable:	2006 GTA zone of destination	-
Column variable:	2006 GTA zone of origin	-
Filter 1:	2006 GTA zone of origin	3669,3668,3674
Filter 2:	Start time of trip	1530-1830
Filter 3:	Trip purpose of origin	Home (H)

PM OUT	Internal									External								
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	Totals
Trips	236	45	85	319	155	247	132	329	162	19	48	71	285	111	0	0	71	2315
%	10.19%	1.94%	3.67%	13.78%	6.70%	10.67%	5.70%	14.21%	7.00%	0.82%	2.07%	3.07%	12.31%	4.79%	0.00%	0.00%	3.07%	99.99%
% w/o trips in subject TAZ	0.00%	2.16%	4.09%	15.34%	7.46%	11.88%	6.35%	15.82%	7.79%	0.91%	2.31%	3.42%	13.71%	5.34%	0.00%	0.00%	3.42%	100.00%

Tue May 17 2022 16:57:13 GMT-0400 (Eastern Daylight Time) - Run Time: 2872ms

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 3669,3668,3674

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of origin - purp_orig In H)

Trip 2016

Table:

,3668,3669,3674

36,0,0,21

50,10,0,0

54,0,10,0

127,13,0,0

147,0,14,0

157,0,0,23

211,0,56,0

259,68,0,0

286,0,0,29

308,13,0,18

309,0,17,24

312,0,0,11

323,0,36,0

328,14,0,0

335,0,0,21
391,50,0,0
439,0,19,0
3325,0,24,0
3339,0,24,0
3479,0,19,0
3610,0,11,0
3632,0,18,0
3635,0,29,0
3639,0,0,6
3641,0,0,35
3649,0,42,0
3653,41,15,0
3654,0,18,0
3659,0,11,24
3660,41,25,24
3661,0,81,0
3665,0,6,0
3667,116,0,0
3668,25,0,25
3669,23,27,0
3670,0,0,11
3671,0,21,0
3674,0,35,101
3675,0,0,25
3676,0,0,12
3680,13,13,0
3682,0,0,72
3693,25,0,0
3698,0,14,0
3699,0,19,0
3700,0,0,19
3701,0,27,0
3703,0,16,0
3709,0,42,0
3844,0,19,0
3847,0,0,14
3848,0,18,0
3851,16,9,12
3857,0,17,41
3858,0,56,0
3859,0,45,0
3860,0,0,38
3861,0,42,0
3862,0,0,15
3863,0,0,10
3871,30,0,0
3872,33,0,0
3874,82,83,22
4103,0,0,28
5164,43,0,0

Time Period	Internal								External								Total
	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	
AM (IN)	5.2%	8.8%	13.2%	0.8%	5.8%	3.9%	0.0%	19.0%	0.0%	5.6%	2.7%	22.0%	13.2%	0.0%	0.0%	0.0%	100.0%
AM (OUT)	8.3%	7.8%	9.8%	2.3%	2.2%	4.5%	3.7%	15.3%	1.1%	2.0%	9.5%	12.9%	14.3%	0.0%	0.4%	6.0%	100.0%
PM (IN)	8.1%	8.4%	9.0%	3.7%	3.4%	5.0%	4.4%	10.1%	1.5%	2.6%	8.1%	12.9%	16.7%	0.0%	0.9%	5.4%	100.0%
PM (OUT)	2.2%	4.1%	15.3%	7.5%	11.9%	6.4%	15.8%	7.8%	0.9%	2.3%	3.4%	13.7%	5.3%	0.0%	0.0%	3.4%	100.0%

Project Details

Project Name:	802 Dundas Street E
Project Number:	2297-6402
Created By:	FC
Date Started:	2022.05.16
Client:	KJC Properties Inc.

Site Information

Summary of Development	Mixed-use Residential and Retail; 12-storey building with ground floor retail and 3 townhouse blocks with 20 units
Site Type	Retail
Subject Zones	3669,3668,3659,3660,3667,3674

TTS Query Results	
Distribution:	**AM IN**

Field	Selection	Value
Row variable:	2006 GTA zone of origin	-
Column variable:	2006 GTA zone of destination	-
Filter 1:	2006 GTA zone of destination	,3668,3659,3660,3667,
Filter 2:	Start time of trip	0630-0930
Filter 3:	Trip purpose of destination	Market/Shop (M)

AM IN	Internal									External								Totals
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	
Trips	93	14	26	35	0	0	0	41	11	0	28	19	19	0	0	0	0	286
%	32.52%	4.90%	9.09%	12.24%	0.00%	0.00%	0.00%	14.34%	3.85%	0.00%	9.79%	6.64%	6.64%	0.00%	0.00%	0.00%	0.00%	100.01%
% w/o trips in subject TAZ	0.00%	7.25%	13.47%	18.13%	0.00%	0.00%	0.00%	21.24%	5.70%	0.00%	14.51%	9.84%	9.84%	0.00%	0.00%	0.00%	0.00%	99.98%

Wed May 18 2022 08:45:49 GMT-0400 (Eastern Daylight Time) - Run Time: 2601ms

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 3669,3668,3659,3660,3667,3674

and

Start time of trip - start_time In 630-930

and

Trip purpose of destination - purp_dest In M)

Trip 2016

Table:

,3659,3660,3668,3674

314,0,19,0,0

333,0,19,0,0

3464,0,28,0,0

3610,0,10,0,0

3647,0,23,0,0

3653,0,18,0,0

3655,0,11,0,0

3668,0,0,25,0

3669,0,20,18,10

3674,0,9,11,0

3675,0,22,0,0

3680,0,0,0,14

3682,0,0,0,13

3687,16,0,0,0

3852,0,0,0,25

TTS Query Results	
Distribution:	AM OUT

Field	Selection	Value
Row variable:	2006 GTA zone of destination	-
Column variable:	2006 GTA zone of origin	-
Filter 1:	2006 GTA zone of origin	,3668,3659,3660,3667,
Filter 2:	Start time of trip	1530-1830
Filter 3:	Trip purpose of origin	Market/Shop (M)

AM OUT	Internal									External								Totals
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	
Trips	31	33	0	14	0	0	0	18	0	0	0	0	18	25	0	0	0	139
%	22.30%	23.74%	0.00%	10.07%	0.00%	0.00%	0.00%	12.95%	0.00%	0.00%	0.00%	0.00%	12.95%	17.99%	0.00%	0.00%	0.00%	100.00%
% w/o trips in subject TAZ	0.00%	30.56%	0.00%	12.96%	0.00%	0.00%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	16.67%	23.15%	0.00%	0.00%	0.00%	100.01%

Wed May 18 2022 08:44:08 GMT-0400 (Eastern Daylight Time) - Run Time: 2331ms

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 3669,3668,3659,3660,3667,3674

and

Start time of trip - start_time In 630-930

and

Trip purpose of origin - purp_orig In M)

Trip 2016

Table:

,3660,3668,3674

26,0,0,25

309,0,18,0

3652,18,0,0

3669,20,0,0

3674,0,11,0

3702,0,0,14

3719,33,0,0

3874,9,0,0

TTS Query Results	
Distribution:	**PM IN**

Field	Selection	Value
Row variable:	**2006 GTA zone of origin**	**-**
Column variable:	**2006 GTA zone of destination**	**-**
Filter 1:	**2006 GTA zone of destination**	**,3668,3659,3660,3667,**
Filter 2:	**Start time of trip**	**1530-1830**
Filter 3:	**Trip purpose of destination**	**Market/Shop (M)**

PM IN	Internal									External								Totals
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	
Trips	134	137	11	100	68	88	60	16	62	0	0	91	43	23	0	0	39	872
%	15.37%	15.71%	1.26%	11.47%	7.80%	10.09%	6.88%	1.83%	7.11%	0.00%	0.00%	10.44%	4.93%	2.64%	0.00%	0.00%	4.47%	100.00%
% w/o trips in subject TAZ	0.00%	18.56%	1.49%	13.55%	9.21%	11.92%	8.13%	2.17%	8.40%	0.00%	0.00%	12.33%	5.83%	3.12%	0.00%	0.00%	5.28%	99.99%

Wed May 18 2022 08:45:27 GMT-0400 (Eastern Daylight Time) - Run Time: 3362ms

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 3669,3668,3659,3660,3667,3674

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of destination - purp_dest In M)

Trip 2016

Table:

,3659,3660,3668,3669,3674

67,0,0,0,0,16

295,0,0,7,0,0

307,0,27,0,0,0

313,0,0,16,0,0

351,0,0,0,10,0

2085,0,0,0,0,16

3336,0,65,0,0,0

3632,0,0,0,0,16

3634,0,0,0,0,15

3635,0,0,0,0,20

3642,0,9,0,0,0

3643,0,13,0,0,0

3648,38,0,0,0,0

3654,0,75,13,0,0

3655,0,23,0,0,0
3658,0,0,0,0,33
3660,0,6,0,0,0
3668,0,20,13,23,0
3669,0,25,0,0,35
3670,0,34,0,0,13
3671,0,0,0,0,4
3673,0,0,0,0,24
3674,0,0,0,0,12
3693,0,0,0,0,11
3709,0,0,14,0,0
3715,0,0,7,0,0
3851,0,0,0,0,62
3857,0,25,0,61,0
3861,0,5,0,0,0
3863,0,0,0,0,11
3874,0,0,0,0,16
4004,0,24,0,0,0
4024,0,0,15,0,0

TTS Query Results	
Distribution:	PM OUT

Field	Selection	Value
Row variable:	2006 GTA zone of destination	-
Column variable:	2006 GTA zone of origin	-
Filter 1:	2006 GTA zone of origin	,3668,3659,3660,3667,
Filter 2:	Start time of trip	1530-1830
Filter 3:	Trip purpose of origin	Market/Shop (M)

PM OUT	Internal									External								
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	Totals
Trips	251	166	71	125	60	37	74	37	81	0	0	0	28	0	0	0	0	930
%	26.99%	17.85%	7.63%	13.44%	6.45%	3.98%	7.96%	3.98%	8.71%	0.00%	0.00%	0.00%	3.01%	0.00%	0.00%	0.00%	0.00%	100.00%
% w/o trips in subject TAZ	0.00%	24.45%	10.46%	18.41%	8.84%	5.45%	10.90%	5.45%	11.93%	0.00%	0.00%	0.00%	4.12%	0.00%	0.00%	0.00%	0.00%	100.01%

Wed May 18 2022 08:44:51 GMT-0400 (Eastern Daylight Time) - Run Time: 2512ms

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 3669,3668,3659,3660,3667,3674

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of origin - purp_orig In M)

Trip 2016

Table:

,3659,3660,3667,3668,3669,3674

312,0,0,21,0,0,0

323,0,0,0,7,0,0

3604,0,0,7,0,0,0

3608,0,17,0,0,0,0

3610,0,0,0,0,0,48

3622,19,0,0,0,0,0

3643,0,13,0,0,0,0

3648,38,16,0,0,0,0

3651,0,0,0,0,10,0

3653,0,20,0,17,0,0

3654,0,37,0,0,0,0

3659,0,15,0,13,0,0

3660,0,6,0,0,0,0

3663,0,0,0,0,0,62

3668,0,0,0,15,23,31
3669,0,31,0,0,0,89
3670,0,12,0,0,0,25
3672,0,9,0,0,0,0
3673,0,0,0,15,0,24
3674,0,0,0,0,0,28
3681,0,45,0,0,0,0
3686,0,0,0,0,0,4
3690,0,23,0,0,0,0
3694,0,0,0,0,0,35
3851,0,25,0,0,0,0
3855,0,25,0,0,0,0
3857,0,0,0,0,61,0
3863,0,0,0,14,0,0
3874,0,23,0,0,0,0
3876,0,0,0,7,0,0

Time Period	Internal								External								Total
	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	
AM (IN)	7.3%	13.5%	18.1%	0.0%	0.0%	0.0%	21.2%	5.7%	0.0%	14.5%	9.8%	9.8%	0.0%	0.0%	0.0%	0.0%	100.0%
AM (OUT)	30.6%	0.0%	13.0%	0.0%	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%	16.7%	23.2%	0.0%	0.0%	0.0%	100.0%
PM (IN)	18.6%	1.5%	13.6%	9.2%	11.9%	8.1%	2.2%	8.4%	0.0%	0.0%	12.3%	5.8%	3.1%	0.0%	0.0%	5.3%	100.0%
PM (OUT)	24.5%	10.5%	18.4%	8.8%	5.5%	10.9%	5.5%	11.9%	0.0%	0.0%	0.0%	4.1%	0.0%	0.0%	0.0%	0.0%	100.0%
SAT (IN)																	0.0%
SAT (OUT)																	0.0%

APPENDIX M:

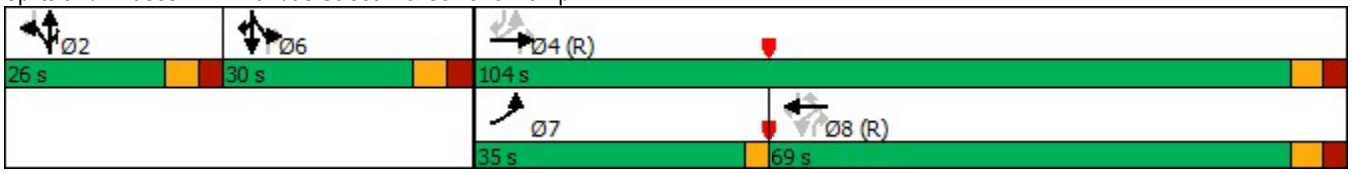
2027 Future Total Detailed Capacity Analyses

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1352	19	12	664	306	14	14	17	458	35	185
Future Volume (vph)	193	1352	19	12	664	306	14	14	17	458	35	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0		0.0	120.0		45.0	0.0		0.0	0.0		65.0
Storage Lanes	1		0	1		1	0		1	1		1
Taper Length (m)	100.0			15.0			7.6			100.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.998				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.976		0.950	0.959	
Satd. Flow (prot)	1789	3571	0	1789	5142	1601	0	1838	1601	1700	1716	1601
Flt Permitted	0.318			0.113				0.976		0.950	0.959	
Satd. Flow (perm)	599	3571	0	213	5142	1601	0	1838	1601	1700	1716	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				321						
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		121.4			559.2			44.8			197.1	
Travel Time (s)		7.3			33.6			3.4			14.2	
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
Adj. Flow (vph)	210	1470	21	13	722	333	15	15	18	498	38	201
Shared Lane Traffic (%)										46%		
Lane Group Flow (vph)	210	1491	0	13	722	333	0	30	18	269	267	201
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	custom	Split	NA	custom
Protected Phases	7	4			8		2	2	2	6	6	6
Permitted Phases	4			8		8			4 6 8			4 2 8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	36.0		36.0	36.0	36.0	15.0	15.0	15.0	15.5	15.5	15.5
Total Split (s)	35.0	104.0		69.0	69.0	69.0	26.0	26.0	26.0	30.0	30.0	30.0
Total Split (%)	21.9%	65.0%		43.1%	43.1%	43.1%	16.3%	16.3%	16.3%	18.8%	18.8%	18.8%
Maximum Green (s)	32.0	97.0		62.0	62.0	62.0	19.0	19.0	19.0	22.5	22.5	22.5
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		7.0	7.0	7.0		7.0	7.0	7.5	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0				0.0	0.0	0.0
Flash Dont Walk (s)		19.0		19.0	19.0	19.0				22.5	22.5	22.5
Pedestrian Calls (#/hr)		0		0	0	0				0	0	0
Act Effct Green (s)	99.1	95.1		78.4	78.4	78.4		8.8	160.0	37.6	37.6	160.0
Actuated g/C Ratio	0.62	0.59		0.49	0.49	0.49		0.06	1.00	0.24	0.24	1.00
v/c Ratio	0.44	0.70		0.12	0.29	0.35		0.30	0.01	0.68	0.66	0.13
Control Delay	16.7	25.2		31.8	32.4	9.8		80.0	0.0	65.6	65.0	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	25.2		31.8	32.4	9.8		80.0	0.0	65.6	65.0	0.2
LOS	B	C		C	C	A		F	A	E	E	A
Approach Delay		24.2			25.4			50.0			47.5	
Approach LOS		C			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 16 (10%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 29.7		Intersection LOS: C	
Intersection Capacity Utilization 82.8%		ICU Level of Service E	
Analysis Period (min) 15			

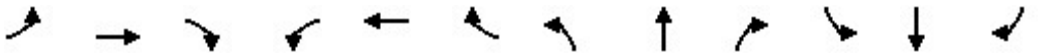
Splits and Phases: 1: Dundas Street E & Cawthra Ramp



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	1491	13	722	333	30	18	269	267	201
v/c Ratio	0.44	0.70	0.12	0.29	0.35	0.30	0.01	0.68	0.66	0.13
Control Delay	16.7	25.2	31.8	32.4	9.8	80.0	0.0	65.6	65.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	25.2	31.8	32.4	9.8	80.0	0.0	65.6	65.0	0.2
Queue Length 50th (m)	28.8	173.8	3.0	63.0	26.0	9.4	0.0	82.6	81.6	0.0
Queue Length 95th (m)	39.8	190.1	6.8	56.2	5.8	20.7	0.0	#130.1	#128.3	0.0
Internal Link Dist (m)		97.4		535.2		20.8			173.1	
Turn Bay Length (m)	75.0		120.0		45.0					65.0
Base Capacity (vph)	609	2196	104	2518	947	218	1601	398	403	1601
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	0.34	0.68	0.13	0.29	0.35	0.14	0.01	0.68	0.66	0.13

Intersection Summary

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

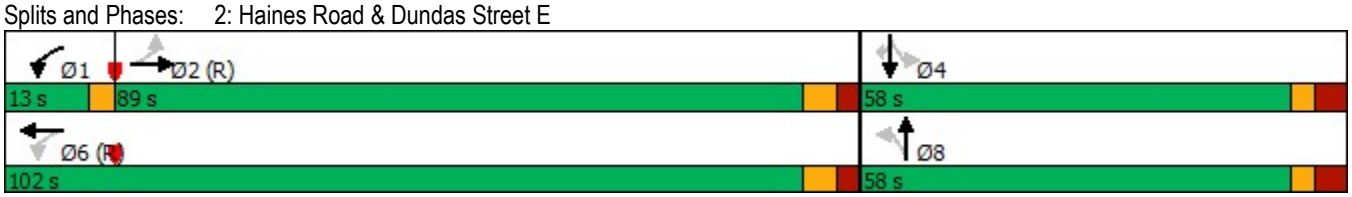


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	1820	159	201	746	77	63	15	141	99	32	102
Future Volume (vph)	109	1820	159	201	746	77	63	15	141	99	32	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.986			0.864				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5080	0	1789	5070	0	1789	1627	0	1789	1883	1601
Flt Permitted	0.306			0.042			0.734			0.430		
Satd. Flow (perm)	576	5080	0	79	5070	0	1382	1627	0	810	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			19			123				111
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	118	1978	173	218	811	84	68	16	153	108	35	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	2151	0	218	895	0	68	169	0	108	35	111
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		53.0	53.0	53.0
Total Split (s)	89.0	89.0		13.0	102.0		58.0	58.0		58.0	58.0	58.0
Total Split (%)	55.6%	55.6%		8.1%	63.8%		36.3%	36.3%		36.3%	36.3%	36.3%
Maximum Green (s)	82.0	82.0		10.0	95.0		51.0	51.0		51.0	51.0	51.0
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		6.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0		36.0	36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)	92.3	92.3		129.1	125.1		20.9	20.9		21.9	20.9	20.9
Actuated g/C Ratio	0.58	0.58		0.81	0.78		0.13	0.13		0.14	0.13	0.13
v/c Ratio	0.36	0.73		0.57	0.23		0.38	0.53		0.98	0.14	0.36
Control Delay	14.7	19.3		61.1	4.2		67.5	24.7		147.7	59.6	12.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.7	19.3		61.1	4.2		67.5	24.7		147.7	59.6	12.4
LOS	B	B		E	A		E	C		F	E	B
Approach Delay		19.1			15.3			37.0			76.4	
Approach LOS		B			B			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 22.9		Intersection LOS: C	
Intersection Capacity Utilization 86.0%		ICU Level of Service E	
Analysis Period (min) 15			

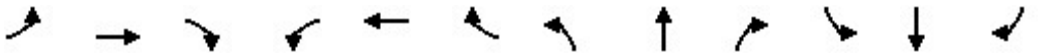
Splits and Phases: 2: Haines Road & Dundas Street E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	118	2151	218	895	68	169	108	35	111
v/c Ratio	0.36	0.73	0.57	0.23	0.38	0.53	0.98	0.14	0.36
Control Delay	14.7	19.3	61.1	4.2	67.5	24.7	147.7	59.6	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	19.3	61.1	4.2	67.5	24.7	147.7	59.6	12.4
Queue Length 50th (m)	11.6	172.8	53.8	17.9	20.1	13.3	34.8	10.0	0.0
Queue Length 95th (m)	m24.2	151.6	83.6	28.4	34.1	35.1	#60.3	19.9	17.2
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	332	2934	382	3968	440	602	263	600	585
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.73	0.57	0.23	0.15	0.28	0.41	0.06	0.19

Intersection Summary

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

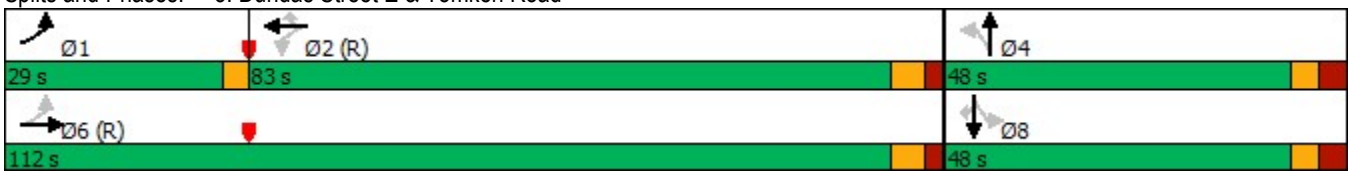


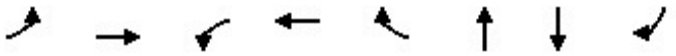
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	302	1638	8	7	648	222	4	6	17	326	11	274
Future Volume (vph)	302	1638	8	7	648	222	4	6	17	326	11	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.916				0.850
Flt Protected	0.950			0.950				0.993			0.954	
Satd. Flow (prot)	1789	5137	0	1789	5142	1601	0	1713	0	0	1797	1601
Flt Permitted	0.335			0.113				0.923			0.712	
Satd. Flow (perm)	631	5137	0	213	5142	1601	0	1592	0	0	1341	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				199		18				271
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	328	1780	9	8	704	241	4	7	18	354	12	298
Shared Lane Traffic (%)												
Lane Group Flow (vph)	328	1789	0	8	704	241	0	29	0	0	366	298
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	29.0	112.0		83.0	83.0	83.0	48.0	48.0		48.0	48.0	48.0
Total Split (%)	18.1%	70.0%		51.9%	51.9%	51.9%	30.0%	30.0%		30.0%	30.0%	30.0%
Maximum Green (s)	26.0	105.5		76.5	76.5	76.5	41.0	41.0		41.0	41.0	41.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			-2.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			5.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	109.0	105.5		85.4	85.4	85.4		41.0			43.0	41.0
Actuated g/C Ratio	0.68	0.66		0.53	0.53	0.53		0.26			0.27	0.26
v/c Ratio	0.59	0.53		0.07	0.26	0.25		0.07			1.02	0.49
Control Delay	17.3	10.0		21.9	20.8	5.1		24.3			108.2	10.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	17.3	10.0		21.9	20.8	5.1		24.3			108.2	10.1
LOS	B	A		C	C	A		C			F	B
Approach Delay		11.1			16.8			24.3			64.2	
Approach LOS		B			B			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 22.0		Intersection LOS: C	
Intersection Capacity Utilization 78.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Dundas Street E & Tomken Road





Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	328	1789	8	704	241	29	366	298
v/c Ratio	0.59	0.53	0.07	0.26	0.25	0.07	1.02	0.49
Control Delay	17.3	10.0	21.9	20.8	5.1	24.3	108.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	10.0	21.9	20.8	5.1	24.3	108.2	10.1
Queue Length 50th (m)	20.6	47.6	1.2	43.1	6.2	2.7	~122.4	6.6
Queue Length 95th (m)	61.8	80.2	4.8	55.4	21.6	11.3	#187.0	33.0
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	618	3387	113	2745	947	421	360	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.53	0.07	0.26	0.25	0.07	1.02	0.49

Intersection Summary

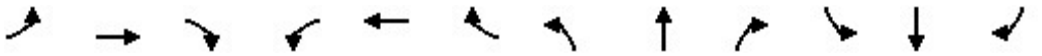
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	60	71	114	159	0
Future Volume (Veh/h)	0	60	71	114	159	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	65	77	124	173	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)				92		
pX, platoon unblocked	0.98					
vC, conflicting volume	451	173	173			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	427	173	173			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	95			
cM capacity (veh/h)	540	871	1404			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	65	201	173
Volume Left	0	77	0
Volume Right	65	0	0
cSH	871	1404	1700
Volume to Capacity	0.07	0.05	0.10
Queue Length 95th (m)	1.8	1.3	0.0
Control Delay (s)	9.5	3.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	3.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

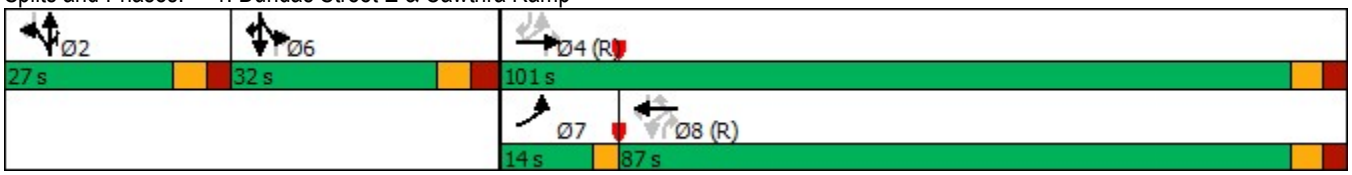


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	844	22	26	1572	620	37	21	83	291	23	320
Future Volume (vph)	197	844	22	26	1572	620	37	21	83	291	23	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0		0.0	120.0		45.0	0.0		0.0	0.0		65.0
Storage Lanes	1		0	1		1	0		1	1		1
Taper Length (m)	100.0			15.0			7.6			100.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.996				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.969		0.950	0.959	
Satd. Flow (prot)	1789	3564	0	1789	5142	1601	0	1825	1601	1700	1716	1601
Flt Permitted	0.073			0.304				0.969		0.950	0.959	
Satd. Flow (perm)	137	3564	0	573	5142	1601	0	1825	1601	1700	1716	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				335						
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		121.4			559.2			44.8			197.1	
Travel Time (s)		7.3			33.6			3.4			14.2	
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
Adj. Flow (vph)	214	917	24	28	1709	674	40	23	90	316	25	348
Shared Lane Traffic (%)										46%		
Lane Group Flow (vph)	214	941	0	28	1709	674	0	63	90	171	170	348
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	custom	Split	NA	custom
Protected Phases	7	4			8		2	2	2	6	6	6
Permitted Phases	4			8		8			4 6 8			4 2 8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	36.0		36.0	36.0	36.0	15.0	15.0	15.0	15.5	15.5	15.5
Total Split (s)	14.0	101.0		87.0	87.0	87.0	27.0	27.0	27.0	32.0	32.0	32.0
Total Split (%)	8.8%	63.1%		54.4%	54.4%	54.4%	16.9%	16.9%	16.9%	20.0%	20.0%	20.0%
Maximum Green (s)	11.0	94.0		80.0	80.0	80.0	20.0	20.0	20.0	24.5	24.5	24.5
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		7.0	7.0	7.0		7.0	7.0	7.5	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0				0.0	0.0	0.0
Flash Dont Walk (s)		19.0		19.0	19.0	19.0				22.5	22.5	22.5
Pedestrian Calls (#/hr)		0		0	0	0				0	0	0
Act Effct Green (s)	108.8	104.8		82.6	82.6	82.6		11.1	160.0	22.5	22.5	160.0
Actuated g/C Ratio	0.68	0.66		0.52	0.52	0.52		0.07	1.00	0.14	0.14	1.00
v/c Ratio	0.74	0.40		0.09	0.64	0.68		0.50	0.06	0.72	0.71	0.22
Control Delay	46.3	14.4		21.3	29.8	17.4		84.5	0.1	81.5	80.6	0.3
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	14.4		21.3	29.8	17.4		84.5	0.1	81.5	80.6	0.3
LOS	D	B		C	C	B		F	A	F	F	A
Approach Delay		20.3			26.3			34.8			40.3	
Approach LOS		C			C			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 16 (10%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 27.2		Intersection LOS: C	
Intersection Capacity Utilization 74.8%		ICU Level of Service D	
Analysis Period (min) 15			

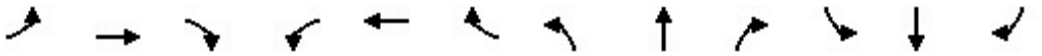
Splits and Phases: 1: Dundas Street E & Cawthra Ramp



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	214	941	28	1709	674	63	90	171	170	348
v/c Ratio	0.74	0.40	0.09	0.64	0.68	0.50	0.06	0.72	0.71	0.22
Control Delay	46.3	14.4	21.3	29.8	17.4	84.5	0.1	81.5	80.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	14.4	21.3	29.8	17.4	84.5	0.1	81.5	80.6	0.3
Queue Length 50th (m)	39.4	70.1	4.4	105.2	54.2	19.7	0.0	55.3	54.8	0.0
Queue Length 95th (m)	#105.0	100.6	m6.6	127.5	91.9	35.4	0.0	79.5	79.0	0.0
Internal Link Dist (m)		97.4		535.2		20.8			173.1	
Turn Bay Length (m)	75.0		120.0		45.0					65.0
Base Capacity (vph)	291	2336	295	2655	989	228	1597	276	278	1584
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	0.74	0.40	0.09	0.64	0.68	0.28	0.06	0.62	0.61	0.22

Intersection Summary

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

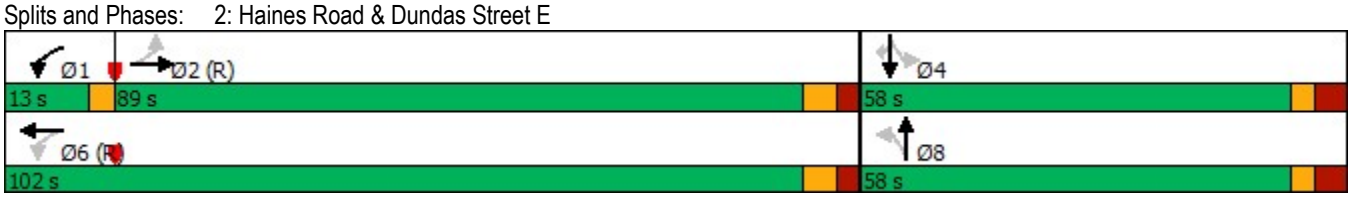


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	1036	110	213	2124	34	172	4	242	62	15	65
Future Volume (vph)	38	1036	110	213	2124	34	172	4	242	62	15	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.998			0.852				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5070	0	1789	5132	0	1789	1605	0	1789	1883	1601
Flt Permitted	0.056			0.181			0.747			0.255		
Satd. Flow (perm)	105	5070	0	341	5132	0	1407	1605	0	480	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			2			170				48
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	41	1126	120	232	2309	37	187	4	263	67	16	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1246	0	232	2346	0	187	267	0	67	16	71
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		53.0	53.0	53.0
Total Split (s)	89.0	89.0		13.0	102.0		58.0	58.0		58.0	58.0	58.0
Total Split (%)	55.6%	55.6%		8.1%	63.8%		36.3%	36.3%		36.3%	36.3%	36.3%
Maximum Green (s)	82.0	82.0		10.0	95.0		51.0	51.0		51.0	51.0	51.0
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		6.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0		36.0	36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)	102.8	102.8		122.8	118.8		27.2	27.2		28.2	27.2	27.2
Actuated g/C Ratio	0.64	0.64		0.77	0.74		0.17	0.17		0.18	0.17	0.17
v/c Ratio	0.61	0.38		0.61	0.62		0.78	0.64		0.80	0.05	0.23
Control Delay	52.6	8.9		28.0	7.4		84.6	28.3		115.5	51.7	22.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	52.6	8.9		28.0	7.4		84.6	28.3		115.5	51.7	22.5
LOS	D	A		C	A		F	C		F	D	C
Approach Delay		10.3			9.2			51.5			66.0	
Approach LOS		B			A			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 15.8		Intersection LOS: B	
Intersection Capacity Utilization 92.8%		ICU Level of Service F	
Analysis Period (min) 15			

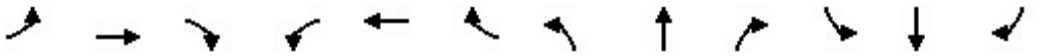
Splits and Phases: 2: Haines Road & Dundas Street E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	41	1246	232	2346	187	267	67	16	71
v/c Ratio	0.61	0.38	0.61	0.62	0.78	0.64	0.80	0.05	0.23
Control Delay	52.6	8.9	28.0	7.4	84.6	28.3	115.5	51.7	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	8.9	28.0	7.4	84.6	28.3	115.5	51.7	22.5
Queue Length 50th (m)	3.2	35.0	26.0	59.4	57.9	28.7	20.7	4.3	6.3
Queue Length 95th (m)	m#33.2	39.6	55.5	74.3	80.5	56.2	#40.0	10.6	19.4
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	67	3263	380	3810	448	627	156	600	543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.38	0.61	0.62	0.42	0.43	0.43	0.03	0.13

Intersection Summary

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

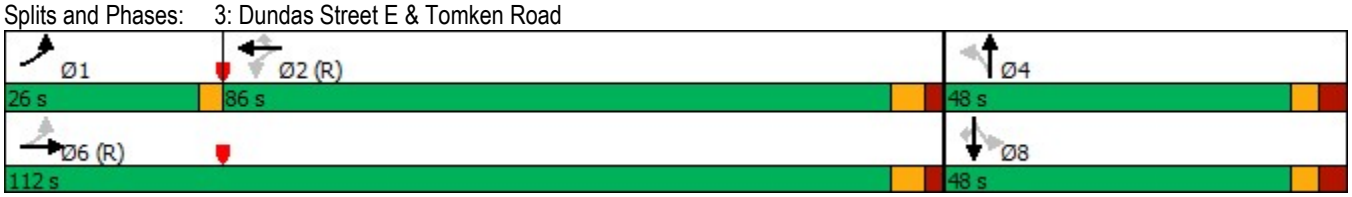


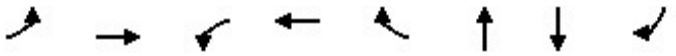
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	1149	45	35	1688	377	38	22	56	314	28	269
Future Volume (vph)	288	1149	45	35	1688	377	38	22	56	314	28	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.935				0.850
Flt Protected	0.950			0.950				0.984			0.956	
Satd. Flow (prot)	1789	5111	0	1789	5142	1601	0	1733	0	0	1801	1601
Flt Permitted	0.052			0.201				0.428			0.627	
Satd. Flow (perm)	98	5111	0	379	5142	1601	0	754	0	0	1181	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				135		28				250
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	313	1249	49	38	1835	410	41	24	61	341	30	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	313	1298	0	38	1835	410	0	126	0	0	371	292
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	26.0	112.0		86.0	86.0	86.0	48.0	48.0		48.0	48.0	48.0
Total Split (%)	16.3%	70.0%		53.8%	53.8%	53.8%	30.0%	30.0%		30.0%	30.0%	30.0%
Maximum Green (s)	23.0	105.5		79.5	79.5	79.5	41.0	41.0		41.0	41.0	41.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	109.0	105.5		79.5	79.5	79.5		41.0			41.0	41.0
Actuated g/C Ratio	0.68	0.66		0.50	0.50	0.50		0.26			0.26	0.26
v/c Ratio	1.01	0.38		0.20	0.72	0.48		0.59			1.23	0.49
Control Delay	116.1	9.5		26.1	33.5	19.0		52.8			176.6	11.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	116.1	9.5		26.1	33.5	19.0		52.8			176.6	11.9
LOS	F	A		C	C	B		D			F	B
Approach Delay		30.2			30.8			52.8			104.1	
Approach LOS		C			C			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 41.5		Intersection LOS: D	
Intersection Capacity Utilization 88.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Dundas Street E & Tomken Road





Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	313	1298	38	1835	410	126	371	292
v/c Ratio	1.01	0.38	0.20	0.72	0.48	0.59	1.23	0.49
Control Delay	116.1	9.5	26.1	33.5	19.0	52.8	176.6	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.1	9.5	26.1	33.5	19.0	52.8	176.6	11.9
Queue Length 50th (m)	~88.9	42.5	6.6	164.3	55.8	27.6	~144.8	10.3
Queue Length 95th (m)	#151.4	61.3	15.2	181.2	84.3	52.4	#209.3	37.5
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	309	3372	188	2554	863	214	302	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.38	0.20	0.72	0.48	0.59	1.23	0.49

Intersection Summary

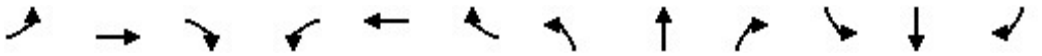
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	56	22	53	85	0
Future Volume (Veh/h)	0	56	22	53	85	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	61	24	58	92	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)				92		
pX, platoon unblocked						
vC, conflicting volume	198	92	92			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	198	92	92			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	98			
cM capacity (veh/h)	778	965	1503			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	61	82	92
Volume Left	0	24	0
Volume Right	61	0	0
cSH	965	1503	1700
Volume to Capacity	0.06	0.02	0.05
Queue Length 95th (m)	1.5	0.4	0.0
Control Delay (s)	9.0	2.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	2.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		



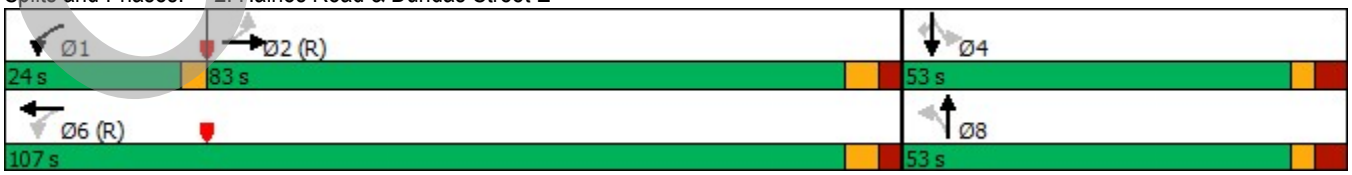
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	1820	159	201	746	77	63	15	141	99	32	102
Future Volume (vph)	109	1820	159	201	746	77	63	15	141	99	32	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.986			0.864				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5080	0	1789	5070	0	1789	1627	0	1789	1883	1601
Flt Permitted	0.306			0.049			0.734			0.434		
Satd. Flow (perm)	576	5080	0	92	5070	0	1382	1627	0	817	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			21			153				111
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	118	1978	173	218	811	84	68	16	153	108	35	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	2151	0	218	895	0	68	169	0	108	35	111
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4

OPTIMIZED

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		53.0	53.0	53.0
Total Split (s)	83.0	83.0		24.0	107.0		53.0	53.0		53.0	53.0	53.0
Total Split (%)	51.9%	51.9%		15.0%	66.9%		33.1%	33.1%		33.1%	33.1%	33.1%
Maximum Green (s)	76.0	76.0		21.0	100.0		46.0	46.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		6.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0		36.0	36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)	102.3	102.3		128.8	124.8		21.2	21.2		22.2	21.2	21.2
Actuated g/C Ratio	0.64	0.64		0.80	0.78		0.13	0.13		0.14	0.13	0.13
v/c Ratio	0.32	0.66		0.78	0.23		0.37	0.49		0.96	0.14	0.36
Control Delay	12.1	12.6		83.7	1.8		67.0	15.6		141.4	59.3	12.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	12.1	12.6		83.7	1.8		67.0	15.6		141.4	59.3	12.3
LOS	B	B		F	A		E	B		F	E	B
Approach Delay		12.6			17.8			30.4			73.7	
Approach LOS		B			B			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 86.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Haines Road & Dundas Street E



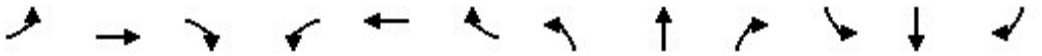
OPTIMIZED

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	118	2151	218	895	68	169	108	35	111
v/c Ratio	0.32	0.66	0.78	0.23	0.37	0.49	0.96	0.14	0.36
Control Delay	12.1	12.6	83.7	1.8	67.0	15.6	141.4	59.3	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	12.6	83.7	1.8	67.0	15.6	141.4	59.3	12.3
Queue Length 50th (m)	11.6	79.8	45.8	7.3	20.1	4.5	34.6	10.0	0.0
Queue Length 95th (m)	m24.9	133.5	81.5	12.6	34.0	25.4	#59.2	19.8	17.1
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	368	3252	313	3960	397	576	239	541	539
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.66	0.70	0.23	0.17	0.29	0.45	0.06	0.21

Intersection Summary

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

OPTIMIZED



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	302	1638	8	7	648	222	4	6	17	326	11	274
Future Volume (vph)	302	1638	8	7	648	222	4	6	17	326	11	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.916				0.850
Flt Protected	0.950			0.950				0.993			0.954	
Satd. Flow (prot)	1789	5137	0	1789	5142	1601	0	1713	0	0	1797	1601
Flt Permitted	0.317			0.107				0.952			0.712	
Satd. Flow (perm)	597	5137	0	202	5142	1601	0	1642	0	0	1341	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				137		8				298
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	328	1780	9	8	704	241	4	7	18	354	12	298
Shared Lane Traffic (%)												
Lane Group Flow (vph)	328	1789	0	8	704	241	0	29	0	0	366	298
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

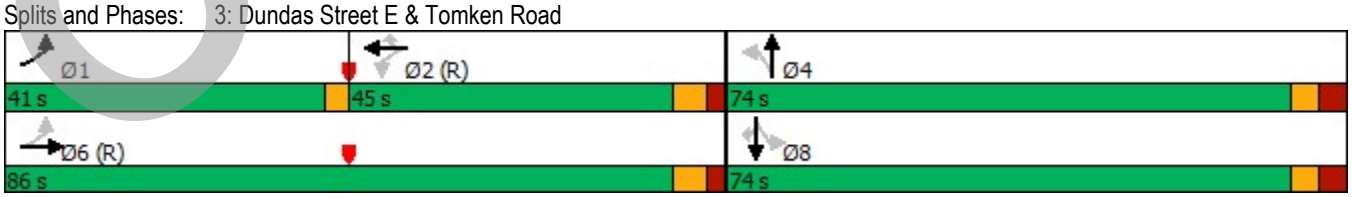
OPTIMIZED

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	41.0	86.0		45.0	45.0	45.0	74.0	74.0		74.0	74.0	74.0
Total Split (%)	25.6%	53.8%		28.1%	28.1%	28.1%	46.3%	46.3%		46.3%	46.3%	46.3%
Maximum Green (s)	38.0	79.5		38.5	38.5	38.5	67.0	67.0		67.0	67.0	67.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			-2.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			5.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	98.7	95.2		71.9	71.9	71.9		51.3			53.3	51.3
Actuated g/C Ratio	0.62	0.60		0.45	0.45	0.45		0.32			0.33	0.32
v/c Ratio	0.63	0.59		0.09	0.30	0.30		0.05			0.82	0.42
Control Delay	31.8	26.5		39.0	31.3	15.8		25.8			63.2	4.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	31.8	26.5		39.0	31.3	15.8		25.8			63.2	4.9
LOS	C	C		D	C	B		C			E	A
Approach Delay		27.4			27.5			25.8			37.1	
Approach LOS		C			C			C			D	

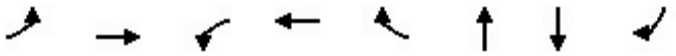
Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 29.1 Intersection LOS: C
Intersection Capacity Utilization 78.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Dundas Street E & Tomken Road



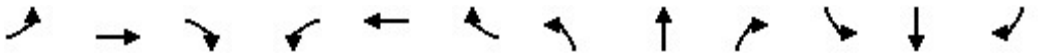
OPTIMIZED



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	328	1789	8	704	241	29	366	298
v/c Ratio	0.63	0.59	0.09	0.30	0.30	0.05	0.82	0.42
Control Delay	31.8	26.5	39.0	31.3	15.8	25.8	63.2	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	26.5	39.0	31.3	15.8	25.8	63.2	4.9
Queue Length 50th (m)	49.2	101.7	1.5	51.7	19.3	4.6	106.1	0.0
Queue Length 95th (m)	107.7	170.2	7.0	79.9	50.9	10.9	130.7	18.4
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	651	3055	90	2311	795	692	578	843
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.59	0.09	0.30	0.30	0.04	0.63	0.35

Intersection Summary

OPTIMIZED



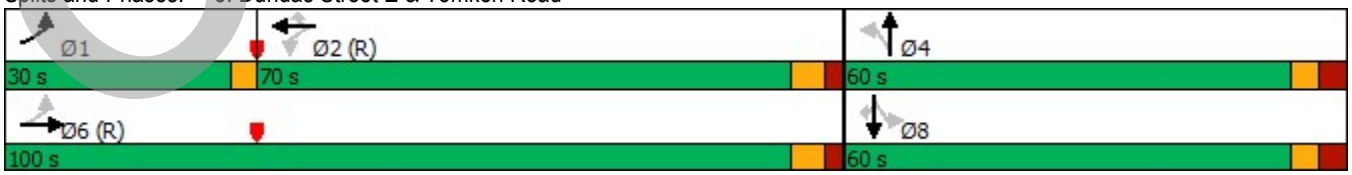
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	1149	45	35	1688	377	38	22	56	314	28	269
Future Volume (vph)	288	1149	45	35	1688	377	38	22	56	314	28	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		30.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	35.0			40.0			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.935				0.850
Flt Protected	0.950			0.950				0.984			0.956	
Satd. Flow (prot)	1789	5111	0	1789	5142	1601	0	1733	0	0	1801	1601
Flt Permitted	0.057			0.201				0.586			0.642	
Satd. Flow (perm)	107	5111	0	379	5142	1601	0	1032	0	0	1209	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				113		32				291
Link Speed (k/h)		60			60			48			50	
Link Distance (m)		412.2			702.4			80.2			421.2	
Travel Time (s)		24.7			42.1			6.0			30.3	
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
Adj. Flow (vph)	313	1249	49	38	1835	410	41	24	61	341	30	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	313	1298	0	38	1835	410	0	126	0	0	371	292
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2		2	4			8		8

OPTIMIZED

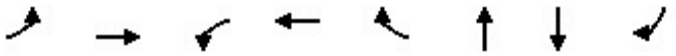
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6		2	2	2	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5	30.5	43.0	43.0		43.0	43.0	43.0
Total Split (s)	30.0	100.0		70.0	70.0	70.0	60.0	60.0		60.0	60.0	60.0
Total Split (%)	18.8%	62.5%		43.8%	43.8%	43.8%	37.5%	37.5%		37.5%	37.5%	37.5%
Maximum Green (s)	27.0	93.5		63.5	63.5	63.5	53.0	53.0		53.0	53.0	53.0
Yellow Time (s)	3.0	4.0		4.0	4.0	4.0	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.0	2.5		2.5	2.5	2.5	3.5	3.5		3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	3.0	6.5		6.5	6.5	6.5		7.0			7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)		14.0		14.0	14.0	14.0	26.0	26.0		26.0	26.0	26.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	98.9	95.4		66.9	66.9	66.9		51.1			51.1	51.1
Actuated g/C Ratio	0.62	0.60		0.42	0.42	0.42		0.32			0.32	0.32
v/c Ratio	0.94	0.43		0.24	0.85	0.56		0.36			0.96	0.41
Control Delay	99.3	18.0		37.6	47.7	29.1		33.4			89.9	5.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	99.3	18.0		37.6	47.7	29.1		33.4			89.9	5.7
LOS	F	B		D	D	C		C			F	A
Approach Delay		33.8			44.2			33.4			52.8	
Approach LOS		C			D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 41.6		Intersection LOS: D	
Intersection Capacity Utilization 88.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Dundas Street E & Tomken Road



OPTIMIZED



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	313	1298	38	1835	410	126	371	292
v/c Ratio	0.94	0.43	0.24	0.85	0.56	0.36	0.96	0.41
Control Delay	99.3	18.0	37.6	47.7	29.1	33.4	89.9	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	18.0	37.6	47.7	29.1	33.4	89.9	5.7
Queue Length 50th (m)	89.4	62.9	8.1	199.7	74.3	22.4	114.2	0.2
Queue Length 95th (m)	#140.2	94.2	18.5	220.1	109.6	41.7	#177.1	20.9
Internal Link Dist (m)		388.2		678.4		56.2	397.2	
Turn Bay Length (m)	15.0		20.0		30.0			
Base Capacity (vph)	349	3050	158	2148	734	363	400	724
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.43	0.24	0.85	0.56	0.35	0.93	0.40

Intersection Summary

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

OPTIMIZED

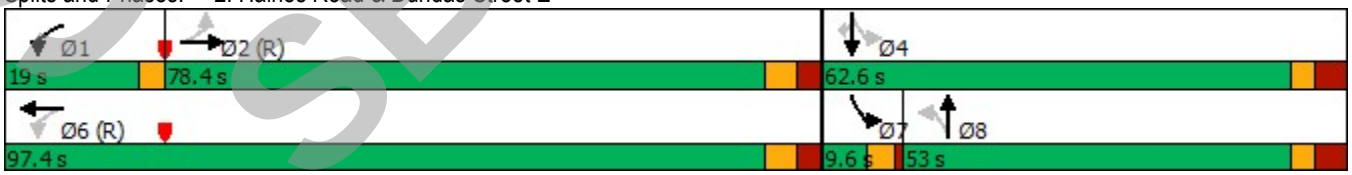
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	1820	159	201	746	77	63	15	141	99	32	102
Future Volume (vph)	109	1820	159	201	746	77	63	15	141	99	32	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	75.0		0.0	25.0		25.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	35.0			20.0			50.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.986			0.864				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	5080	0	1789	5070	0	1789	1627	0	1789	1883	1601
Flt Permitted	0.306			0.045			0.734			0.226		
Satd. Flow (perm)	576	5080	0	85	5070	0	1382	1627	0	426	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			18			153				111
Link Speed (k/h)		60			60			50			40	
Link Distance (m)		559.2			412.2			198.5			92.1	
Travel Time (s)		33.6			24.7			14.3			8.3	
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
Adj. Flow (vph)	118	1978	173	218	811	84	68	16	153	108	35	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	2151	0	218	895	0	68	169	0	108	35	111
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6			8			4		4

SENSITIVITY
SBL ADVANCE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8	8		7	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0		5.0	8.0	8.0
Minimum Split (s)	44.0	44.0		10.0	44.0		53.0	53.0		9.5	53.0	53.0
Total Split (s)	78.4	78.4		19.0	97.4		53.0	53.0		9.6	62.6	62.6
Total Split (%)	49.0%	49.0%		11.9%	60.9%		33.1%	33.1%		6.0%	39.1%	39.1%
Maximum Green (s)	71.4	71.4		16.0	90.4		46.0	46.0		5.1	55.6	55.6
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.5	3.0	3.0
All-Red Time (s)	3.0	3.0		0.0	3.0		4.0	4.0		1.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		-1.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		3.0	7.0		7.0	7.0		3.5	7.0	7.0
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)	10.0	10.0			10.0		10.0	10.0			10.0	10.0
Flash Dont Walk (s)	27.0	27.0			27.0		36.0	36.0			36.0	36.0
Pedestrian Calls (#/hr)	0	0			0		0	0			0	0
Act Effct Green (s)	98.2	98.2		127.0	123.0		13.4	13.4		26.5	23.0	23.0
Actuated g/C Ratio	0.61	0.61		0.79	0.77		0.08	0.08		0.17	0.14	0.14
v/c Ratio	0.33	0.69		0.73	0.23		0.59	0.61		0.89	0.13	0.34
Control Delay	13.5	15.0		79.1	2.2		90.1	22.4		115.4	59.0	12.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	13.5	15.0		79.1	2.2		90.1	22.4		115.4	59.0	12.0
LOS	B	B		E	A		F	C		F	E	B
Approach Delay		14.9			17.3			41.8			62.5	
Approach LOS		B			B			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 84.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Haines Road & Dundas Street E



SENSITIVITY
SBL ADVANCE

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	118	2151	218	895	68	169	108	35	111
v/c Ratio	0.33	0.69	0.73	0.23	0.59	0.61	0.89	0.13	0.34
Control Delay	13.5	15.0	79.1	2.2	90.1	22.4	115.4	59.0	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	15.0	79.1	2.2	90.1	22.4	115.4	59.0	12.0
Queue Length 50th (m)	12.5	94.2	46.9	7.9	21.2	4.8	31.0	9.9	0.0
Queue Length 95th (m)	m23.2	132.2	82.3	15.2	37.1	27.9	#59.8	20.1	17.4
Internal Link Dist (m)		535.2		388.2		174.5		68.1	
Turn Bay Length (m)	30.0		20.0		75.0		25.0		25.0
Base Capacity (vph)	353	3123	299	3902	397	576	122	654	628
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.69	0.73	0.23	0.17	0.29	0.89	0.05	0.18

Intersection Summary

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

SENSITIVITY
SBL ADVANCE

APPENDIX N:

City of Mississauga Zoning By-Law Excerpts

You are printing a partial view of the Mississauga Interactive Zoning By-law 0225-2007 on 6/16/2023, 2:22:00 PM based on your selection(s). This information is provided for convenience purposes only as it may not reflect recently approved amendments. To view the entire Interactive Zoning By-law, visit www.mississauga.ca/zoningbylaw

Mississauga Zoning By-law 0225-2007 (In Effect)

Disclaimer about print version.Disclaimer: The online version of Zoning By-law 0225-2007 is provided for convenience purposes only as it may not reflect recently approved amendments. Review unconsolidated by-law amendments. It should not be relied on when making decisions in connection with real estate transactions, development proposals or building permits.

3 Parking, Loading, Stacking Lane and Bicycle Parking Regulations

3.1 Parking, Loading, Stacking Lane and Bicycle Parking Regulations

3.1.1 Parking Regulations

3.1.1.9 Alternative Gross Floor Area Deductions for Non-Residential Uses

For the purposes of calculating required parking for a non-residential use, gross floor area, as defined by this By-law, may be used instead of gross floor area - non-residential as contained in Table 3.1.2.2 of this By-law and the following deductions to the total gross floor area calculated shall apply: 2% for manufacturing facility and **warehouse/distribution facility**, wholesaling facility, 10% for office and medical office uses and 5% for all other non-residential uses.

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
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 Required Number of Parking Spaces

3.1.2.1 Required Number of Parking Spaces for Residential Uses

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)

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
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*

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)

3.1.2.1.3 Shared Arrangement for Residential Visitor and Non-Residential Parking Component

For the purpose of Article 3.1.2.1 of this By-law, a shared parking arrangement may be used for the calculation of required residential visitor/non-residential parking in accordance with the following:
(0117-2022)

the greater of
(1) Visitor spaces per unit in accordance with applicable regulations contained in Table 3.1.2.1 of this By-law;
or
(2) Parking required for all non-residential uses, located in the same building or on the same lot as the residential use, except banquet hall/conference centre/convention centre, entertainment establishment, overnight accommodation, place of religious assembly, recreational establishment and restaurant over 220 m^2 GFA - non-residential.

Parking for banquet hall/conference centre/convention centre, entertainment establishment, overnight accommodation, place of religious assembly, recreational establishment and restaurant over 220 m^2 GFA - non-residential shall not be included in the above shared parking arrangement and shall be provided in accordance with applicable regulations contained in Table 3.1.2.2 of this By-law.

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)

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 GFA - 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	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 Accessible Parking Spaces

3.1.3.1 Required Number of Accessible Parking Spaces

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.*

3.1.3.1.1

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 Bicycle Parking Regulations

(0118-2022)

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

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	College, University (within CC1 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
6.0	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
7.0	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
8.0	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
9.0	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
10.0	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
11.0	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
12.0	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
13.0	Office	0.1 spaces per 100 m^2 GFA - non-residential	0.1 spaces per 100 m^2 GFA - non-residential
14.0	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

15.0	Public/Private School	0.1 spaces per 100 m^2 GFA - non-residential	0.4 spaces per 100 m^2 GFA - non-residential
16.0	Public/Private School (within CC1 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
17.0	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
18.0	All other non-residential uses (within CC1 to CC4 and CCO zones)	0.05 spaces per 100 m^2 GFA - non-residential	0.10 spaces per 100 m^2 GFA - non-residential

APPENDIX O:

TTS Query Results – Mode Split

Mon May 16 2022 13:03:33 GMT-0400 (Eastern Daylight Time) - Run Time: 3118ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of household - gta06_hhld
Column: Primary travel mode of trip - mode_prime

Filters:
(2006 GTA zone of household - gta06_hhld In 3669,3674,3673,3668,3670
and
Primary travel mode of trip - mode_prime Not In O,S,9,M)

Trip 2016
Table:

,Transit excluding GO rail,Cycle,Auto driver,GO rail only,Joint GO rail and local transit,Auto passenger,Taxi passenger,Paid rideshare,Walk
3668,1620,164,9069,144,29,1852,0,52,696
3669,2915,0,13963,449,139,2980,57,39,1130
3670,1740,53,8072,101,0,1459,113,48,1843
3673,378,0,3307,38,0,698,0,0,0
3674,1172,24,9865,190,126,2103,119,0,920

GTA Zone	Transit excluding GO rail	Cycle	Auto driver	GO rail only	Joint GO rail and local transit	Auto passenger	Taxi passenger	Paid rideshare	Walk
3668	1620	164	9069	144	29	1852	0	52	696
3669	2915	0	13963	449	139	2980	57	39	1130
3670	1740	53	8072	101	0	1459	113	48	1843
3674	1172	24	9865	190	126	2103	119	0	920
Total	7447	241	40969	884	294	8394	289	139	4589
%	12%	0%	65%	1%	0%	13%	0%	0%	7%

Non-auto modal split 35%