TRANSPORTATION IMPACT STUDY

795 BRANT STREET

CITY OF BURLINGTON
REGION OF HALTON

PREPARED FOR:

CAMARRO DEVELOPMENTS INC.

PREPARED BY:
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SEPTEMBER 2022

CFCA FILE NO. 2321-6440

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CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev.0	September 2022	Issued for Submission

1.0 Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Camarro Developments Inc. (the Applicant) to undertake a Transportation Impact Study (TIS) for the proposed mixed-use residential development situated at 789 & 795 Brant Street in the City of Burlington, Halton Region. This study has been prepared in accordance with requirements set out per Halton Region's Guidelines for TIS. The findings and recommendations regarding traffic-related impacts of the proposed development are presented herein.

The analysis undertaken herein was completed using the Draft Site Plan prepared by RAW Design dated August 26, 2022. Any minor changes to the Site Plan are not expected to materially affect the conclusions set out within this report.

The project proposes the construction of a 31-storey mixed-use development with 356 residential units, a mechanical penthouse, a 7-storey podium, 485 m^2 of ground-floor retail, and a total of 279 vehicle parking spaces. Additionally, a full-movement access is proposed to serve the site from Prospect Street.

Under 2022 existing conditions, the study intersections operate with a Level of Service "B" or better with the exception of the intersection of Brant Street and Fairview Street operating with a Level of Service "C" and "D" for A.M. and P.M. peak hours respectively. Notably the eastbound through movement operates near capacity during the A.M. peak hour with eastbound left-turn movement and northbound through movement operating near capacity during P.M. peak hour. The westbound through lane is expected to exceed the capacity during P.M. peak hour. A lost time adjustment of 4.0 seconds is incurred for the westbound through movements to reflect existing operating conditions.

For the intersection of Brant Street and Fairview Street, the 95th percentile queue length for the eastbound left-turn movements exceed the available storage during both A.M. and P.M. peak and northbound left-turn lane exceeds storage only during the P.M. peak hour.

Under 2027 future background traffic, the study intersections operate with a Level of Service "B" with the exception of the intersection of Brant Street and Fairview Street operating with a Level of Service "C" and "D" for A.M. and P.M. peak hours, respectively. Notably the movements are expected to operate similarly to the 2022 Existing conditions with an addition of southbound through lane forecasted to operate near capacity during the P.M. peak period. Additionally, the eastbound left-turn lane and westbound left-turn lane 95th percentile queue lengths at the intersection of Brant Street and Prospect Street/Grahams Lane are forecasted to exceed the available storage during the P.M. peak hour.

The proposed mixed-use development is forecasted to generate approximately 97 two-way trips (33 inbound and 64 outbound) during the weekday A.M. peak hour, and 115 two-way trips (64 inbound and 51 outbound) during the P.M. peak hour.

The future total operations at the study intersections are anticipated to be very similar to that of the future background operations forecasted for the 2027 horizon year except for the intersection of Brant Street and Fairview Street as the Level of Service degraded to "E" by a 1.0 second small increase in average delay and the northbound left movement expecting to operate over capacity in the P.M. peak hour. It is noted that the site access is expected to anticipate operating well under capacity with a Level of Service "B" or better.

The sightlines at the proposed accesses on Prospect Street were conducted using the guidance provided by the Transportation Association of Canada (TAC) with no sightline issues noted. Additionally, corner clearance and access spacing were verified at each access and are expected to be sufficient.

Vehicle maneuvering analysis was undertaken for the site and no issues were noted for the fire, waste, loading or passenger vehicle movements on the ground floor. However, in the underground parking garage some parking spaces are designated as small car spaces since they would not be able to accommodate large passenger vehicles such as pick-up trucks.

The proposed parking supply at the site is below the City's By-Law requirements but can be supported based on the prepared Parking Justification, which reviewed the recent development precedent within Burlington. Additionally, TDM measures have been recommended to support the reduced parking supply and promote the use of transit.

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2.0 Introduction

Camarro Development Inc. (the Applicant) retained C.F. Crozier & Associates Inc. (Crozier) to undertake a Transportation Impact Study (TIS) to support the Official Plan Amendment (OPA), Zoning By-Law Amendment (ZBA) and Plan of Subdivision applications for the site at 789 & 795 Brant Street, in the City of Burlington, Halton Region.

The purpose of this study is to evaluate the impacts of the planned development on the surrounding road network and recommend traffic-related mitigation measures, if warranted. This study has been completed following the procedures set out within the Halton Region's Transportation Impact Study Guidelines, dated December 2015.

A term of reference encompassing the following conditions was confirmed with staff at the City of Burlington (the City) and Halton Region (Region) in July 2022. Correspondence between Crozier and the City are included in Appendix A.

The following horizon and timeframes were included in this study:

- Existing (2022) traffic conditions
- Five-year study horizon and anticipated build-out year (2027) for future traffic conditions
- A.M. and P.M. peak hours

The following intersections were reviewed as part of the study area:

- Fairview Street and Brant Street (Signalized)
- Brant Street and Prospect Street/Grahams Ln (Signalized)
- Brant Street and Ghent Avenue (Signalized)
- Prospect Street and Robinson Street/ Private Access
- Proposed site access via Prospect Street

3.0 Development Proposal

Per the most recent Site Plan prepared by RAW, the elements envisioned for the proposed 31-storey mixed-use residential building include:

- 354 residential units
- 485 m^2 of ground floor retail
- A total of 5 underground parking levels consisting of 279 parking spaces.
- A total of 178 long-term and 18 short-term bicycle parking spaces.
- One (1) full-movement site access to Prospect Street

The Site Plan is included in Appendix B.

4.0 Existing Conditions

4.1 Development Lands

The subject lands encompass an area of approximately 0.22 ha, and currently consists of two (2) existing two-storey employment buildings. The property is located within a mixed-use commercial and residential neighborhood and is bound by existing residential properties to the east, a commercial property to the south, Brant Street to the west, and Prospect Street to the north. As per the City of Burlington Zoning By-Law 2020, the subject property is currently zoned Mixed-Use Corridor (MXG).

The location of the Site is included in **Figure 1**.

4.2 Boundary Road Network

4.2.1 Study Roadways

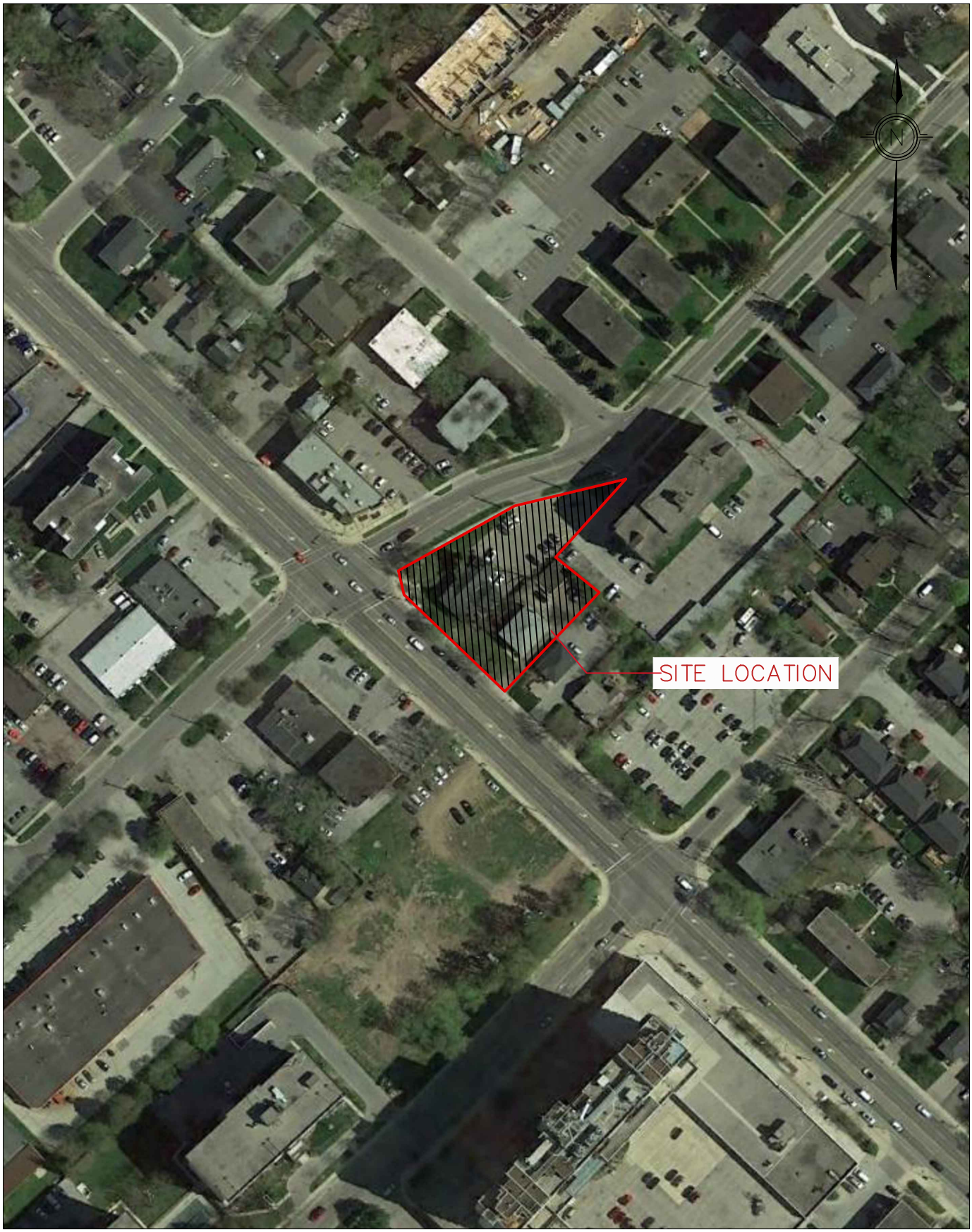
Brant Street is a north-south roadway. Brant Street is a multi-purpose arterial roadway and has a 6-lane cross section with a posted speed limit of 60 km/h north of Fairview Street and is a minor arterial roadway with a 4-lane cross-section and a posted speed limit of 50km/h south of Fairview Street. Brant Street has one-southbound lane and two-northbound lanes south of Ghent Avenue. It also consists of a center Two-Way Left-Turn Lane (TWLTL) and has sidewalks as well as bicycle lanes on both sides of the road within the study area.

Fairview Street is an east-west multi-purpose arterial roadway with a posted speed limit of 60km/h. It has 3 westbound and 3 eastbound lanes. Sidewalks and bicycle lane are available on both sides of the roadway.

Prospect Street/Grahams Lane is an east-west collector roadway with a posted speed limit of 40km/h. Prospect Street has one westbound and one eastbound lane with bicycle lane on north side of the roadway. Graham lane ends at cul-de-sac west of Brant Street and consists of Sidewalk and sharrow pavement marking on south side of the roadway.

Ghent Avenue is an east-west local roadway with a posted speed limit of 40km/h. It has one westbound and one eastbound lane with sidewalks on both sides of the roadway. No bicycle lanes are observed, and cyclist have to share path with vehicles. Paid on-street parking is available on both sides of the roadway west of Brant Street.

Robinson Street is north-south roadway with a posted speed limit of 40km/h. No bicycle lanes are observed, and sidewalks are available on both sides of the roadway.



Legend

= SUBJECT LANDS

Project

795 BRANT STREET
CITY OF BURLINGTON

Drawing

SITE LOCATION

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Suite 100
Milton, ON, L9T 6P4
905-875-0026 T
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info@cfcrozier.ca

Drawn By	Design By	Project	
A.D.			2321-6440
Scale	Date	Check By	Drawing
N.T.S.	09/08/2022	B.B.	FIG. 1

4.2.2 Study Intersections

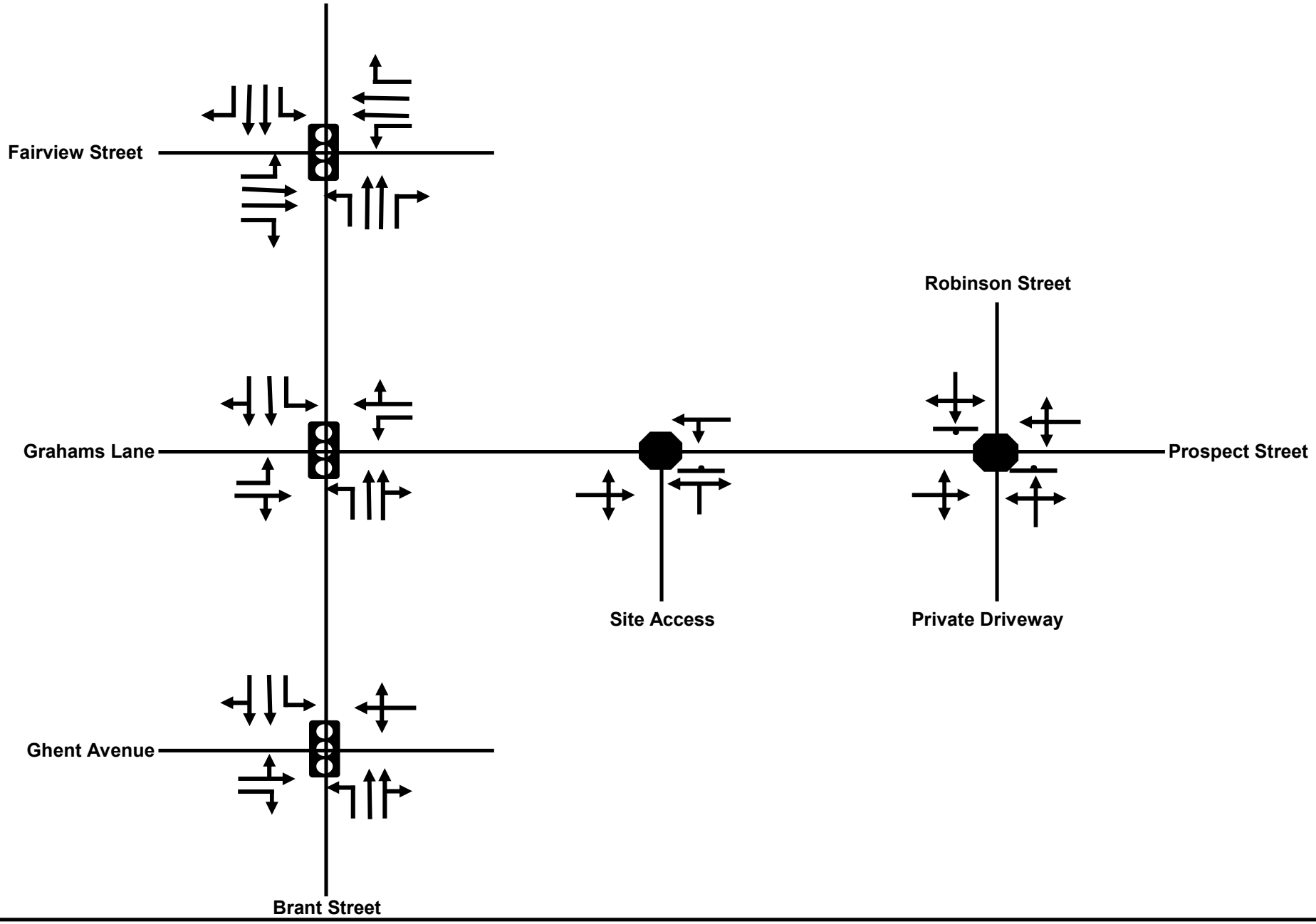
The intersection of **Brant Street and Fairview Street** is a four-legged signalized intersection. The northbound and southbound approach on Brant Street consists of a double through lane, a single auxiliary left-turn lane and a single channelized right-turn lane. The westbound and eastbound approach on Fairview Street also consists of a double through lane, a single auxiliary left-turn lane and a single channelized right-turn lane.

The intersection of **Brant Street and Prospect Street/Grahams Lane** is a four-legged signalized intersection. The southbound and northbound approach on Brant Street each consists of a shared through/right-turn lane, a single through lane, and an auxiliary left-turn lane. The eastbound approach on Grahams Lane and westbound approach on Prospect Street consists of a shared through/right-turn lane and an auxiliary left-turn lane.

The intersection of **Brant Street and Ghent Avenue** is a four-legged signalized intersection. The northbound and southbound approach on Brant Street consists of a shared through/right-turn lane, a single through lane, and an auxiliary left-turn lane. The westbound approach on Ghent Avenue Consists of a shared through/left-turn lane and an auxiliary right-turn lane. The eastbound approach on Ghent Avenue consists of shared through/left-turn/right-turn lane.

The intersection of **Prospect Street and Robinson Street/Private Access** is a four-legged stop-controlled intersection. The north, south, west and eastbound approach consists of a single shared through/left-turn/right-turn lane.

Figure 2 illustrates the configuration of the existing boundary roadways.



Legend	795 Brant Street	CROZIER CONSULTING ENGINEERS	FIGURE 02
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	STUDY ROADWAYS		Project No. 2321-6440 Date. 44729 Analyst. Aarzoo D

4.3 Existing Transit

Transit service is available in vicinity of the proposed development. Burlington GO station is situated on Fairview Street, east of Brant Street and approximately 1.0 km from the proposed development with walking distance about 13 min and cycling distance about 6 min. The GO station offers GO Transit train and GO Transit bus services. Several Burlington Transit routes provide connectivity to GO station.

The Burlington GO station serves extensive parking facilities on both north and south of the station with designated pick up/drop off area. The south side of the station is also connected by wheelchair accessible tunnels under the tracks.

The Lakeshore WEST GO train service offers frequent train travel from Burlington GO station between Hamilton and Toronto with trains planned to operate every 15 minutes during the peak periods but currently operating every 30 minutes. Go Bus Route 18C and 18F Lakeshore West service the station off-peak hours of the train service.

Table 1 represents the existing transit routes served by Burlington Transit along Fairview Street and Brant Street:

Table 1: Burlington Transit Routes

Bus Routes	Transit Stops	Time		
		Weekday	Headway (Weekday Peak Hour)	Weekend
Route 2 (Downtown Terminal to Highway 407 Carpool Lot)	Brant Street at Prospect Street	5:23 AM – 10:23 PM	6:23 AM – 9:53 AM Every 15 min	6:23 AM – 9:53 PM (Saturday)
			2:23 PM – 6:38 PM Every 15 min	7:53 AM – 8:23 PM (Sunday)
Route 2 (Highway 407 Carpool Lot to Downtown Terminal)		5:28 AM – 10:58 PM	6:27 AM – 9:57 AM Every 15 min	7:00 AM – 10:30 PM (Saturday)
			2:27 PM – 7:27 PM Every 15 min	8:00 AM – 8:30 PM (Sunday)
Route 52 (Headon Forest to Burlington Go)		11:41 PM and 12:41 PM (Mon – Sat)	60 min	Saturday Only, same as weekday

4.4 Existing Active Transportation Network

The subject site is situated within one of the City of Burlington's three Mobility Hubs, per the City's Cycling Plan. There is a well-established cyclist network available in the vicinity of the proposed development.

- Brant Street: On-street bicycle lanes are available on both sides of the street throughout the study area.

- Prospect Street: On-street bicycle lane is available on north side of the street. Sharrow pavement marking is provided on south side of the street.
- Grahams Lane: A sharrow pavement marking is available on south side of the street.
- Fairview Street: On-street bicycle lanes are available on both sides of the street.

The City's existing cycling network is included within **Appendix C.**

As mentioned earlier in the report, sidewalks are available on both sides of all the study roadways except for Grahams Lane which has sidewalks only on north side. There are several transit nodes that are also accessible via sidewalks.

4.5 Traffic Data

Turning movement counts conducted by Halton Region, City of Burlington and Spectrum are considered for the transportation impact analysis, following confirmation with the City and Region during pre-consultation. The counts were extracted from the Transportation Impact Study prepared by Paradigm for the Molinaro lands located in the vicinity of the site except for the intersection of Robinson Street and Prospect Street, which was collected by Spectrum on Crozier's behalf.

Turning movement counts for the study intersection and their respective count dates are shown in the **Table 2** below:

Table 2: Turning Movement Counts

Intersection	Counting Agency	Year
Fairview Street and Brant Street	Halton Region	May 2018
Brant Street and Prospect Street/Grahams Lane	City of Burlington	May 2019
Brant Street and Ghent Avenue	City of Burlington	May 2019
Robinson Street and Prospect Street	Spectrum	July 2021

A linear growth rate of 1.0% for traffic movements along the Brant Street and Fairview Street as well as the intersection of Brant Street & Fairview Street was confirmed with City staff during pre-consultation. Peak hour factors used for analysis were assumed to be consistent with those presented in the Paradigm report.

4.6 Traffic Modeling

The evaluation of intersections within this report is conducted based on the methodology outlined in the Highway Capacity Manual, 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 stop-controlled intersections is included **in Appendix D.**

4.7 Intersection Operations

The traffic operations at the study intersections were analyzed based on grown traffic volumes to represent 2022 traffic conditions during the weekday A.M. and P.M. peak hours, as illustrated in **Figure 3.** Detailed capacity analyses are included in **Appendix E**.

Table 3 summarizes the existing traffic operations within the study area.

Table 3: 2022 Existing Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay (s)	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Fairview Street at Brant Street	Signal	A.M.	C	30.2	**0.86 (EBT)**	EBL 70 > 30 m
		P.M.	D	45.6	**0.97 (EBL)** **1.02 (WBT)** **0.87 (NBT)**	EBL 90 m > 30 m NBL 95 m > 25 m
Brant Street at Prospect Street/ Grahams Lane	Signal	A.M.	A	9.4	0.45 (SBT)	None
		P.M.	B	17.1	0.84 (EBL)	None
Brant Street at Ghent Avenue	Signal	A.M.	A	9.8	0.67 (EBT)	None
		P.M.	B	11.9	0.69 (EBT)	None
Robinson Street at Private Access	Stop Control (Minor)	A.M.	B	10.2 (NB)	0.03 (SB)	None
		P.M.	B	11.5 (NB)	0.04 (SB)	None

Note 1: The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach. The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided in the Paradigm Report were used.

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through and shared through/turning movements, and 0.95 for exclusive turning lanes are highlighted.

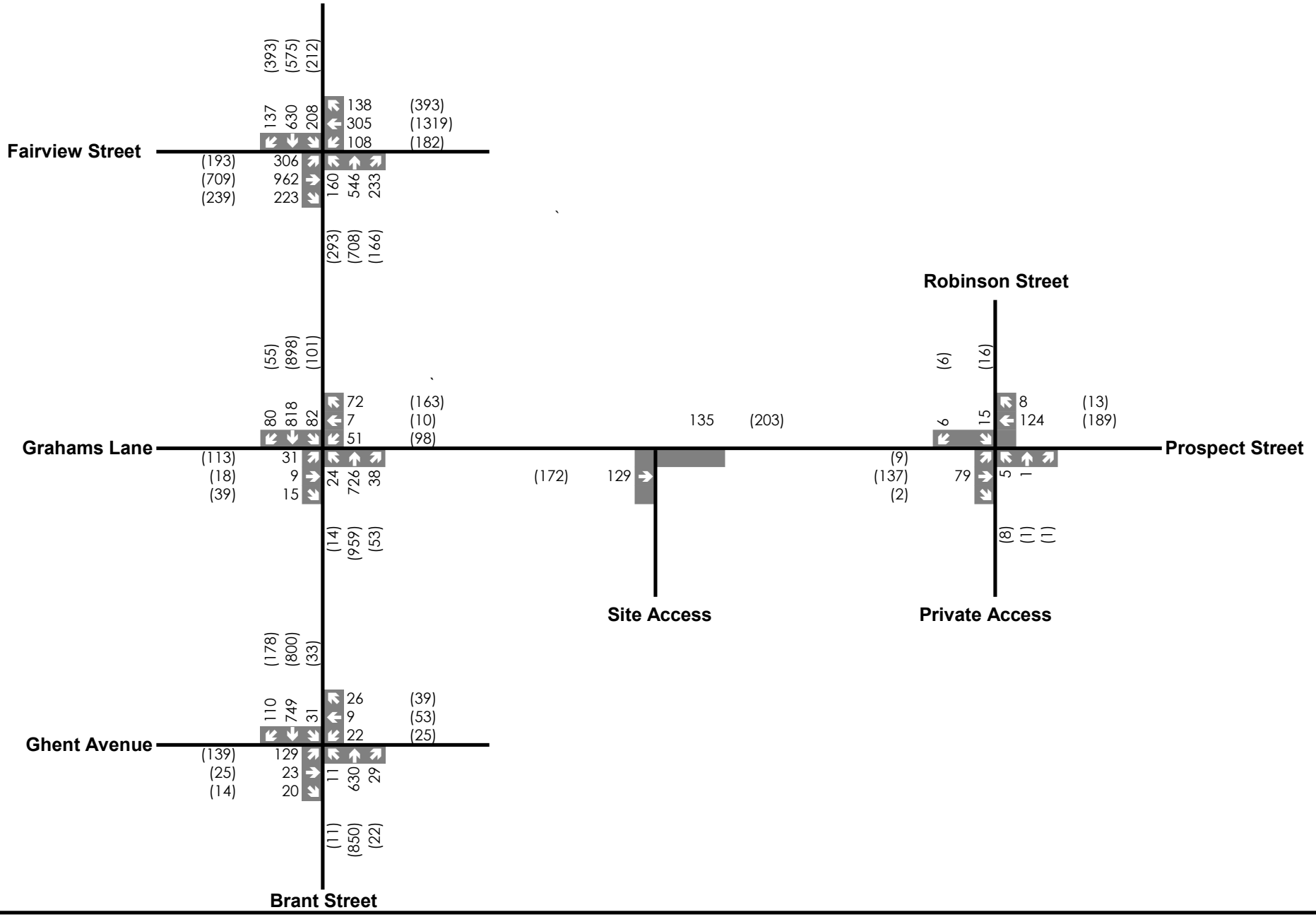
The intersection of Fairview Street and Brant Street currently operates with a Level of Service "C" and "D" during the weekday A.M. and P.M. peak hours, respectively.

In the A.M. peak hour, the eastbound through lane is approaching capacity and the eastbound left-turn movements are expected to exceed the available storage length. In the P.M. peak hour, the eastbound left turn and northbound through movements are also operating near

capacity, while the westbound through movement is expected to operate above capacity. Eastbound and northbound left turn 95th percentile queues are also expected to significantly exceed the available storage.

It is noted that the westbound through movement operating above capacity is due to the mismatch between the date of the signal timing plans (2016) and the date the traffic counts were collected (2018). As a result, a lost time adjustment of -4.0 seconds was applied to the westbound through movement to better reflect existing operations.

The remaining intersections of Brant Street at Prospect Street/Grahams Lane, Brant Street at Ghent Avenue and Robison Street at Private Access operate under capacity with a Level of Service "B" or better.



Legend	795 Brant Street	CROZIER CONSULTING ENGINEERS	FIGURE 03
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	2022 Existing Traffic Volumes		Project No. 2321-6440 Date. 44729 Analyst. Aarzoo D

5.0 Future Background Conditions

5.1 Study Horizons

Per consultation with the City of Burlington, the following horizon years were selected to assess the impacts of the proposed development on the surrounding road network:

- Five-year horizon and anticipated development full build out: 2027

Future background traffic volumes for horizon years consist of the following components:

- Background traffic growth from outside the study area.
- Traffic generated within the study area from other proposed developments.

Per confirmation with the City and Region, an annual linear growth rate of 1.0% is applied for through traffic movements along Fairview Street and Brant Street.

5.2 Background Developments

Background developments identified within the Transportation Impact Study dated December 2017 situated at 2095 Prospect Street and May 2021 situated at Brant Street and Ghent Avenue were used as background developments within this report, including the site trips forecasted in relation to that site. The background developments identified within the vicinity of the proposed development are summarized in **Table 4** below.

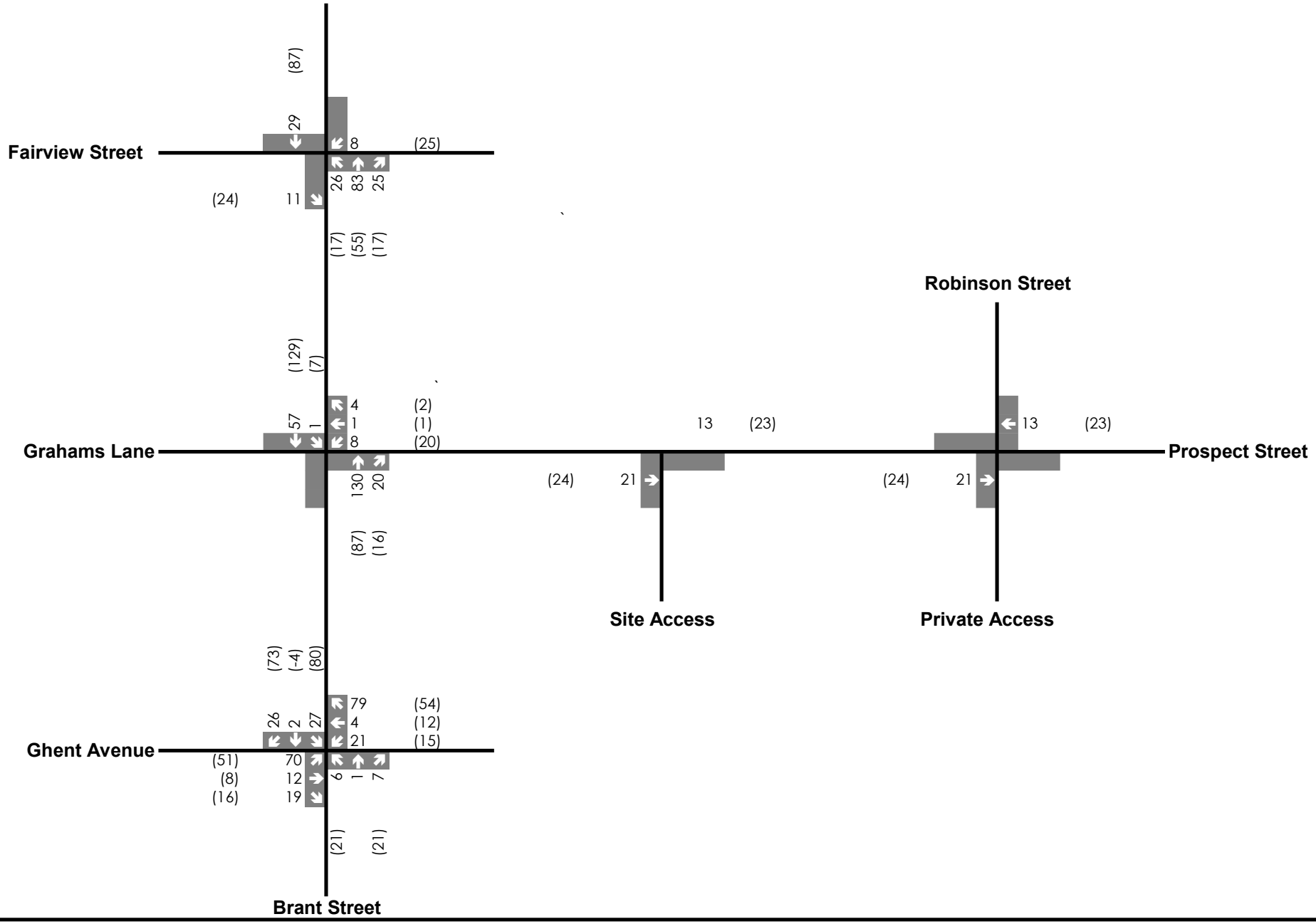
Table 4: Background Developments

Reference Number	Development Address	Type of Development
505-19/17 & 505-09/17 (OPA & ZBA)	2087 & 2103 Prospect Street	Residential
505-06/21 & 505-07/21 (OPA & ZBA)	Molinaro Group Lands consisting of: Parcel A (774, 778, 780, 782 Brant Street) Parcel B (769,779,783 Brant Street & 2023, 2027, 2031, 2033 Ghent Avenue) Parcel C (741, 761 Brant Street)	Mixed-use Residential

The background development by Molinaro Group Lands is expected to be build out in phases with anticipated year of build out for phase 1, phase 2 and phase 3 to be 2027, 2028 and 2029 respectively. It is noted that while phases 2 and 3 are expected to be built-out beyond the horizon year of 2027, they have been included in the analysis contained herein to provide a conservative analysis of future total traffic operations.

All trips generated by background developments are summarized in **Figure 4.**

The individual background trip assignments on the study road network have been provided in **Appendix F.**



Legend	795 Brant Street	CROZIER CONSULTING ENGINEERS	FIGURE 04
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	Trip Assignment		Project No. 2321-6440 Date. 44729 Analyst. Aarzoo D

5.3 Intersection Operations

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. Volumes anticipated for the future background conditions for the 2027 are included in **Figure 5**.

Table 5 summarizes the 2027 future background Levels of Service and queue analysis for all peak periods and horizon years. **Appendix G** includes detailed capacity analysis for the future background analysis.

Table 5: 2027 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay (s)	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Fairview Street at Brant Street	Signal	A.M.	C	32.8	**0.90 (EBT)**	EBL 70 > 30 m
		P.M.	D	54.7	**1.04 (EBL)** **1.07 (WBT)** **0.89 (NBT)** **0.86 (SBT)**	EBL 90 m > 30 m NBL 130 m > 25 m
Brant Street at Prospect Street/ Grahams Lane	Signal	A.M.	B	10.7	0.50 (SBT)	None
		P.M.	B	17.1	0.84 (EBL)	EBL 50 > 30 m WBL 40 > 20 m
Brant Street at Ghent Avenue	Signal	A.M.	B	14.0	0.79 (EBT)	None
		P.M.	B	16.0	0.82 (EBT)	None
Robinson Street at Private Access	Stop Control (Minor)	A.M.	B	10.5 (NB)	0.03 (SB)	None
		P.M.	B	12.0 (NB)	0.04 (SB)	None

Note 1: The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach. The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided in the Paradigm Report were used.

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through and shared through/turning movements, and 0.95 for exclusive turning lanes are highlighted.

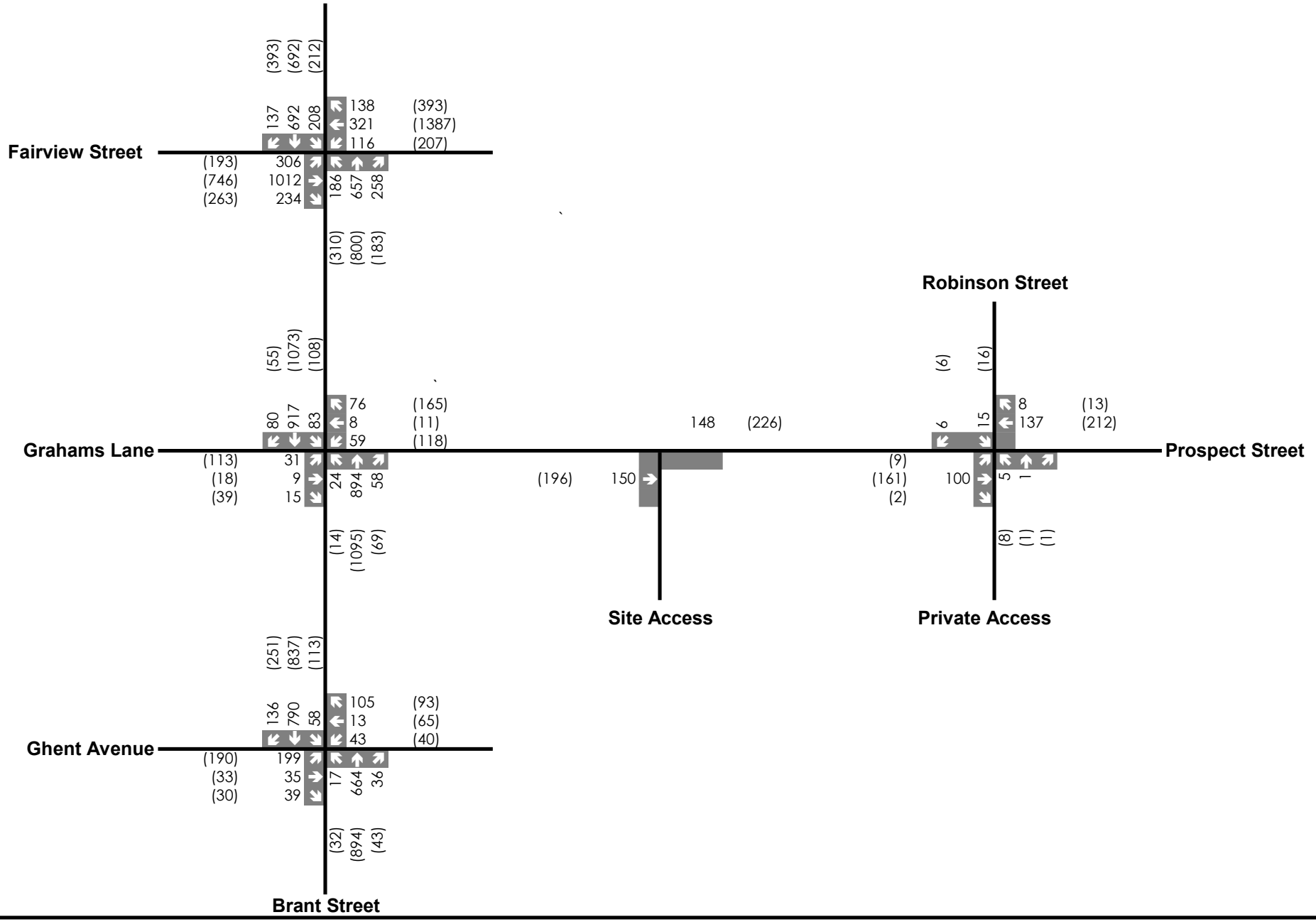
The intersection of Fairview Street and Brant Street is forecasted to operate with a Level of Service "C" and "D" during the weekday A.M. and P.M. peak hours, respectively similar to the 2022 existing conditions.

Additionally, the eastbound through movements are expected to operate above capacity in the morning peak hour. The eastbound left-turn, northbound through and southbound through movements are forecasted to operate at critical capacities during the afternoon peak hour, while the westbound through movement forecasted to keep operating above capacity similar to the existing conditions.

The 95th percentile queue lengths are forecasted to exceed the available storage length similar to the existing conditions except for increase in queue length for northbound left-turn movement by 35.0 metres.

The intersection of Brant Street at Prospect Street/Grahams Lane is forecasted to operate under capacity with acceptable delays. The 95th percentile queue length for eastbound and westbound left-turn lane is expected to exceed the storage length, however, the 50th percentile queue length is expected to be within the available storage length. It is further noted that while the eastbound left-turn lane is only painted for approximately 30 metres, there is sufficient road width to allow for additional eastbound left-turn queuing while allowing through and right-turn movements to slip around the queued vehicles.

The remaining intersections Brant Street at Ghent Avenue and Robison Street at Private Access are expected to operate under capacity with a Level of Service "B" in both peak hours.



Legend	795 Brant Street	CROZIER CONSULTING ENGINEERS	FIGURE 05
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	2027 Future Background Volumes		Project No. 2321-6440 Date. 44729 Analyst. Aarzoo D

6.0 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network that would otherwise not exist. The development will also result in additional turning movements at the intersections.

6.1 ITE Trip Generation

Site-generated traffic for the proposed development was calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, using Land Use Category (LUC) 222 "Multifamily Housing (High-Rise)" Not Close to Rail Transit even though the development is close to Burlington Go station due to limited number of studies. The fitted curve equation was used to determine a conservative estimate of the peak hour trips generated at the site. No modal split reductions were applied to site-generated trips for a more conservative representation of site-generated trips.

Notably, site generated trips for the retail portion of the development are expected to primarily from residents of the building and is not expected to generate a significant number of trips due to small area occupied by the retail space. As such, additional trip generation was not conducted for the retail portion of the development.

The site-generated trips forecasted at the proposed development are summarized in **Table 6.**

Table 6: ITE Trip Generation

ITE Category	Units	Roadway Peak Hour	Rate/Equation Used	Number of Trips		
				Inbound	Outbound	Total
Multifamily Housing (High-Rise) (LUC 222)	356 units	Weekday A.M.	T = 0.22 (X) + 18.85	33	64	97
		Weekday P.M.	T = 0.26 (X) + 23.12	64	51	115

The proposed development is expected to generate approximately 97 two-way trips (33 inbound and 64 outbound) during the weekday A.M. peak hour, and 115 two-way trips (64 inbound and 51 outbound) during the P.M. peak hour.

The transportation analysis was conducted using the architectural plan dated August 17, 2022, which represented 354 residential units. However, the plans were updated on August 26, 2022, reflecting a total of 356 units. It is observed that increase in 2 units does not materially impact the site generated traffic.

6.2 Trip Distribution and Assignment

The trips generated by the residential portion of the development were distributed to the boundary roadways based on Transportation Tomorrow Survey (TTS) data.

TTS is a comprehensive survey of transportation characteristics of households in the Golden Horseshoe and surrounding areas. 2016 Transportation Tomorrow Survey (TTS) data, provided in **Appendix H,** was used to determine the trip distribution for the proposed residential development.

The subject property is situated in 2006 GTA Zone 4059, which contains a mixture of residential and commercial sites.

Additionally, to determine a more accurate representation of trips entering and exiting the surrounding area, data for GTA Zones 4057, 4058, 4060 and 4062 adjacent to Zone 4059 were used in combination with the subject site zone.
TTS results were filtered from these three zones to reflect trip distribution patterns during the weekday peak periods.

Notably, trips were filtered for the A.M. peak period (between 6:30 A.M. and 9:30 A.M.) for trips originating and exiting the five GTA Zones analyzed, with the trip purpose in relation to leaving or entering "Home".

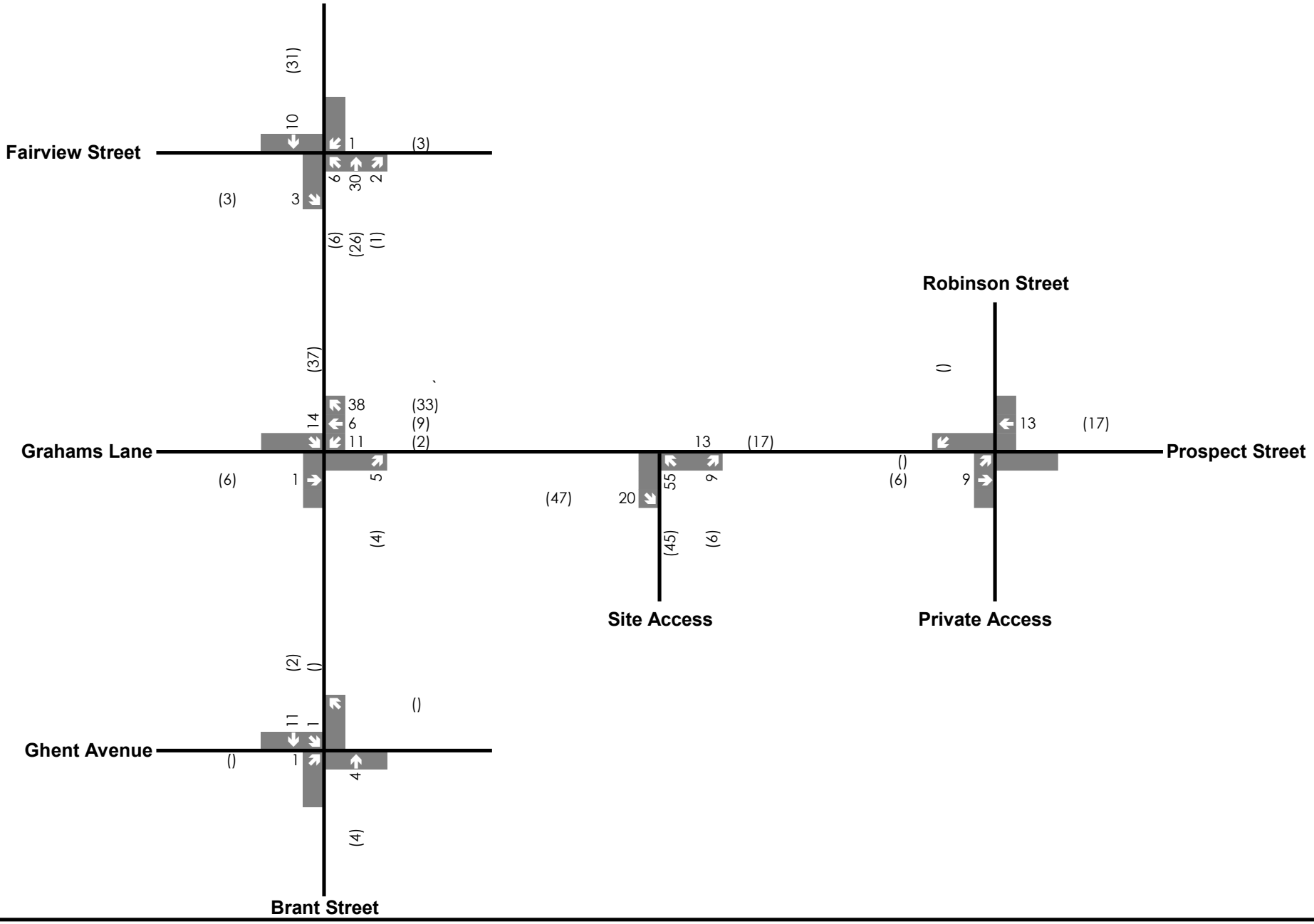
Additionally, trips were filtered to only include persons between the age of 18-99 and excluding uncommon or unknown modes of travel (school buses, unknown or other trips). Trips were similarly filtered during the P.M. peak period, for the timeframe between 3:30 P.M. and 6:30 P.M.

Table 7 below outlines the trip distribution for the proposed residential development, divided into time and direction of travel.

Table 7: Trip Distribution

Direction	A.M. Inbound	A.M. Outbound	P.M. Inbound	P.M. Outbound
Northwest	29%	2%	9%	11%
North	0%	9%	3%	13%
Northeast	11%	13%	22%	16%
East	43%	23%	45%	17%
Southeast	5%	17%	5%	5%
South	0%	0%	0%	0%
Southwest	10%	27%	6%	20%
West	2%	9%	9%	18%
Total	**100%**	**100%**	**100%**	**100%**

The site trip distribution is included in **Appendix H.** The assignment of site-generated trips per the noted distribution is presented in **Figure 6.**



Legend	795 Brant Street	CROZIER CONSULTING ENGINEERS	FIGURE 06
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	Site Generated Trips		Project No. 2321-6440 Date. 44729 Analyst. Aarzoo D

7.0 Total Traffic Conditions

The future total traffic volumes for the one (1) horizon year consist of the following components:

- Future Background traffic volumes from the corresponding year.
- Proposed development site generated traffic volumes.

The resulting total volumes in the horizon year 2027 are presented in **Figure 7.**

7.1 Intersection Operations

The results of the 2027 future total traffic conditions and queue analysis are summarized in **Table 8.** Detailed capacity analysis worksheets are included in **Appendix I.**

The intersection of Fairview Street and Brant Street is forecasted to operate similarly to future background conditions with Level of Service (LOS) "C" for the morning peak hour, however the P.M. peak hour LOS has deteriorated to "E" as a result of a small 1.0 second increase in average delay at the intersection.

During the A.M. peak hour, the eastbound through lane is forecasted to operate near capacity and the 95th percentile queue length for eastbound, northbound and southbound left-turns are forecasted to exceed the available storage.

During the P.M. peak hour, the eastbound left-turn, northbound left-turn and westbound through movements are forecasted to operate above capacity. Northbound and southbound through movements are also approaching capacity and are considered critical.

Furthermore, the 95th percentile queue length for the eastbound, northbound and westbound left-turn movements are expected to exceed the available storage.

The intersection of Brant Street at Prospect Street/Grahams Lane is forecasted to operate under capacity with acceptable delays. The 95th percentile queue length for eastbound left-turn and westbound left-turn is expected to exceed the storage length however the 50th percentile queue length is expected to be within the available storage length for the eastbound and westbound left-turn movements.

Furthermore, considering the width of the roadway, the storage length for eastbound left-turn and westbound left-tun can be extended by 15 and 25 m respectively by repainting the lanes on prospect roadway.

The remaining intersections of Brant Street at Ghent Avenue and Robison Street at Private Access are expected to operate under capacity with a Level of Service "B".

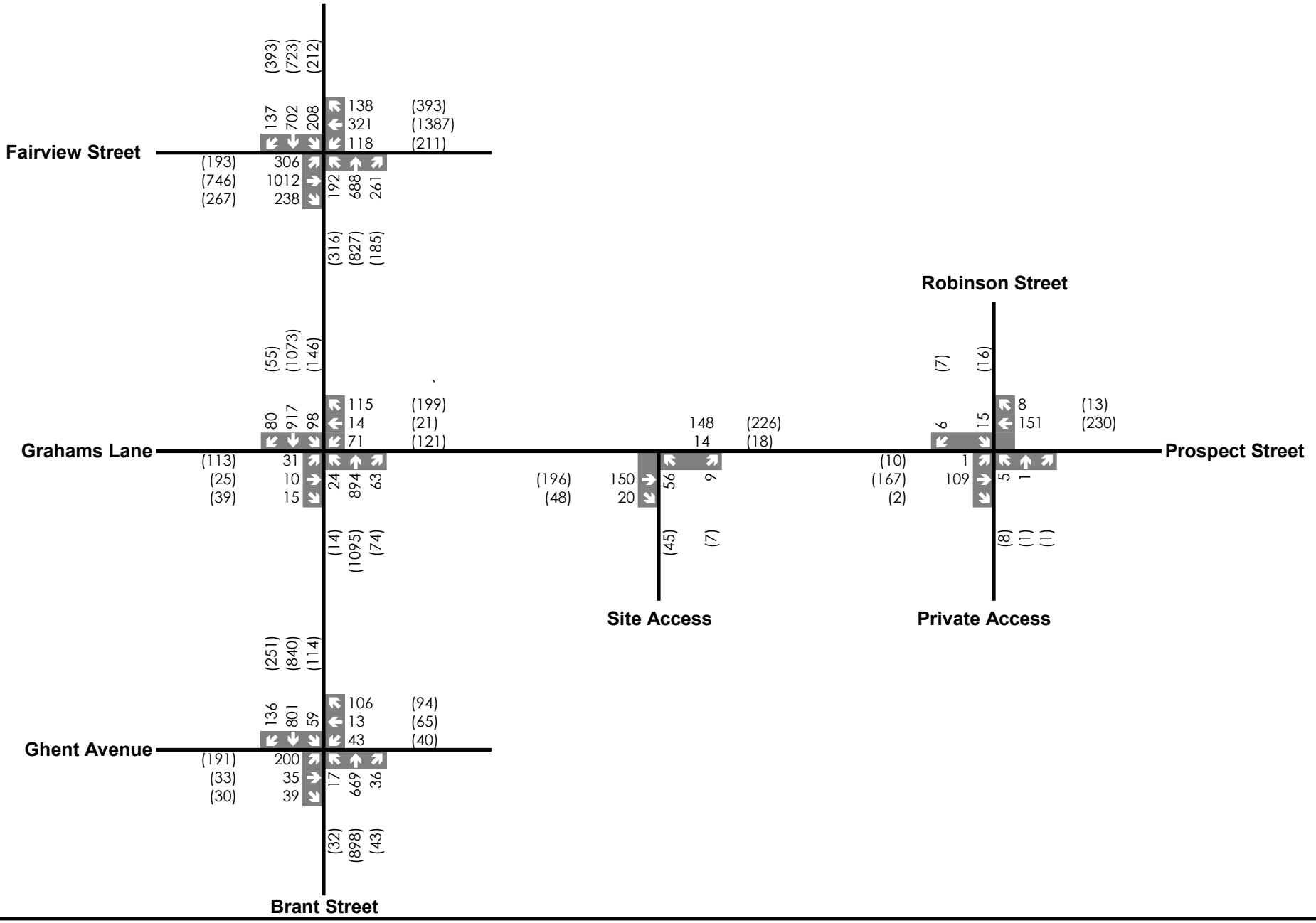
The site access is expected to operate to operate well under capacity with a Level of Service "B" during the A.M. and P.M. peak hours.

Table 8: 2027 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay (s)	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Fairview Street at Brant Street	Signal	A.M.	C	33.4	**0.90 (EBT)**	EBL 70 > 30 m NBL 55 > 25 m SBL 50 > 40 m
		P.M.	E	55.9	**1.03 (EBL)** **1.07 (WBT)** **1.03 (NBL)** **0.92 (NBT)** **0.89 (SBT)**	EBL 90 m > 30 m WBL 55 > 30 m NBL 130 m > 25 m
Brant Street at Prospect Street/ Grahams Lane	Signal	A.M.	B	12.0	0.55 (SBT)	None
		P.M.	B	19.8	0.92 (EBL)	EBL 55 > 30 m WBL 45 > 20 m
Brant Street at Ghent Avenue	Signal	A.M.	B	14.0	0.79 (EBT)	None
		P.M.	B	16.0	0.82 (EBT)	None
Robinson Street at Private Access	Stop Control (Minor)	A.M.	B	10.7 (NB)	0.03 (SB)	None
		P.M.	B	12.3 (NB)	0.05 (SB)	None
Site Access at Prospect Street	Stop Control (Minor)	A.M.	B	11.1 (NB)	0.11 (NB)	None
		P.M.	B	12.5 (NB)	0.16 (EB)	None

Note 1: The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach. The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided in the Paradigm Report were used.

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through and shared through/turning movements, and 0.95 for exclusive turning lanes are highlighted.



Legend	795 Brant Street	CROZIER CONSULTING ENGINEERS	FIGURE 07
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	2027 Future Total Traffic Volumes		Project No. 2321-6440 Date. 44729 Analyst. Aarzoo D

7.2 Intersection Operations with Improvements

Based on the results of the intersection operations using the existing lane configurations and signal timing plans, some improvements were recommended to improve the traffic operations at the intersections of Brant Street with Fairview Street and with Prospect Street/Grahams Lane.

7.2.1 Brant Street and Fairview Street

It is noted that the overcapacity movement and queue lengths at the intersection of Brant Street and Fairview Street can mostly be attributed to:

- The "existing" overcapacity movements, which are mostly expected due to the mis-matched signal timing plans and traffic count data. The growth of the movements is also likely overestimated since the base existing volume from the year 2018 is expected to be greater than the current capacity; and

- The forecasted background trips associated with the surrounding background developments.

  Note: The developments by the Molinaro Group Lands also known as Parcel B and Parcel C are expected to be buildout by the year 2028 and 2029 respectively after the buildout of the proposed site which is 2027. However, the parcels are considered within the analysis contained herein to test the intersection capacity for a worst-case scenario.

  This is evident given the movements expected to be overcapacity are those by the background developments.

To improve operations at the intersection, an additional southbound and northbound lane were added to the existing intersection configuration to mitigate the capacity concerns. No changes to cycle length are proposed to maintain corridor coordination. The optimized capacity analysis is shown **in Table 9.**

Table 9: 2027 Future Total Optimized Lane Configuration

Intersection	Level of Service (Average Delay Per Vehicle(s))		Critical V/C Ratios[2]		95th Percentile Queue Length > Storage Length	
	Previous	Improved	Previous	Improved	Previous	Improved
Brant Street and Fairview Street **(AM Peak)**	C (33.4)	C (30.8)	**0.90 (EBT)**	**0.89 (EBT)**	EBL 70 > 30 m NBL 55 > 25 m SBL 50 > 40 m	EBL 70 > 30 m
Brant Street and Fairview Street **(PM Peak)**	E (55.9)	(50.8)	**1.03 (EBL)** **1.07 (WBT)** **1.03 (NBL)** **0.92 (NBT)** **0.89 (SBT)**	**0.97 (EBL)** **0.92 (WBT)** **0.97 (NBL)** **0.99 (NBT)** **0.99 (SBT)**	EBL 90 > 30 m NBL 130 > 25 m WBL 55 > 30 m	EBL 85 > 30 m NBL 70 > 25 m SBL 50 > 30 m

The implementation of mitigation measures would improve the operations of the intersection of Brant Street and Fairview Street and reduce the severity of the overcapacity eastbound through, westbound through and northbound left-turn movements.

However, most movements are still expected to be critical during the P.M. peak hour. Therefore, the improvements would only provide a marginal improvement at a significant cost to the City. Furthermore, traffic patterns since the collection of the 2018 counts may not be reflective of the current post-pandemic reality, which has generally reduced travel during the peak hours. Therefore, the analysis is considered conservative and a worst-case scenario.

Additionally, the capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic. Thus, optimizing the signal timings to provide additional green time and adjust signal timings is recommended to mitigate delay and capacity.

7.2.2 Brant Street and Prospect Street/Grahams Lane

For the intersection of the Brant Street and Prospect Street/ Grahams Lane to accommodate the 95th percentile queue length for the eastbound left-turn movement and westbound left-turn lane, an additional 15 metres of storage for eastbound left-turn and 25 metres of storage for westbound left-turn will suffice the traffic volume. The lane is required to be repainted between Brant Street at Prospect Street and Robinson Street to provide a 45 metres westbound left-turn lane.

8.0 Site Access Analysis

The following section provides a review of geometric properties of the proposed site accesses with reference to the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), June 2017, as well as any municipal or regional design guidelines. This section specifically analyzes the proposed accesses from a sight distance and access spacing perspective to ensure adequate visibility and sufficient spacing to avoid conflicts have been provided. It also highlights the design vehicles for site circulation showing maneuverability throughout the site.

8.1 Access Spacing

Per Figure 8.8.2 in the TAC GDGCR, the minimum required corner clearances from a signalized intersection to a public driveway along a collector road is 55.0 meters. The distance of the proposed access to the existing intersection of Brant Street and Prospect Street/Grahams Lane is approximately 56 m. As such, the spacing of the proposed access is sufficient for corner clearance.

8.2 Sight Distance Analysis

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, and
- 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 * tag*

Where;
ISD = Intersection Sight Distance
V major = design speed of roadway (km/h)
tg = assumed time gap for vehicles to turn from stop onto roadway (s)

Table 10 below summarizes the required and available sight lines at the proposed site access to Prospect Street. **Figure 8** illustrates the sight lines at the site.

Table 10: Sight Distance Analysis

Feature	Site Access at Prospect Street
Access Type	Full-Movement
Posted Speed Limit of Roadway	40 km/h
Assumed Design Speed	50 km/h
Base Time Gap [1]	6.5 s (right) 7.5 s (left)
Grade of Roadway	Less than 3%
Horizontal Alignment of Roadway	Straight
Required Sight Distance (right-turn) [2] to intersection	95 m
Available Sight Distance (right-turn) to intersection	>95 m
Required Sight Distance (left-turn) [2]	105 m
Available Sight Distance (left-turn)	>105 m
Minimum Sight Distances Satisfied?	Yes

Note 1: Time gap for left-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.

Sufficient sightlines are available at the proposed site access. It is noted that the approaching vehicles from the intersection of Brant Street and Prospect Street/Grahams Ln are visible from the proposed site access and support the right-turn movements on to the prospect street.

Therefore, the proposed site access is supportable from a sight distance perspective.



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SIGHT DISTANCE ANALYSIS

CROZIER
CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON. L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By: A.D.	Design By:	Project:	2321-6440
Check By: B.B.	Check By:	Scale: 1:400	Drawing: FIG 08

8.3 Site Circulation Assessment

A site circulation assessment has been conducted to ensure the proposed site design provides adequate space for maneuvering of emergency, loading, waste and passenger vehicle movements. The maneuvers are discussed in further detail below.

8.3.1 Emergency Vehicle

A maneuvering assessment was conducted for emergency vehicles using a Halton Pumper Fire Truck 12.19 metres wide. As shown **in Figure 9,** fire trucks would arrive at the site by lay-bying on Prospect Street and entering the building via entrance located on the northeast corner.

It is noted that as the building entrance is within 15 meters of the existing collector roadway on Prospect Street, therefore, emergency vehicles would not be required to circulate the site and are expected to instead lay-by on Prospect Street.

8.3.2 Waste Vehicle

A maneuvering assessment was conducted for waste vehicles using Halton Region front loading garbage truck. The truck can enter and exit the site without any encroachments on curb. No conflicting movement is observed for the truck while pulling in and reversing out of the loading space as shown i**n Figure 10.**

8.3.3 Loading Vehicle

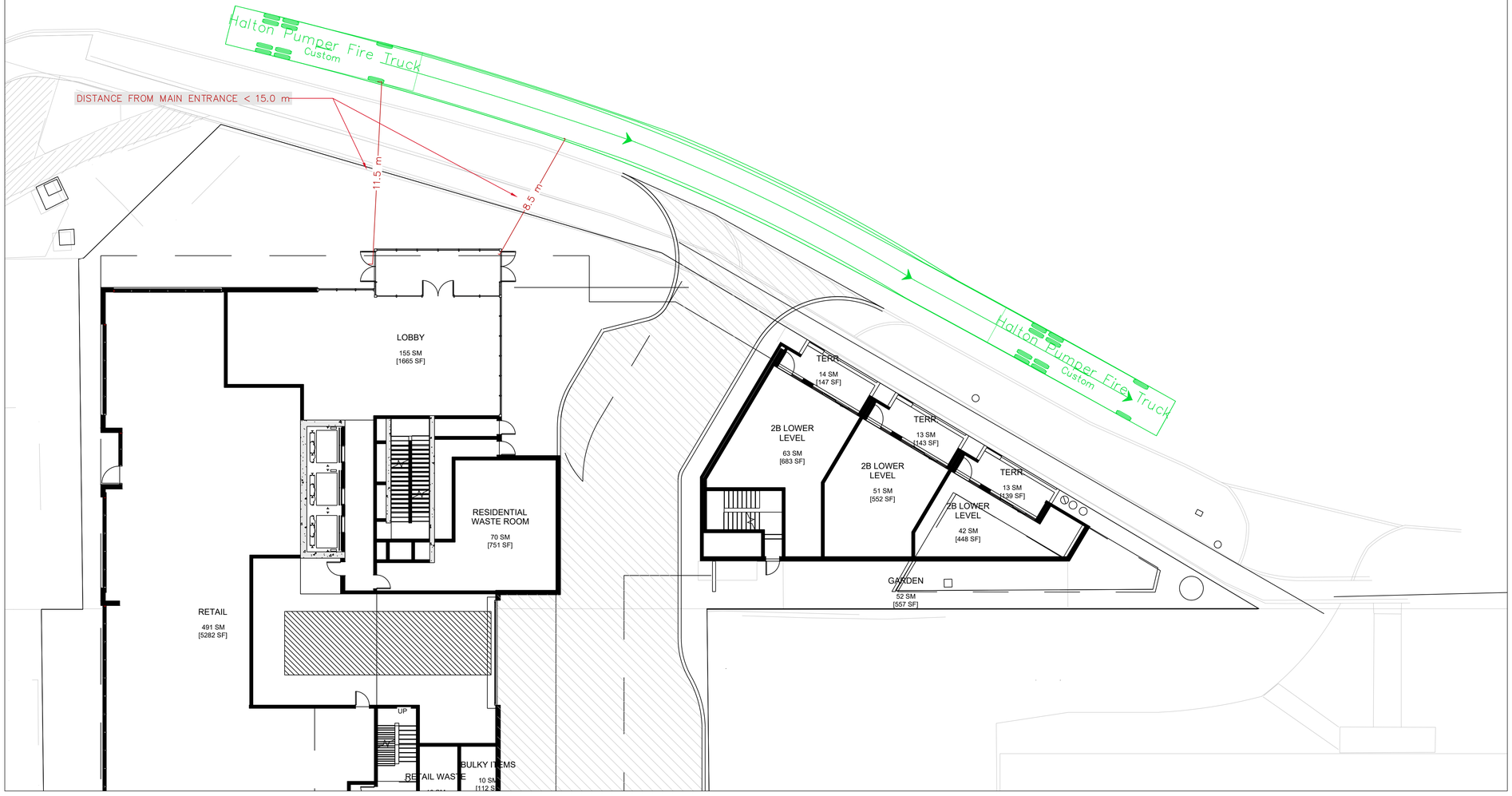
A maneuvering assessment was conducted using Medium Single Unit (MSU) vehicle accessing the loading space. The MSU can access the site via the Prospect Street, reverse into the loading space, and exit the loading space and site without encroaching on curbs or obstacles as shown **in Figure 11.**

8.3.4 Passenger Vehicle

A maneuvering assessment was conducted for passenger vehicle using a TAC passenger vehicle (PTAC) and no encroachments were observed while entering and exiting the site access, as well as entering and exiting the ramp to the underground parking as shown in **Figure 12.** However, a convex mirror should be placed at the top of the underground ramp to extend driver sightlines since two PTACs entering and exiting the ramp simultaneously would need to encroach on each other's swept path.

Figure 13 shows a typical passenger car (~5.00 metres in length) using the pick-up and drop-off area, as well as the turnaround area opposite the loading area with no curb encroachments. It is also noted that a larger PTAC vehicle would be required to make a three-point turn in the turnaround area.

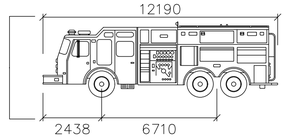
Additionally, the underground parking garage was tested using a PTAC vehicle and the vehicle can maneuver throughout the garage, as well as in to and out of the second to last dead-end space at the northeast corner of the garage as shown in **Figure 14.** However, the last dead-end space in the northeast corner cannot accommodate a PTAC vehicle. It is therefore proposed to be a small car space, since it can be accessed by a small car (Mini-Cooper), as shown in **Figure 15.**



N



VEHICLE PROFILE



Halton Pumper Fire Truck

	mm
Width	: 2490
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

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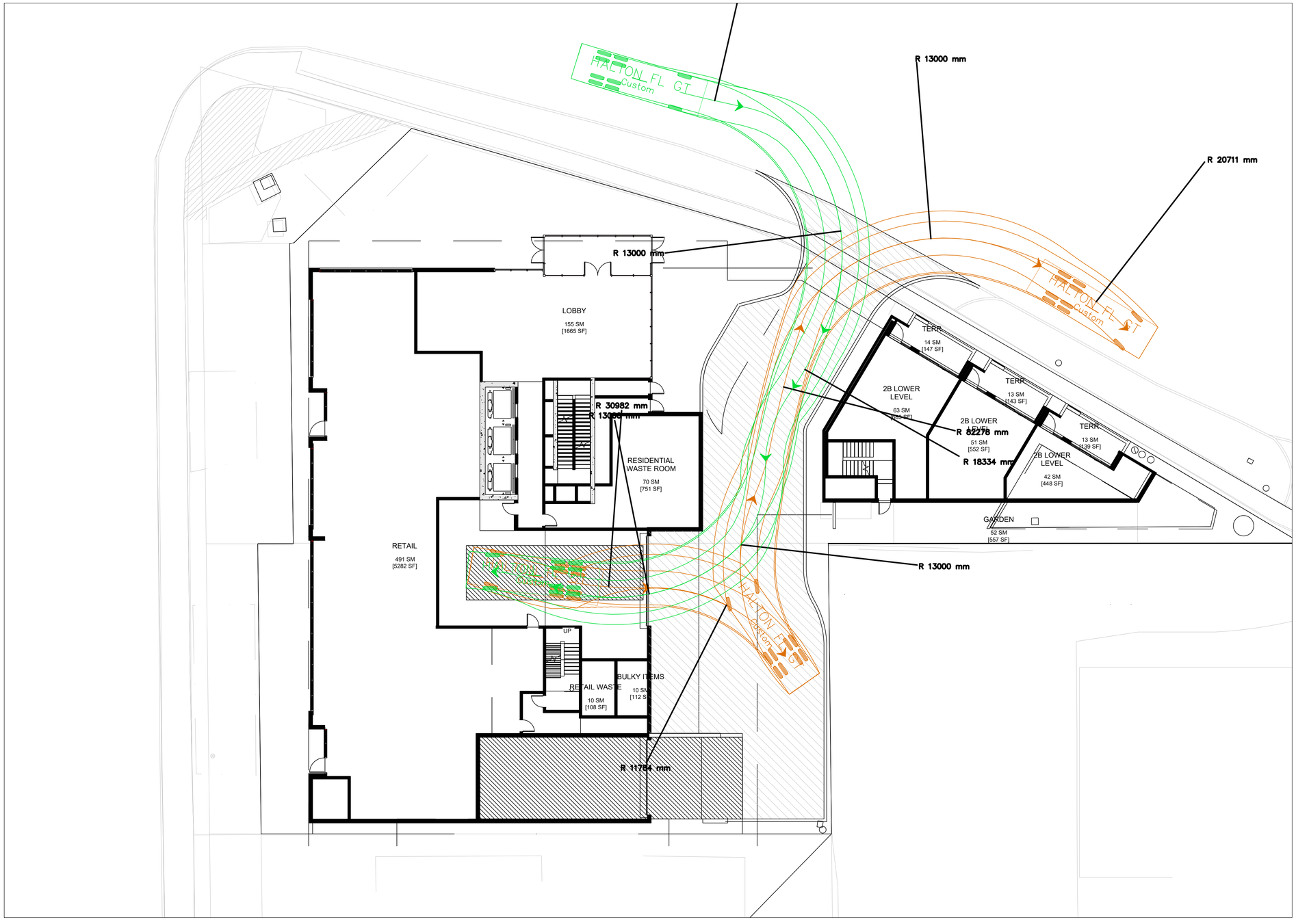
795 BRANT STREET
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
FIRE TRUCK

CROZIER
CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON, L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

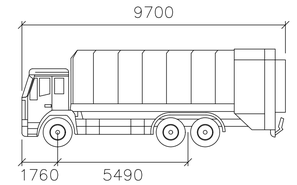
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A.D.			2321-6440
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B.B.		1:150	FIG 09



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VEHICLE PROFILE



HALTON FL GT

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Track	: 2700
Lock to Lock Time	: 6.0
Steering Angle	: 35.3

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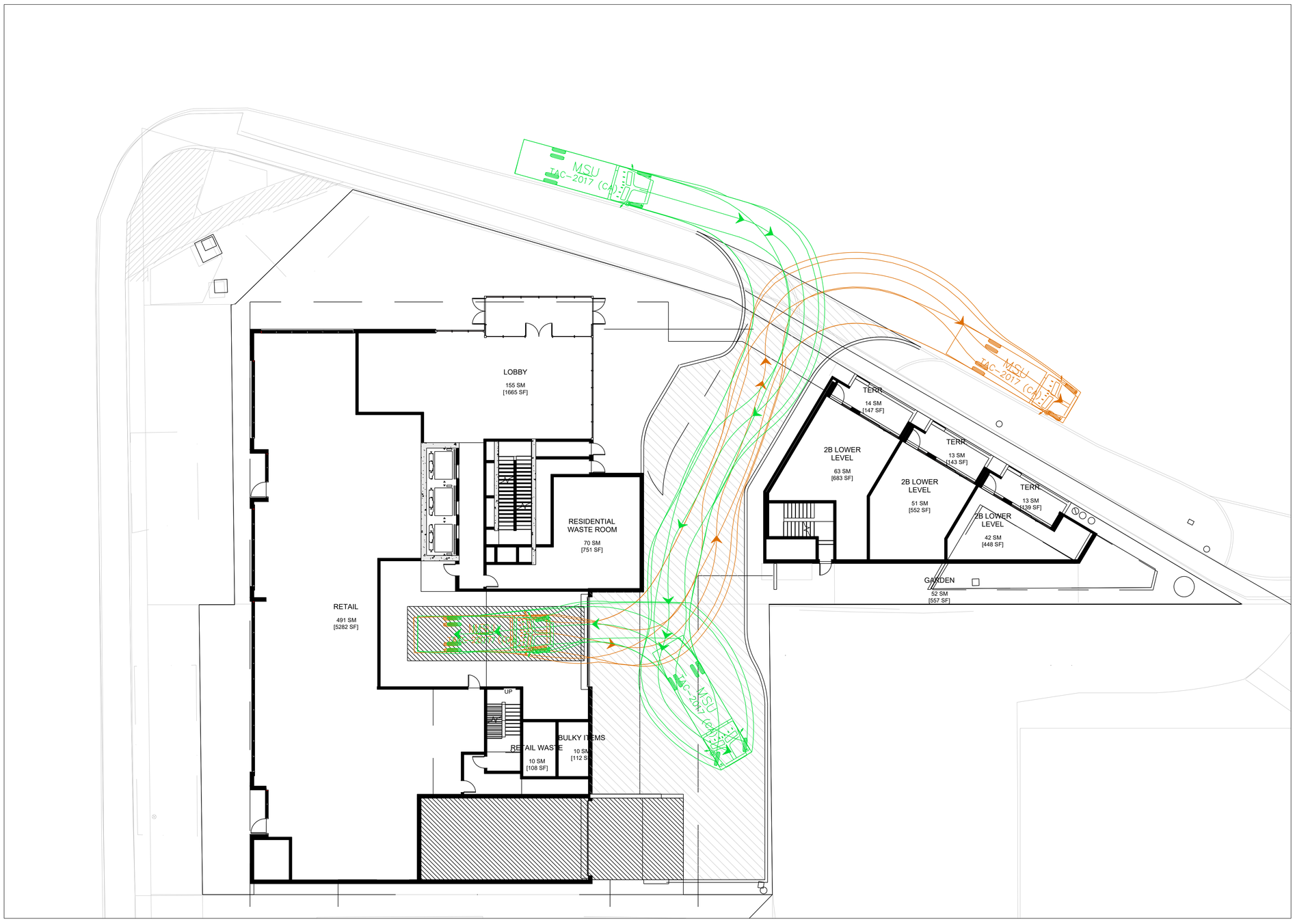
795 BRANT STREET
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
WASTE VEHICLE

CROZIER
CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON, L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

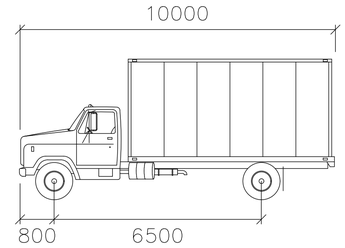
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A.D.			2321-6440
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B.B.		1:150	FIG 10



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VEHICLE PROFILE



MSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

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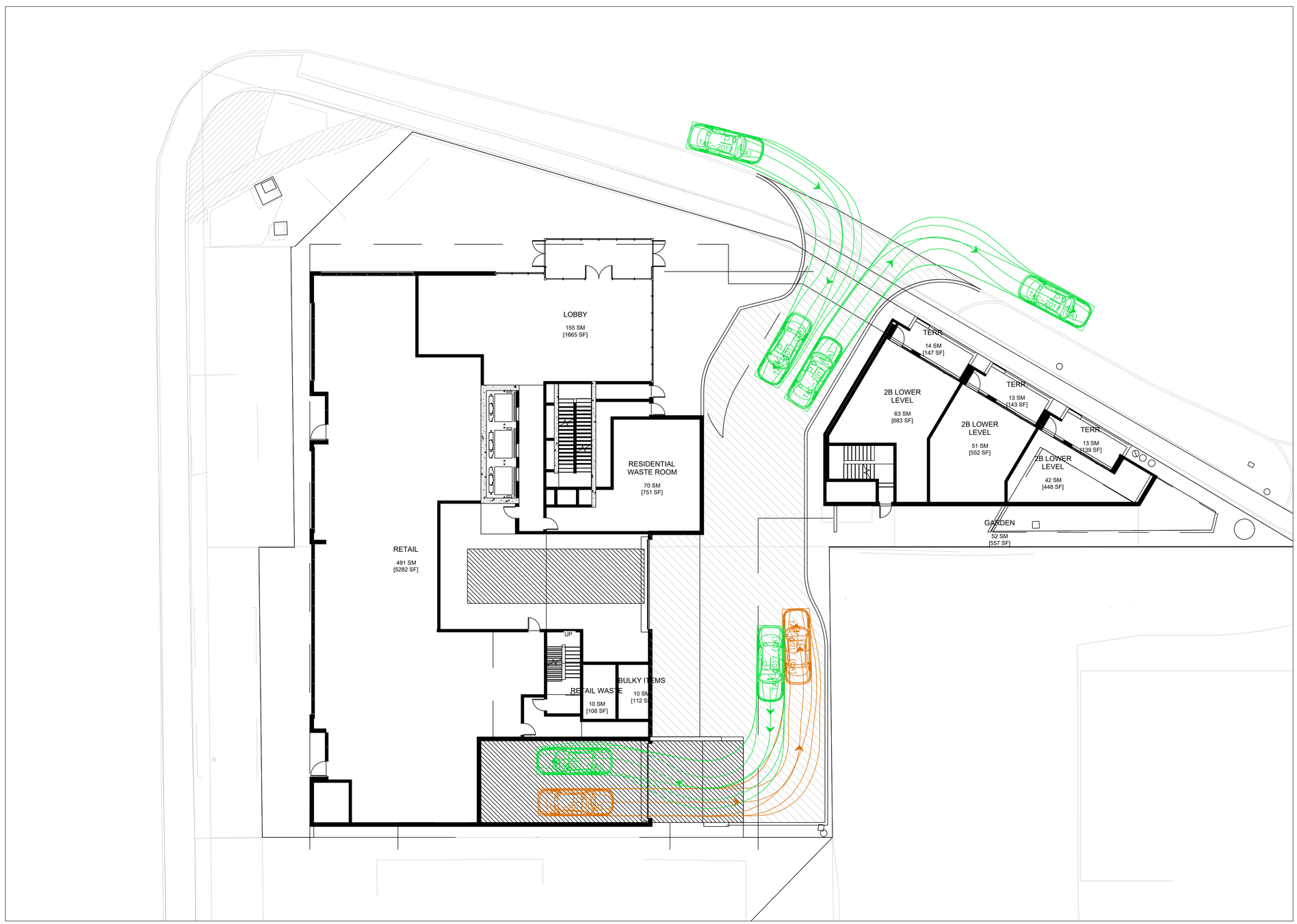
795 BRANT STREET
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
LOADING VEHICLE (MSU)

CROZIER
CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON. L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

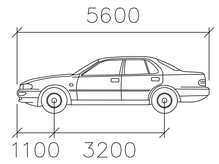
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A.D.			2321-6440
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B.B.		1:150	FIG 11



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VEHICLE PROFILE



P

	mm
Width	: 2000
Track	: 2000
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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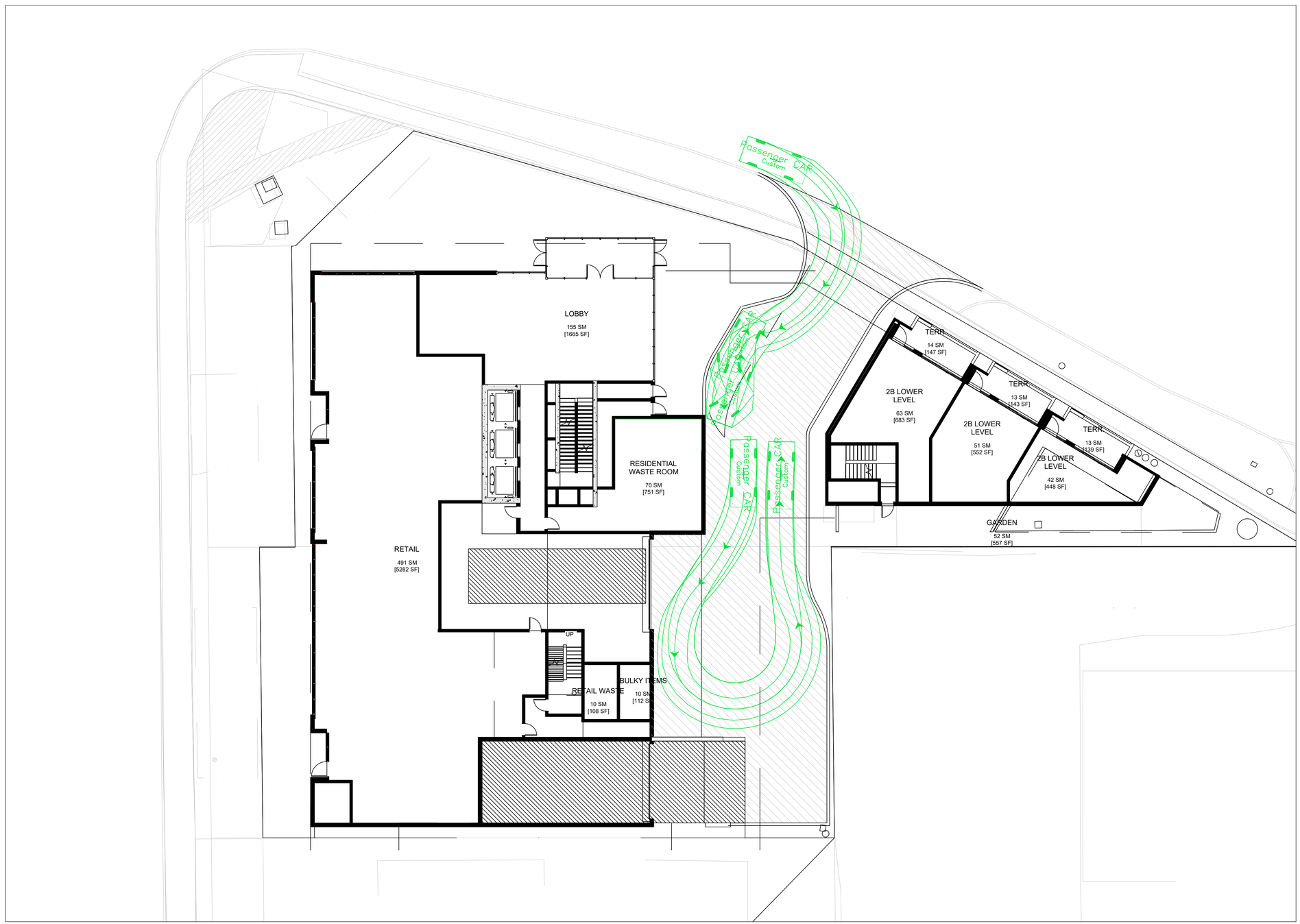
795 BRANT STREET
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
PTAC VEHICLE

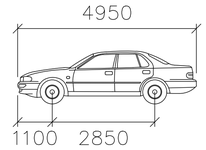
CROZIER
CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON, L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	Design By	Project	
A.D.			2321-6440
Check By	Check By	Scale	Drawing
B.B.		1:150	FIG 12





VEHICLE PROFILE



Passenger CAR

	mm
Width	: 1930
Track	: 1930
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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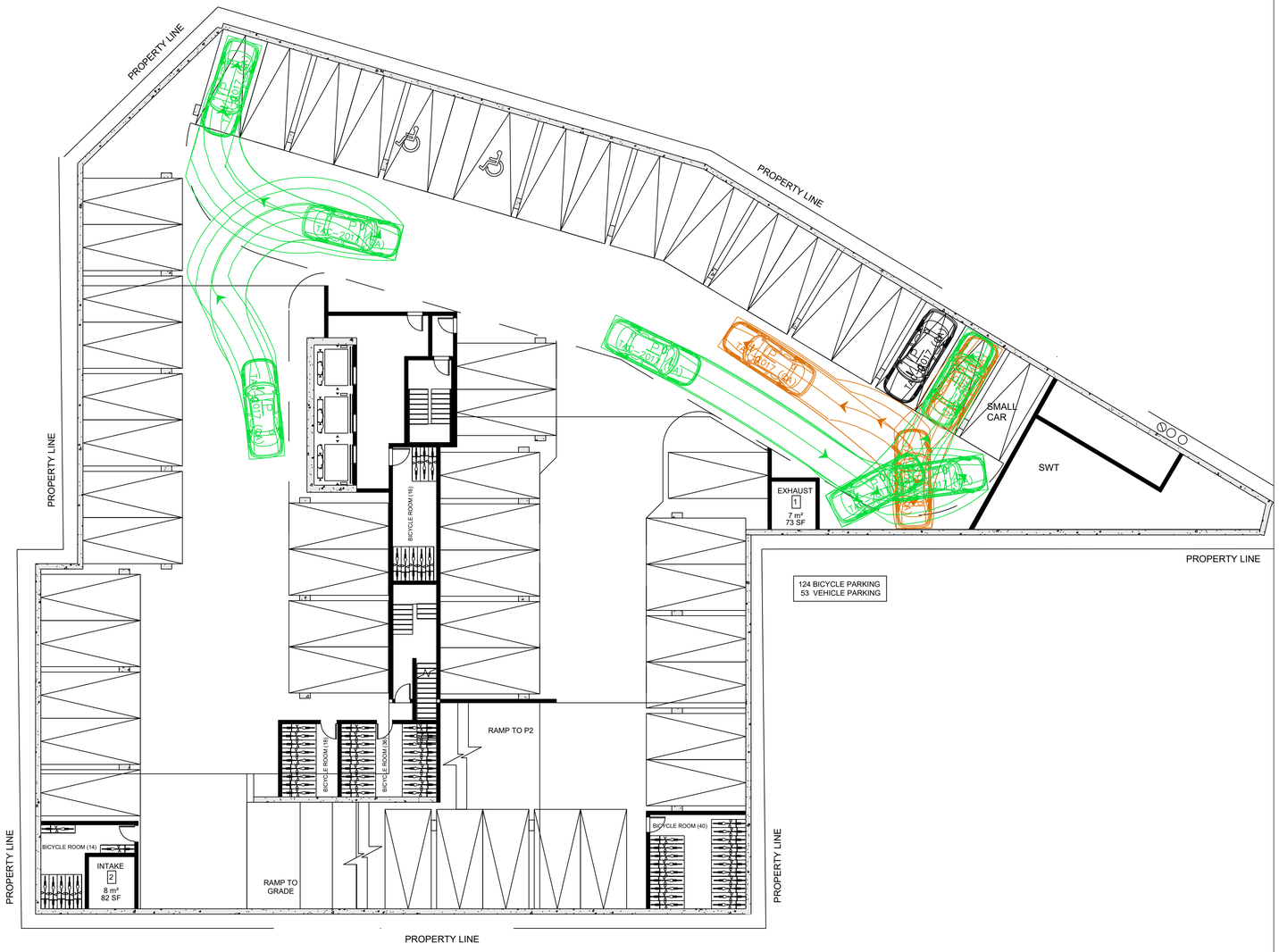
795 BRANT STREET
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
PASSENGER CAR PICK-UP, DROP OFF AND TURN AROUND

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CONSULTING ENGINEERS
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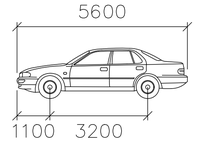
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A.D.			2321-6440
Check By	Check By	Scale	Drawing
B.B.		1:150	FIG 13



N



VEHICLE PROFILE



P

	mm
Width	: 2000
Track	: 2000
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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Project

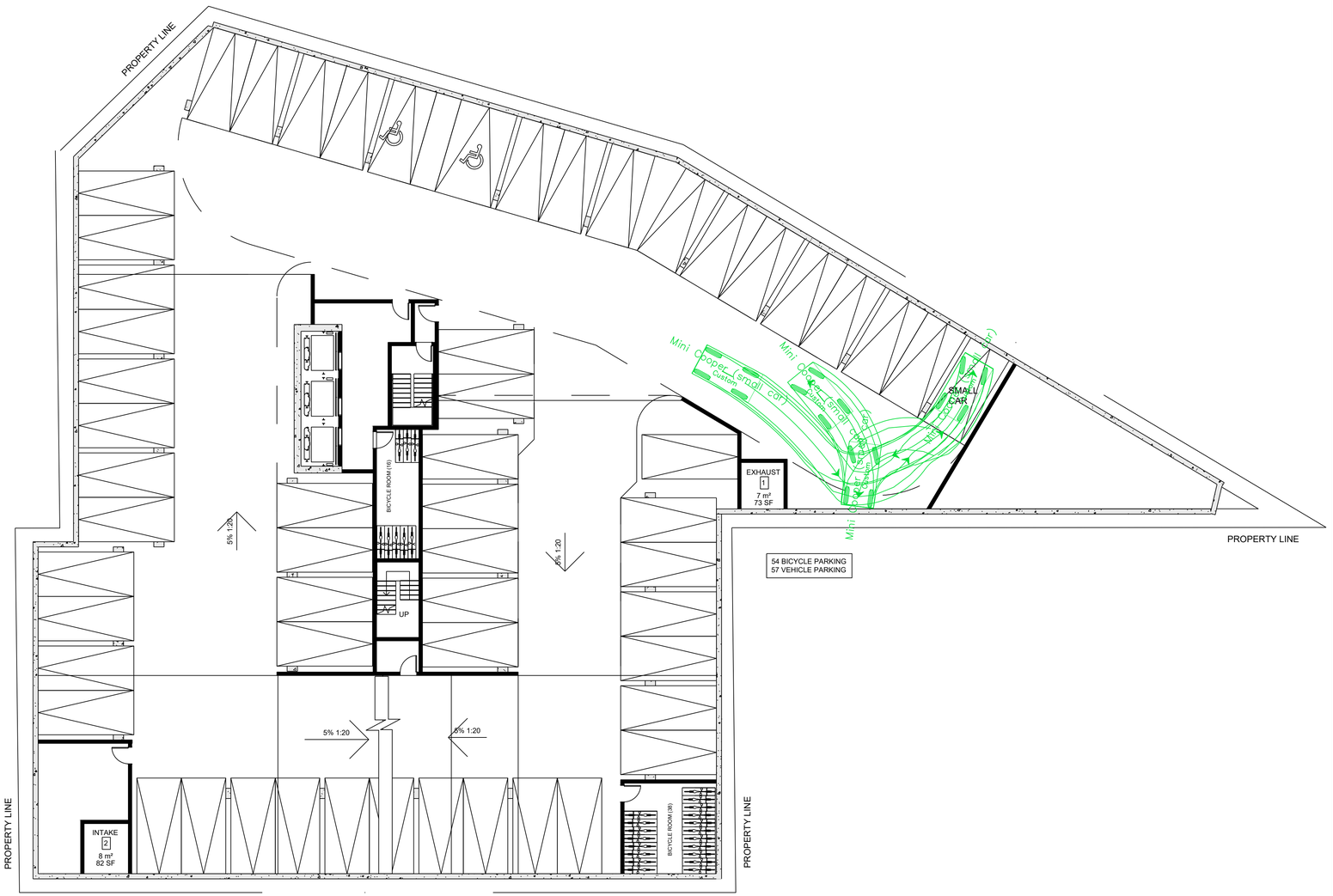
795 BRANT STREET
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
PTAC CRITICAL PARKING

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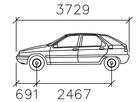
Drawn By	Design By	Project	
A.D.			2321-6440
Check By	Check By	Scale	Drawing
B.B.		1:150	FIG 14



N



VEHICLE PROFILE



Mini Cooper (small car)

	mm
Width	: 1892
Track	: 1683
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

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795 BRANT STREET
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
SMALL CAR CRITICAL PARKING SPACE

CROZIER
CONSULTING ENGINEERS
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SUITE 100
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Drawn By	Design By	Project	
A.D.			2321-6440
Check By	Check By	Scale	Drawing
B.B.		1:150	FIG 15

9.0 Parking Review

The section discusses the parking requirements per the City of Burlington Zoning By-Laws and compares the requirements to the proposed parking supply for bicycles and vehicles at the site. The proposed vehicle parking supply does not meet the City's By-Law requirements; therefore, a parking justification has been completed to support the proposed vehicle parking supply at the subject site.

9.1 City of Burlington Zoning By-Law Parking Requirements

This sub-section discusses the Zoning By-law requirements for both vehicles and bicycles according to the current City of Burlington By-law.

9.1.1 Vehicle Parking Requirements

The existing City of Burlington Zoning By-Law Parking Requirements have been reviewed for the land uses proposed at the subject site.

It is noted that the development site lies within the Primary Growth Area as identified on schedule B-1 of the City Official Plan (2020). The current parking rate is an interim rate and is subject to further study to be undertaken by the City.

Therefore, "in-effect" apartment parking rates were used to calculate the required parking for the proposed development, as shown in with the results for each rate shown in **Table 11.**

Table 11: Existing Parking Requirements

Land Use	Type of Unit	Number of Units/ GFA m^2	Parking Requirements	Parking Required	Parking Provided
Residential	Dwelling Units	356	1.25 spaces per unit (Residential and Visitor)	**445 spaces**	**226 Spaces (Resident) & 53 spaces (Shared Retail and Visitor)**
Retail	Gross Floor Area	485	3.5 spaces per 100 m^2 gross floor area	**17 spaces**	
Total				**462**	**279 (-183)**

As outlined in **Table 11**, the proposed development provides a deficiency of 183 parking spaces per the current existing parking requirements.

The subject site falls within the existing Burlington GO Transit Station MTSA, and as such, the parking demand for vehicles would be expected to be significantly lower due to proximity to the Burlington GO Station. Furthermore, the City has acknowledged that the By-law rates are "interim" rates and are generally significantly higher than parking demand within transit-oriented communities such as the Burlington and Aldershot MTSA.

Relevant Zoning By-Law Excerpts are attached in **Appendix J.**

9.1.2 Bicycle Parking Requirements

The most recent Site Plan provides a total of 178 long-term and 18 short-term bicycle parking spaces.

Per the updated City Zoning By-Law 2020, the required bicycle parking spaces are summarized in **Table 12.**

Table 12: Bicycle Parking Requirements

Type of Space	Land Use	# of Units/GFA	Number of Spaces Required	Spaces Required	Spaces Provided
Residential	Long Term	356	0.5 Long-Term bicycle parking spaces per unit	178	178
	Short Term	356	0.05 Short-Term bicycle parking spaces per unit	18	18
	Total			196	196

Per the requirements summarized in **Table 12,** the number of long-term and short-term bicycle parking spaces per the most recent Site Plan meets the City By-Law standards.

Relevant Zoning By-Law Excerpts are attached in **Appendix J**

9.2 Vehicle Parking Justification

To forecast the parking demand for the proposed mixed-use development, parking rates for sites with similar land use characteristics within the City of Burlington were examined along with industry standard data from the ITE Parking Generation Manual.

9.2.1 Policies and Surrounding Area

The subject site falls under the Primary Growth Area as per Schedule B-1 Growth Framework, City of Burlington and is within walking distance of Burlington GO Transit Station. The site is subject to Major Transit Station Area (MTSA) due to the proximity to the GO transit station and will be expected to have reduced auto parking demands given that the Brant Street south of Fairview Street is also a Primary Mobility Hub Connector and Frequent Transit Corridor.

In consideration that a large portion of residents and visitors at the site would be able to rely on transit for most trips as opposed to driving, the reduced parking at the site would prevent an oversupply of parking and support a compact built form within the MTSA.

9.2.2 ITE Parking Demand

The Institute of Transportation Engineers (ITE) Parking Generation Manual 5th Edition contains parking demand data from surveys for a variety of sites across Canada and the United States and is well recognized in the industry for parking demand data in lieu of, or in combination with data collected from local sites.

Land Use Code 222 "Multifamily Housing (High-Rise)" for sites not located near rail transit and for sites located in 0.5 mile of rail transit was used to estimate the site's peak parking generation, as tabulated in **Table 13.**

Table 13: ITE Parking Demand

Land Use Code	Location	Number of Units/ GFA	Parking Requirements	Parking Required	Parking Provided
Multifamily housing (High-Rise) (LUC 222)	Not close to rail transit	356 Dwelling Units	0.98 spaces per unit	349 spaces	279 Spaces **(-70)**
	Close to rail transit		0.44 spaces per unit	157 spaces	279 Spaces **(+122)**

As outlined above, the proposed parking supply would be deficient by 70 spaces to accommodate the expected parking demand at the site based on the ITE parking demand forecasted for sites not close to rail transit.

However, the site is located within 800 metres of Major Transit Station Area (MTSA) Burlington GO Station and thus the ITE parking demand was also forecasted for sites close to rail transit since this rate would be expected to better reflect the future parking demand at the site. The provided parking supply meets the required parking supply and is therefore expected to accommodate the parking demand when considering the close to rail transit ITE rate.

9.2.3 Recently Approved Development Parking Rate at 53-71 Plains Road East

The site at 53-71 Plains Road East and 1025 Cooke Boulevard proposes the construction of a 10 and 12-storey building with 450 residential units and 1209 m^2 of ground-floor retail space.

The development proposed a parking rate of 0.78 parking spaces per unit for residential spaces, which was ultimately approved per the Ontario Land Tribunal (OLT) settlement dated June 28, 2022.

Due to this development's similarity in size, scale, and location compared to the subject site, it provides a useful comparison and precedent regarding what would be an appropriate parking supply within the Burlington GO MTSA similar to the Aldershot GO MTSA and supports the proposed combined parking rate of 0.78 parking spaces per unit.

9.2.4 Parking Demand Summary

The section provides a summary of parking supply per the City of Burlington and ITE parking rate alongside the recently approved parking rate in the City.

Table 14: Combined Resident and Visitor Parking Rate

Parking Demand	Source	Parking Rate
City of Burlington	Zoning By Law	1.25 spaces per unit (incl. visitor)
53-71 Plains Road East & 1025 Cooke Boulevard	OLT Settlement	0.78 spaces per unit (Approved)
ITE Parking Demand Multifamily High-rise (Land Use 222)	ITE Parking Manual 5	0.98 spaces per unit (not close to rail transit)
		0.44 spaces per unit (close to rail transit)
Proposed Development		**0.78 spaces per unit**

In synopsis, the propose parking supply of 0.78 spaces per unit is expected to suffice the parking demand at the proposed development. The City of Burlington parking rates are interim rates and are subjected to change in near future.

Further, the recent approval of 0.78 spaces per unit for the development located at 53-71 Plains Road East provides a fair justification of reduced parking rate being close to the GO Station. The subject site is also located in proximity of the Burlington GO station and comes under the Major Transit Station Area (MTSA) with well-connected transit routes to and from the station which will promote the use of transit service and further support the application of the reduced parking demand.

9.3 Parking Space Dimensional Requirements

It is noted that the site is also proposing parking space sizes below the existing City of Burlington By-law requirements. The proposed dimensions and the City's By-law requirements are summarized in **Table 15** below, along with dimensional requirements from other municipalities for comparison and benchmarking. It is noted that Burlington currently has the largest parking space requirements of the municipalities reviewed.

Table 15: Parking Space Dimension Review

Municipality	Width (m)	Length (m)
Burlington	2.75	6.0
Toronto	2.6	5.6
Hamilton	2.6	5.5
Oakville	2.6	5.2
Mississauga	2.6	5.2

It is noted that the width shown above is for spaces within parking garages for municipalities that make a distinction.

While the proposed dimensions of the parking spaces do not meet the dimensional requirements within the existing City By-law, they do meet the existing City of Toronto, City of Hamilton, Town of Oakville and City of Mississauga standard, which ensures that the spaces would function adequately.

Furthermore, the reduction is considered appropriate given that the City of Burlington currently has the largest dimension requirements for parking spaces and given the expected urbanization of the surrounding land-uses within the Major Transit Station Area (MTSA). The reduction of the parking stall sizes should be encouraged within this MTSA since it allows for a more efficient design of the parking garage that encourages a more compact development form.

Therefore, the reduced size of the spaces can be supported given that the spaces are still expected to function adequately for vehicles parking at the site, and that the area is planned for significant intensification.

10.0 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.

10.1 Existing TDM Identification

10.1.1 Modal Split

Transportation Tomorrow Survey (TTS) data was filtered for households situated in 2006 GTA Zones for households situated in 2006 GTA Zones 4057, 4058, 4059, 4060 and 4062 to determine the modal splits for trips expected at the subject site.

Table 16: Modal Split

Mode of Travel	Modal Split
Transit	6%
Walking	3%
Cycling	2%
Auto	89%

As summarized above, the TTS data for the site suggests that transit, walking or cycling have not historically been popular modes of transportation. Additionally, it is expected that promoting TDM measures at the site will encourage residents and visitors to use the ample transit opportunities available near the site.

10.2 Existing Public Transit

As discussed previously in Section 4.3 Existing Transit, there are several transit facilities available within walking distance of the subject site. Most notably, close proximity of the subject site to the Burlington GO station provides connections across Southern Ontario using GO service, and local trips are serviced by various Burlington Transit Routes.

10.3 TDM Initiatives and Recommendations

10.3.1 Sidewalk Connectivity

The proposed site plan includes pedestrian connections from the development to the existing sidewalks on Prospect Street. The boulevard sidewalks are present along the north and south of Prospect Street providing a great connectivity to sidewalks on Brant Street. The direct connection provides easy access to pedestrians with existing transit stops at the intersection of Brant Street and Prospect Street, as well as numerous institutional, commercial and recreational facilities on Brant Street in the proximity of the site.

10.3.2 Cyclist Facilities

A dedicate bicycle lane is provide on the north side of the prospect street with sharrow marking on the south side to support bicycle movements. The brant street also consists of distinguished bicycle lanes on east and west side providing a good bicycle connectivity to Burlington GO Station via Fairview Street.

10.3.3 Carshare Facilities

The developer is recommended to consult with carshare providers to provide vehicle(s) and dedicated parking stall(s) on-site to discourage car ownership and promote residents to use a variety of modes of travel, using the shared vehicles when necessary. The residents will be encouraged to use cycle or walk for short duration trips and use carshare for essential purpose only.

10.3.4 Unbundled Resident Parking

The developer will be recommended to provide separate (or unbundled) resident parking to separate the cost of parking from the cost of each residential unit for all new residents on site. This will make visible the hidden cost of driving and encourage residents to make more effective use of active transportation and available transit facilities.

10.3.5 Free/ Subsidized Transit Passes

The developer will be suggested to provide subsidized transit passes as a new move-in incentive for certain time period to encourage the habit of using public transit and discourage the use of automotives.

10.3.6 Wayfinding and Travel Planning

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 train or bus routes. Additionally, brochures outlining nearby transit nodes, bicycle routes, and pedestrian routes should be made available at the lobby.

10.3.7 Education/Promotion

To promote the use of alternative modes of transportation various educational measures and incentives may be promoted at the new residential site.

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 the Burlington GO station and nearby bus stops, as well as the accessibility to bike storage, carshare spaces, and an accessible cyclist network.

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. A further step would be to include transit (PRESTO) passes to new residents as part of a welcome package to further incentivize use of transit.

10.3.8 Parking

Through parking related TDM measures, the objective is to reduce the frequency of single occupant auto trips taken to and from the site.

The most recent Site Plan provides a deficiency of parking spaces below the By-law required rates. This reduces the number of vehicles owned by each household and encourage the use of other modes of transportation to visit the proposed site. Given the site's proximity to transit, the reduced parking rate is encouraged since visitors and residents have convenient access to the GO train network and local transit.

A reduction in number of vehicle parking spaces can be negotiated in exchange for additional bicycle parking spaces.

Additionally, parking may be unbundled with the purchase of a residential unit so that future residents have a clearer picture of the costs of automobile ownership

11.0 Conclusion

This study has analyzed potential traffic impacts on the boundary road network in relation to the development at 784 and 795 Brant Street. The detailed analyses contained within this report may be summarized with the following key findings:

- Under 2022 existing conditions, the intersection of Brant Street and Fairview Street operates with a Level of Service (LOS) "D" or better during the weekday A.M. and P.M. peak hours. At this intersection, the eastbound through movements operate near capacity and eastbound left turn lane exceed the available storage during A.M. peak hour. The eastbound left-turn and northbound through movements operate near capacity and the eastbound and northbound left-turn lanes exceed the available storage during P.M. peak hour. However, the westbound through movements operate above capacity during P.M. peak hour.

  The westbound through operating above capacity is majorly due to the mismatched signal timing plan. As a result, a lost time adjustment of -4.0 seconds was applied to the westbound through movement to better reflect existing operations.

  All other intersections currently operate with minimal delays during the morning and afternoon peak hour.

- Under 2027 future background conditions, the intersection of Brant Street and Fairview Street is anticipated to operate with LOS "D" or better similar to the 2022 existing conditions, with an additional critical capacity expected for the southbound through movement and 95th percentile queue length expecting to increase by 35 metres for the northbound left-turn lane during the P.M. peak hour

  The intersection of Brant Street and Fairview Street also forecasts the 95th percentile queue length for eastbound left-turn and westbound left-turn to exceed the available storage during the P.M. peak hour.

  All other intersections are forecasted to operate with minimal delays during the morning and afternoon peak hour.

- The proposed development is expected to generate 97 two-way (33 inbound and 64 outbound) trips during the weekday A.M. peak hour, and 115 (64 inbound and 51 outbound) trips during the weekday P.M. peak hour.

- Under 2027 future total conditions, the intersection of Brant Street and Fairview Street is anticipated to operate with LOS "E" or better with an addition of overcapacity movements expected for the northbound left turn during afternoon the P.M. peak hour. Further, the southbound left-turn lane and westbound left-turn lane are expected to exceed the available storage during A.M. and P.M. peak hours, respectively.

  Further, the intersection of Brant Street and Prospect Street Grahams lane is forecasted to have a minor 5.0 metres increase in the 95th percentile queue length for eastbound and westbound left turn lane during the P.M. peak hour compared to the 2027 future background conditions.

  The remaining intersections are intended to operate with minimal delays and no queue length issues.

- The proposed site access at the Prospect Street is expected to operate with a Level of Service "B" or better during the morning and afternoon peak hour.

- The following improvements are recommended as mitigation measure at critically operating intersections:

    - The intersection of Brant Street and Fairview Street was analyzed with an addition of northbound left turn and southbound left turn lane which showed a significant decrease in the westbound through movements improving overcapacity movements and decreasing the 95th percentile queue length for northbound left-turn lane by 60 metres during the P.M. peak hour. However, the remaining movements are still expected to be critical during the P.M. peak hour, the improvement is only expected to provide a marginal difference at a significant cost to the city.

    - Additionally, the overcapacity movements are also expected to be an outcome of the mismatched signal timing plans and traffic data collection and the capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic. Thus, optimizing the signal timings to provide additional green time and adjust signal timings is recommended to mitigate delay and capacity.

    - For the intersection of the Brant Street and Prospect Street/ Grahams Lane to accommodate the 95th percentile queue length, an additional 15 metres of storage for eastbound left turn and 25 metres of storage for westbound left turn is needed to suffice the traffic volumes. The lane is required to be repainted between Brant Street at Prospect Street and Robinson Street to provide a 45 metres eastbound left-turn lane.

- The sightlines at the proposed accesses on Prospect Street were verified using the guidance provided by the Transportation Association of Canada (TAC), and sufficient visibility of oncoming vehicles are provided for vehicle. Additionally, corner clearance and access spacing to adjacent driveways were verified at each access and are expected to be sufficient.

- Vehicle maneuvering analysis was undertaken for the site using expected design vehicles (fire, waste, medium-single unit truck and passenger vehicles). It is noted that the larger vehicles would not expect to have any encroachments, however passenger vehicles in certain underground spaces may face some difficulties maneuvering. As such, the critical parking spaces are labelled as small car spaces and will be used by small cars.

- The proposed vehicle parking supply at the site is deficient by 183 spaces per the City's By-Law requirements but can be supported based on the prepared Parking Justification, which included a review of ITE parking rates as well as the approved parking rate in the city.

- The proposed long-term and short-term bicycle parking supply at the site is sufficient per the City's By-Law requirements.

The proposed development at 789 and 795 Brant Street is not anticipated to materially impact operations within the boundary road network. As sightlines are adequate and site circulation by design vehicles is feasible, the Official Plan Amendment, Zoning By-Law Amendment and Plan of Subdivision applications for the site situated at 789 and 795 Brant can be supported from a traffic operations and safety perspective.

We trust the assessment contained herein satisfies any transportation related concerns associated with the proposed development. Please do not hesitate to contact the undersigned to request further information.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

Aarzoo Dhanani, M. Eng, EIT
Engineering Intern, Transportation

C.F. CROZIER & ASSOCIATES INC.

Brandon Bradt, M. Eng. CEM, P. Eng
Project Manager, Transportation

AD/BB

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LICENSED PROFESSIONAL ENGINEER
B. A. BRADT
100501973
PROVINCE OF ONTARIO

Digitally signed by Brandon Bradt
Date: 2022.11.01 10:19:48-04'00'

APPENDIX A

City and Region Correspondence

Aarzoo Dhanani

From: Huycke, Adam <Adam.Huycke@halton.ca>
Sent: Monday, July 4, 2022 3:07 PM
To: Aarzoo Dhanani; Dan Ozimkovic
Cc: Brandon Bradt; Walter Scattolon; Arnott, Kayleigh; Liang, Ivy; Kaur, Navjot - LPS
Subject: RE: Terms of Reference- 795 Brant Street (CFC# 2321-6440)

Hello Aarzoo,

Thank you for circulating the Terms of Reference for the proposed TIS for the development at 795 Brant Street.

The Region's interest in this development from a TIS perspective is to ensure impacts to the Regional Intersection at Brant Street/Fairview Street are assessed. The portion of Brant Street south of Fairview Street/Brant Street intersection is considered a Local road complete to Lakeshore Road, and falls under City of Burlington's responsibility.

- The Region approves of the inclusion of the signalized intersection of Fairview Street at Brant Street (Regional Road 18) in the Study Area Intersections.
- The Region approves of the proposed use of the 2019 traffic counts conducted as part of the Paradigm TIS for use within the TIS for the Regional Intersection (Fairview Street at Brant Street).
- The Region approves of the proposal that a background growth rate of 1% compounded annually is to be applied to the traffic volumes for through traffic movements along Brant Street and Fairview Street.
- Please obtain any available traffic data / signal timing plans via request to trafficdatarequests@halton.ca for Regional roads/intersections.
- Please consult the Region's TIS Guideline for report requirements here: https://www.halton.ca/Repository/Transportation-Impact-Study-Guidelines

The City of Burlington staff can provide additional relevant background developments, as well as the associated traffic impact studies, and may have more comments for you, and we trust those will be adhered to in the TIS report and analysis.

We look forward to the TIS circulation.

Thank you,

Adam

Adam Huycke, MCIP, RPP, CPT
Senior Planner
Planning Services
Legislative & Planning Services
Halton Region
905-825-6000, ext. 7604 | 1-866-442-5866



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From: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Sent: Tuesday, June 21, 2022 4:44 PM
To: Dan Ozimkovic <danijel.ozimkovic@burlington.ca>; Huycke, Adam <Adam.Huycke@halton.ca>
Cc: Brandon Bradt <bbradt@cfcrozier.ca>
Subject: RE: Terms of Reference- 795 Brant Street (CFC# 2321-6440)

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Hello,

C.F. Crozier and Consulting Engineers (Crozier) has been retained to provide Transportation Engineering services a for a Mixed-Use development comprising of ground-level retail and residential units for the property located at 789-795 Brant Street in the City of Burlington, Halton Region. The latest Site Plan for the proposed development is attached to this email to aid in your review.

To support our Transportation Impact Study and Parking Justification Study, 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.

Background

According to the site plan prepared by RAW, dated June 2022, the development is envisioned to consist of the following elements:

- An approximately thirty one (31) storey mixed use development with ground floor retail plus mechanical penthouse and 7 storey podium
- A total of approximately 310 residential units
- A 5 level underground parking with a total of approximately 275 vehicle parking spaces and 118 bicycle parking spaces
- One full-moves site access via Prospect Street

Any minor changes to the development concept are not expected to affect the Terms of Reference.

Study Methodology for the Transportation Impact Study

The following intersections are proposed to be analyzed as part of the scope of study:

- Brant Street and Prospect Street/Grahams Ln (Signalized)
- Prospect Street and Robinson Street/Private Access
- Brant Street and Ghent Avenue (Signalized)

- Fairview Street and Brant Street (Signalized)
- Proposed site access via Prospect Street

We kindly request recent traffic counts and signal timing plans available to the City of Burlington at the above noted intersections and confirmation that the above noted intersections are sufficient for analysis.

It is noted that Paradigm Transportation Solutions Limited (Paradigm) conducted traffic counts for most of the above intersections from the year 2019, which Crozier proposes to use to perform the analysis for the TIS. For the remaining intersection at Prospect and Robinson, we would collect new counts from specialty traffic counting firms we typically work with.

Please advise whether the 2019 counts would be acceptable for use in the study. Further, if the collection of new counts is not be acceptable please advise on further steps necessary to proceed with data collection to support the traffic analysis.

Analysis Periods and Scenarios

The weekday A.M. and P.M. peak hours for the 2022 existing conditions, as well as a five-year study horizon year of 2027 as the full buildout and occupancy would be expected by 2027.

Background Developments

The following background development would be considered for traffic analysis:

- Molinaro Group lands consisting of 769, 779, 783 Brant Street & 2023, 2027, 2031, 2033 Ghent Avenue
- 2095 Prospect Street

Please provide any additional background developments in the vicinity of the proposed development and the associated transportation impact studies that should be included in our analysis.

Future Background Growth Rate

A background growth rate of 1% compounded annually for through traffic movements along Brant Street and Fairview Street is proposed to be applied to the traffic volumes.

Please advise 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 using Multifamily Housing (High-Rise) Residential (Land Use Code 222). We do not propose to conduct additional trip generation for the ground floor retail at the site considering the site access will be primarily served for residents only.

Site generated traffic to and from the boundary road network will be assigned using 2016 Transportation Tomorrow Survey (TTS) data.

Capacity Analysis Procedures

Weekday A.M. and P.M. peak hours will be analyzed using Synchro 11.0 analysis software, using Highway Capacity Manual (HCM) 2000 procedures.

Site Distance Analysis

The sight lines at the existing site excess will be analyzed with regards to guidance within the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), June 2017.

Vehicle Maneuvering Analysis

A vehicle maneuvering assessment will be conducted using AutoTURN application that demonstrates the design vehicles can maneuver throughout the site including the underground parking garage. It will include circulation of passenger, emergency, loading and waste vehicles. It is noted that the OPA/ZBA submission will primarily focus on ground level maneuvering for the site while the subsequent TIS submission for SPA will include a more detailed review of all internal maneuvering for the site.

Parking Justification

The parking spaces will be assessed with respect to the City of Burlington's "Zoning By-Law Section 2.25" as well as the 2020 proposed amendment to the By-law to determine whether the proposed parking supply at the site meets the requirements.

Based on the current plans a parking ratio of approximately 0.89 space/unit is proposed to support the site, which would be significantly below the new 2020 City of Burlington parking rate requirements. However, the site is located in very close proximity to Burlington GO Transit as well as local transit routes that will support lower vehicle ownership for future residents.

For the Parking Justification Study, we will complete the following:

- Review the minimum vehicle parking requirements for the proposed development per the City of Burlington Zoning By-Law Section 2.25 and compare the requirements with the proposed supply.
- Forecast the peak parking demand at the site based on parking survey data and ITE Parking Generation Manual.
- Compare to other recent development approvals such as at 409 Brant Street in 2018, which resulted in approved parking rate of 0.80 spaces/unit for residents in 2018 that is significantly lower than the required Zoning By-Law parking requirements
- Identify Transportation Demand Management (TDM) opportunities available at the site to assess potential site-specific measures that may be used to further support a reduced parking supply.
- Based on the findings, confirm the adequacy of the proposed parking supply to support the development.

Please confirm the above scope of work and the need for a parking justification study to support the proposed parking supply.

Transportation Demand Management (TDM) Plan and Multimodal Transportation Review

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. Transit, cycling and pedestrian infrastructure in the vicinity of the site will also be assessed and recommendations related to how the site can integrate and support the existing multi-modal infrastructure will be made.

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

- Please confirm the use of the 2019 traffic counts conducted as part of the Paradigm TIS are acceptable for use within the TIS.
- Please provide signal timing plans available for the intersections of study identified in this Terms of Reference.
- Please confirm if the assumed growth rate is applicable or provide relevant growth rate(s) applicable to the roadways of study.
- Please confirm and provide any additional relevant background developments, as well as the associated traffic impact studies that are to be included in our study.
- Please provide details of any planned roadway or transit improvements in the surrounding study area within the proposed horizon year(s).
- Please confirm the need for a Parking Justification Study and the proposed scope of work.

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 us.

Kind regards,

Aarzoo Dhanani

Aarzoo Dhanani, EIT, M.Eng. | 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.

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Aarzoo Dhanani

From: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Sent: Tuesday, July 12, 2022 2:53 PM
To: Aarzoo Dhanani
Subject: RE: Terms of Reference- 795 Brant Street (CFC# 2321-6440)

Categories: TO Do's

Hi Aarzoo,

The background developments that you have provided is fine. For Signal Timings please email Steve Vrakela (Steve.vrakela@burlington.ca). A 1% growth is an acceptable number to be used. In terms of Capital Projects there is one located near your site. Prospect street from Brant Street to Cumberland Ave. will be under construction in 2025. The description of the Construction is as follows "Prospect St has been identified as requiring a resurfacing. This process involves the removal and replacement of the asphalt surface and replacement of deficient curbs and sidewalk. In addition, Halton Region has identified a need to replace one or both." The correct intersections have been included in the study. 2018 is acceptable data to be used for the study, but make sure they meet our guidelines for when they were conducted. Please refer to this report for your parking justification City-wide Parking Standards Review - City of Burlington. Lastly Burlington Transit has stated "As of right now, we do not have plans to increase either the number of routes, or the number of stops that are relevant to this property; but this would be reassessed should we receive a Request for Comments on the previously stated development applications."

If you need clarification on anything or have any other questions please let me know.

All the best,

Zachary Tessaro
Transportation Planning Technologist
Transportation

(905) 335-7600 ext. 7691
zachary.tessaro@burlington.ca

From: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Sent: Monday, July 11, 2022 4:12 PM
To: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Cc: Brandon Bradt <bbradt@cfcrozier.ca>
Subject: RE: Terms of Reference- 795 Brant Street (CFC# 2321-6440)

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Thanks for the quick update Zach! I appreciate it.

Aarzoo Dhanani, EIT, M.Eng. | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392



Crozier Connections:

Read our latest news and announcements here.

From: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Sent: Monday, July 11, 2022 4:08 PM
To: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Subject: RE: Terms of Reference- 795 Brant Street (CFC# 2321-6440)

Hi Aarzoo,

I should have my full reply to your request soon. Sorry about the delay.

All the best,

Zachary Tessaro
Transportation Planning Technologist
Transportation

(905) 335-7600 ext. 7691
zachary.tessaro@burlington.ca

From: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Sent: Monday, July 11, 2022 4:05 PM
To: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Cc: Brandon Bradt <bbradt@cfcrozier.ca>
Subject: FW: Terms of Reference- 795 Brant Street (CFC# 2321-6440)

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Hey Zach,

Hope you had a good weekend!

Just following up on our terms of reference below. Please let us know if you have any questions!

Regards,

Aarzoo

Aarzoo Dhanani, EIT, M.Eng. | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

CROZIER
CONSULTING ENGINEERS

Crozier Connections:

Read our latest news and announcements here.

From: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Sent: Wednesday, July 6, 2022 3:58 PM
To: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Cc: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Subject: RE: Terms of Reference- 795 Brant Street (CFC# 2321-6440)

Zach is reviewing this one as well.

Thanks,

Dan Ozimkovic, C.E.T., A.Sc.T.
Transportation Planning Technologist
Transportation Services Department
City of Burlington
Our working hours may be different. You are not obligated to reply outside of your typical working hours.

From: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Sent: Wednesday, July 6, 2022 3:33 PM
To: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Cc: Brandon Bradt <bbradt@cfcrozier.ca>
Subject: RE: Terms of Reference- 795 Brant Street (CFC# 2321-6440)

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Hey Dan,

We are looking to follow up on our Terms of Reference below. Attached are the comments received from the Halton Region regarding our scope and workplan.

The region agreed on the use of 2019 traffic counts for the intersection of Fairview Street and Brant Street. However, it is noted that the counts collected by Paradigm for the intersection are from 2018 and we are hoping to know if that is acceptable?

Please let us know if you have any questions of concern!

Regards,

Aarzoo

Aarzoo Dhanani, EIT, M.Eng. | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

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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 us.

Kind regards,

Aarzoo Dhanani

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APPENDIX B

Site Plan

789-795 BRANT STREET

BURLINGTON, ON L7R 2J3



CAMARRO DEVELOPMENTS

Project: 21001
Date: 2022-08-26
Issued for: REZONING

ARCHITECTURAL DRAWING LIST	
SHEET NUMBER	**SHEET NAME**
A000 - GENERAL	
A000	COVER / DRAWING LIST
A001	CONTEXT PLAN, PROJECT STATISTICS
A002	WASTE MANAGEMENT PLAN
A100	SITE PLAN
A100 - SUBSTRUCTURE FLOOR PLANS	
A101	BELOW GRADE LEVELS - TYPICAL
A102	BELOW GRADE LEVELS -P1
A200 - ARCHITECTURAL PLANS	
A200	GROUND FLOOR PLAN
A201	MEZZANINE FLOOR PLAN
A202	SECOND TO FIFTH FLOOR PLAN
A206	SIXTH FLOOR PLAN
A207	SEVENTH FLOOR PLAN
A208	EIGHT FLOOR PLAN
A209	NINTH FLOOR PLAN
A210	TENTH TO THIRTIES FLOOR PLAN
A231	PENTHOUSE MECHANICAL FLOOR PLAN
A400 - BUILDING ELEVATIONS	
A400	BUILDING ELEVATIONS
A401	BUILDING ELEVATIONS
A500 - BUILDING AND WALL SECTIONS	
A500	BUILDING SECTIONS
A501	BUILDING SECTION

PROJECT CONSULTANTS

ARCHITECTURAL
RAW DESIGN
405-317 ADELAIDE ST. WEST
TORONTO, ONTARIO
M5V 1P9
416-599-9729

SITE SERVICING
S. LLEWELLYN AND ASSOCIATES LIMITED
3228 SOUTH SERVICE RD. SUITE 105, EAST WING
BURLINGTON, ON
L7N 3H8
905-631-6978

TRAFFIC ENGINEER
CROZIER CONSULTING ENGINEERS
211 YONGE STREET #301
TORONTO, ONTARIO,
M5B 1M4
416.477.3392

LANDSCAPE ARCHITECT
MHBC - PLANNING, URBAN DESIGN & LANDSCAPE
7050 WESTON ROAD, SUITE 230
WOODBRIDGE, ONTARIO
L4L 8G7
905-761-5588

WIND STUDY
RWDI
600 SOUTHGATE DRIVE
GUELPH, ONTARIO,
N1G 4P6
519.823.1311

SURVEYOR
A.J. CLARKE & ASSOCIATES LTD.
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO
L8P 1H1
905.528.8761

PLANNING
MHBC - PLANNING, URBAN DESIGN & LANDSCAPE
442 BRANT STREET, SUITE 204
BURLINGTON, ONTARIO
L7R 2G4
905 639 8686

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ISSUE RECORD
2022-08-26 Issued for Rezoning

REVISION RECORD
NO. DATE DESCRIPTION

RAW
405-317 ADELAIDE STREET WEST
TORONTO CANADA M5V 1P9
+1 416.599.9729
WWW.RAWDESIGN.CA

21001

789-795 BRANT STREET

CAMARRO DEVELOPMENTS

COVER / DRAWING LIST

A000

2022-09-08 11:18:59 AM

	m²	sf
SITE AREA	2,283.8	24582

AREA CALCULATIONS

FLOOR	1B	1B+D	2B	3B	TOTAL	RESIDENTIAL GCA	INDOOR AMENITY	OUTDOOR AMENITY	RES. BALC & TERRACES	RETAIL GCA	OVERALL GCA		GFA EXC.	OVERALL GFA	
						m²	m²	m²	m²	m²	m²	sf	m²	m²	sf
BELOW GROUND															
P5											2097	22572	2097	0	0
P4											2097	22572	2097	0	0
P3											2097	22572	2097	0	0
P2											2097	22572	2097	0	0
P1											2097	22572	2097	0	0
ABOVE GROUND															
1			3		3	687			92	485	1172	12615	508	664	7147
M						449			15		449		209	240	
2	5	2	12	2	21	1683			75		1683	18116	200	1483	15963
3	5	2	12	2	21	1683			60		1683	18116	200	1483	15963
4	5	2	12	2	21	1683			75		1683	18116	200	1483	15963
5	5	2	12	2	21	1683			60		1683	18116	200	1483	15963
6	1	2	12	2	17	1580	108	112	59		1580	17007	195	1385	14908
7	1	2	6		9	937	171	528	30		937	10086	131	806	8676
8					0	412	304	382			412	4435	77	335	3606
9	3	1	2		6	447			19		447	4811	86	361	3886
10	6	1	3	1	11	760			63		760	8181	84	676	7276
11	6	1	3	1	11	760			48		760	8181	84	676	7276
12	6	1	3	1	11	760			63		760	8181	84	676	7276
13	6	1	3	1	11	760			48		760	8181	84	676	7276
14	6	1	3	1	11	760			63		760	8181	84	676	7276
15	6	1	3	1	11	760			48		760	8181	84	676	7276
16	6	1	3	1	11	760			63		760	8181	84	676	7276
17	6	1	3	1	11	760			48		760	8181	84	676	7276
18	6	1	3	1	11	760			63		760	8181	84	676	7276
19	6	1	3	1	11	760			48		760	8181	84	676	7276
20	6	1	3	1	11	760			63		760	8181	84	676	7276
21	6	1	3	1	11	760			48		760	8181	84	676	7276
22	6	1	3	1	11	760			63		760	8181	84	676	7276
23	6	1	3	1	11	760			48		760	8181	84	676	7276
24	6	1	3	1	11	760			63		760	8181	84	676	7276
25	6	1	3	1	11	760			48		760	8181	84	676	7276
26	6	1	3	1	11	760			63		760	8181	84	676	7276
27	6	1	3	1	11	760			48		760	8181	84	676	7276
28	6	1	3	1	11	760			63		760	8181	84	676	7276
29	6	1	3	1	11	760			48		760	8181	84	676	7276
30	6	1	3	1	11	760			63		760	8181	84	676	7276
MPH	3	1	2		6	786			24		786	8460	426	360	3875
TOTAL	154	35	136	31	356	27,990	583	1,022	1,682	485	38,960	419,362	14,681	24,279	261,337
	43.26%	9.83%	38.20%	8.71%	100.00%										
min size	453	570	645	913											
max size	534	635	870	1043											

Note: Open to below areas have been excluded in GCA calculation.

FAR TOTAL 11.55

AMENITIES

	Required 20m2/1B	3780	m2	Indoor amenity Provided	583	m2
	Required 35m2/2B+	5845	m2	Outdoor amenity Provided	1022	m2
				Residential terraces & balcones	1682	
TOTAL		9625	m2		1605	m2

PARKING CALCULATIONS

VEHICLE PARKING	Required					Provided						
	1B (1.25)	1B+D (1.25)	2B (1.25)	3B (1.25)		G	P1	P2	P3	P4	P5	TOTAL
RESIDENTIAL & Maintenance	193	44	170	39	445			57	57	57	55	226
RETAIL + VISITOR (3.5/100sm of GFA)					17		53					53
TOTAL					462		53	57	57	57	55	279
BF 2+ 2%					8							
EVSE 20%					92							

	0.63	RES PARKING RATIO							
	0.15								
	0.78	Combined ratio							

BICYCLE PARKING

	LONG-TERM	LONG-TERM				SHORT-TERM			
	Required	Required		Provided		Required		Provided	
RESIDENTIAL		0.5/Units	178	G		0.5/Units	18		18
	(0.9/unit)			P1	124				
	0.2/100m2			P2	54				
TOTAL					178				



Context Plan
NTS

SITE STATS
NTS

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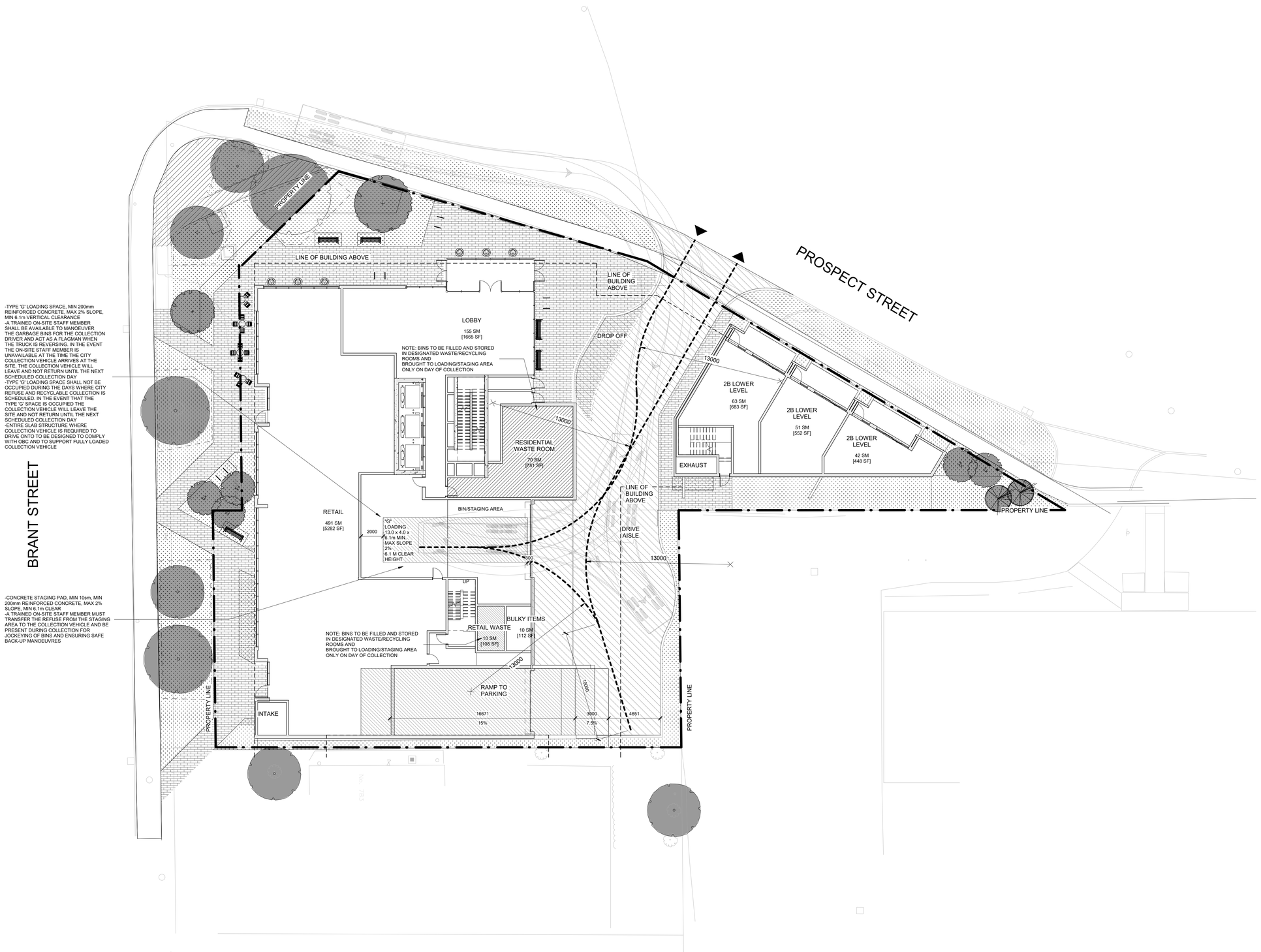
789-795 BRANT STREET

CAMARRO DEVELOPMENTS

CONTEXT PLAN, PROJECT STATISTICS

As indicated

A001



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CAMARRO DEVELOPMENTS

WASTE MANAGEMENT PLAN

1 : 150

A002

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SITE PLAN LEGEND

00.00	EXISTING ELEVATION
+ 00.000	PROPOSED ELEVATION
+ 00.000 T.O.S.	TOP OF STRUCTURE
+ 00.000 T.O.W.	TOP OF WALL
+ 00.000 T.O.C.	TOP OF CURB
	VEHICULAR EXIT/ENTRANCE
	PEDESTRIAN EXIT/ENTRANCE
	PRIMARY RES ENTRANCE
	EXISTING EXTERIOR TO REMAIN
	NEW WALLS
	ITEM ABOVE
S	SCREEN REF. #
W	WALL TYPE
D	DOOR REF #

NOTES:
REFER TO CONSULTANTS DRAWINGS FORINFORMATION RELATING TO SITE SERVICING, GRADING AND LANDSCAPE. ALL ITEMS NEW CONSTRUCTION UNLESS NOTED OTHERWISE

Abbreviations

AD	AREA DRAIN
CACF	CENTRAL ALARM CONTROL FACILITY
CB	CATCH BASIN
FH	FIRE HYDRANT
FD	FLOOR DRAIN
HB	HOSE BIB
HLP	HYDRO LIGHT POLE
MH	MAN HOLE
TLS	TRAFFIC LIGHT STANDARD

SITE PLAN INFORMATION TAKEN FROM :

TOPOGRAPHIC PLAN SURVEY OF PART OF LOT X
REGISTERED PLAN XXXX
CITY OF XXXXX
PREPARED BY XXXX LAND SURVEYORS
(DATE).

XXX.Xm = 000 ESTABLISHED GRADE

XXX.Xm = TOS GROUND FLOOR AVERAGE

SITE PLAN NOTES

1. THE BUILDING IS TO BE [NOT SPRINKLERED] /[SPRINKLERED].

2. THE SOLID WASTE ROOMS IS XX SM AND AND WILL ACCOMMODATE GARBAGE VIA USE OF ONE CHUTE. GARBAGE CHUTE ACCCESS OCCURS ON LEVELS X,X AND X. ADDITIONAL BULK STORAGE IS PROVIDED AT A MINIMUM OF XXSM.

3. COLLECTION OF WASTE MATERIALS FOR THIS DEVELOPMENT WILL TAKE PLACE ON SITE IN THE LOADING AREA DESIGNATED ON THE GROUND FLOOR PLAN. AN ON-SITE TRAINED STAFF/ MAINTENANCE PERSON IS RESPONSIBLE FOR MOVING THE BINS FROM THE SOLID WASTE ROOM TO THE COLLECTION POINT AND PROVIDE VEHICULAR DIRECTIVES TO THE COLLECTION VEHICLE OPERATOR AS REQUIRED. IN THE EVENT THE ON-SITE STAFF IS UNAVAILABLE AT THE TIME THE CITY COLLECTION VEHICLE ARRIVES AT THE CITY, THE COLLECTION VEHICLE WILL LEAVE THE SITE AND NOT RETURN UNTIL THE NEXT SCHEDULED COLLECTION DAY.

4. SIDEWALKS AND BOULEVARDS WITHIN THE RIGHT OF WAY TO HAVE A MINIMUM 2% AND MAXIMUM 4% SLOPE TOWARDS THE ROADWAY.

5. REFER TO SITE SERVICING PLAN, FOR SEWER AND WATER SERVICE INFORMATION.

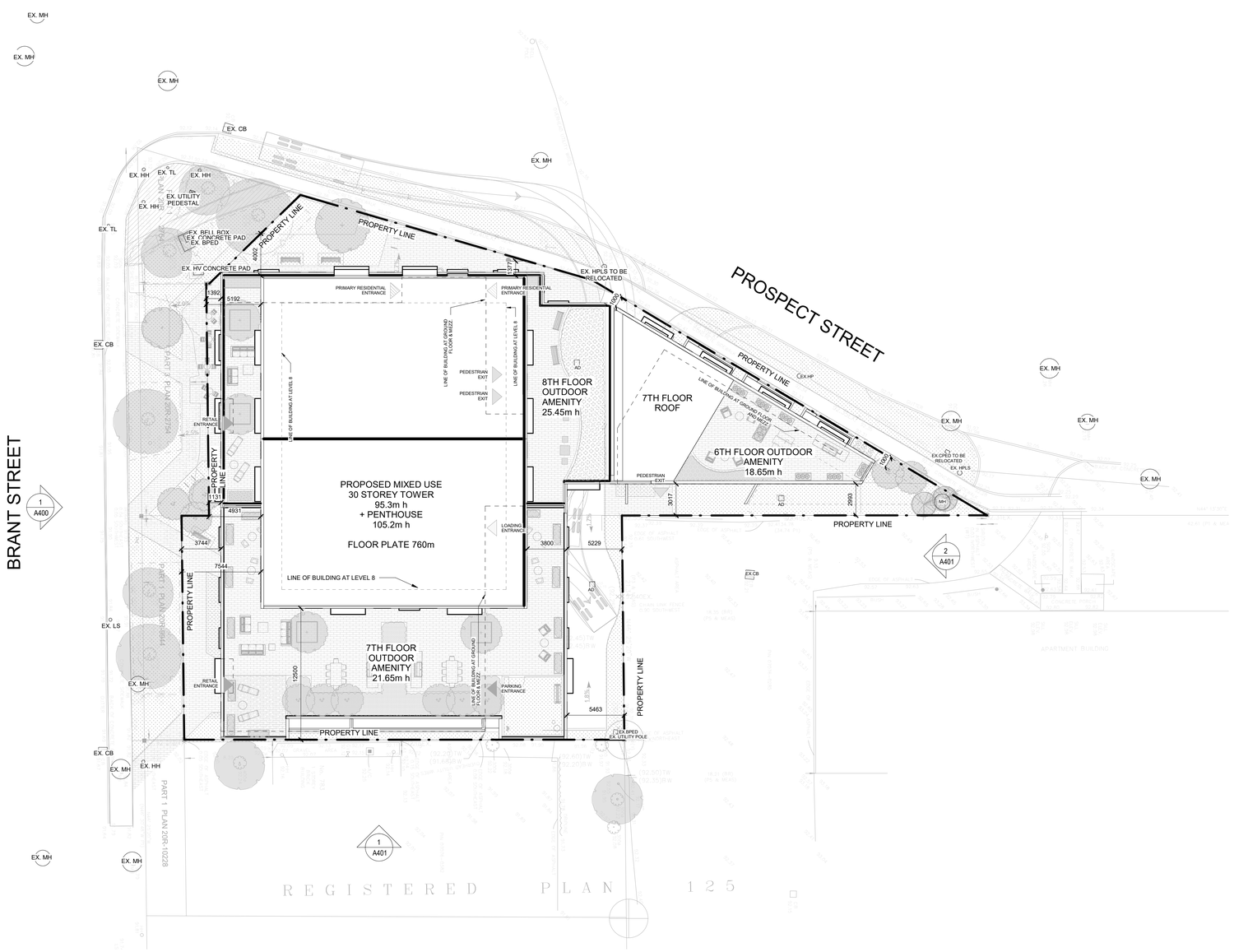
6. ALL EXISTING ACCESSES, CURB CUTS, TRAFFIC CONTROL SIGNS, ETC. ALONG THE DEVELOPMENT SITE FRONTAGE THAT ARE NO LONGER REQUIRED ARE TO BE REMOVED. THE BOULEVARD WITHIN THE PUBLIC RIGHT OF WAY, IN ACCORDANCE WITH CITY STANDARDS AND TO THE SATISFACTION OF THE EXECUTIVE DIRECTOR OF TECHNICAL SERVICES ARE TO BE REINSTATED.

7. PROPOSED ACCESS TO THE DRIVEWAY FOR THIS PROJECT TO BE DESIGNED IN ACCORDANCE WITH CITY STANDARD NO. T310-050-1 FOR COMBINED CURB AND SIDEWALK VEHICULAR ENTRANCES.

8. THIS BUILDING IS DESIGNED WITH A SHARED LOADING SPACE. A FLASHING WARNING LIGHT SYSTEM AND / OR APPROPRIATE SIGNAGE ADJACENT TO THE SPACE, AT NO COST TO THE CITY, WILL BE IN PLACE AND ACTIVATED DURING COLLECTION AND REMAIN ACTIVE UNTIL THE VEHICLE EXITS THE SITE.

9. SOLID WASTE MANAGEMENT TO BE NOTIFIED UPON COMPLETION OF THE DEVELOPMENT AND SHOULD PUBLIC WASTE COLLECTION BE USED, ALL NECESSARY APPLICATION AND WAIVER FORMS TO BE COMPLETED PRIOR TO COMMENCEMENT OF CITY REFUSE COLLECTION.

10. NO SPEED BUMPS SHALL BE INSTALLED ON ANY MAIN DRIVEWAY AISLE OR DESIGNATED FIRE ROUTE.



1 A100 **Site Plan** 1 : 200

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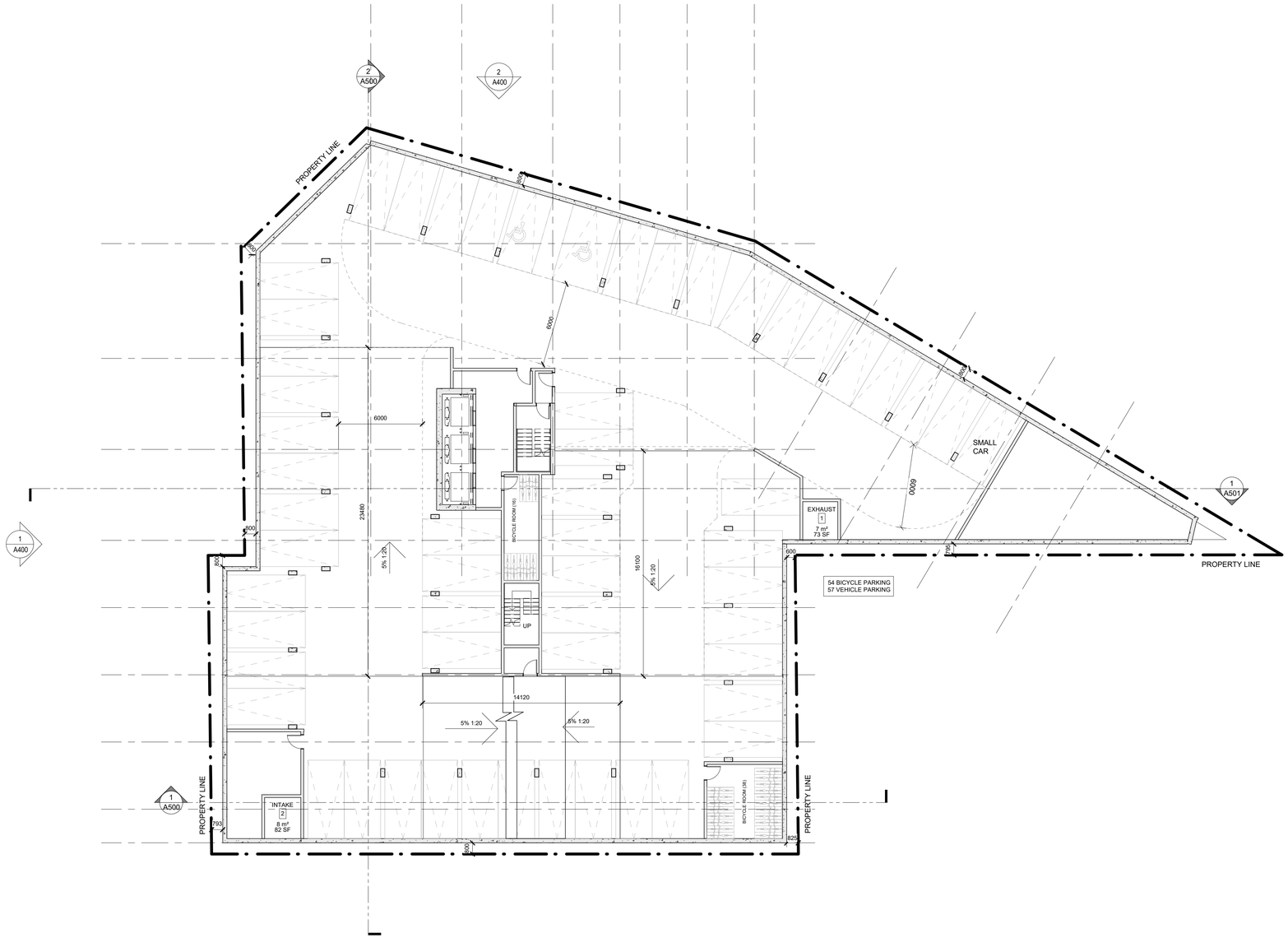
CAMARRO DEVELOPMENTS

SITE PLAN

As indicated

A100

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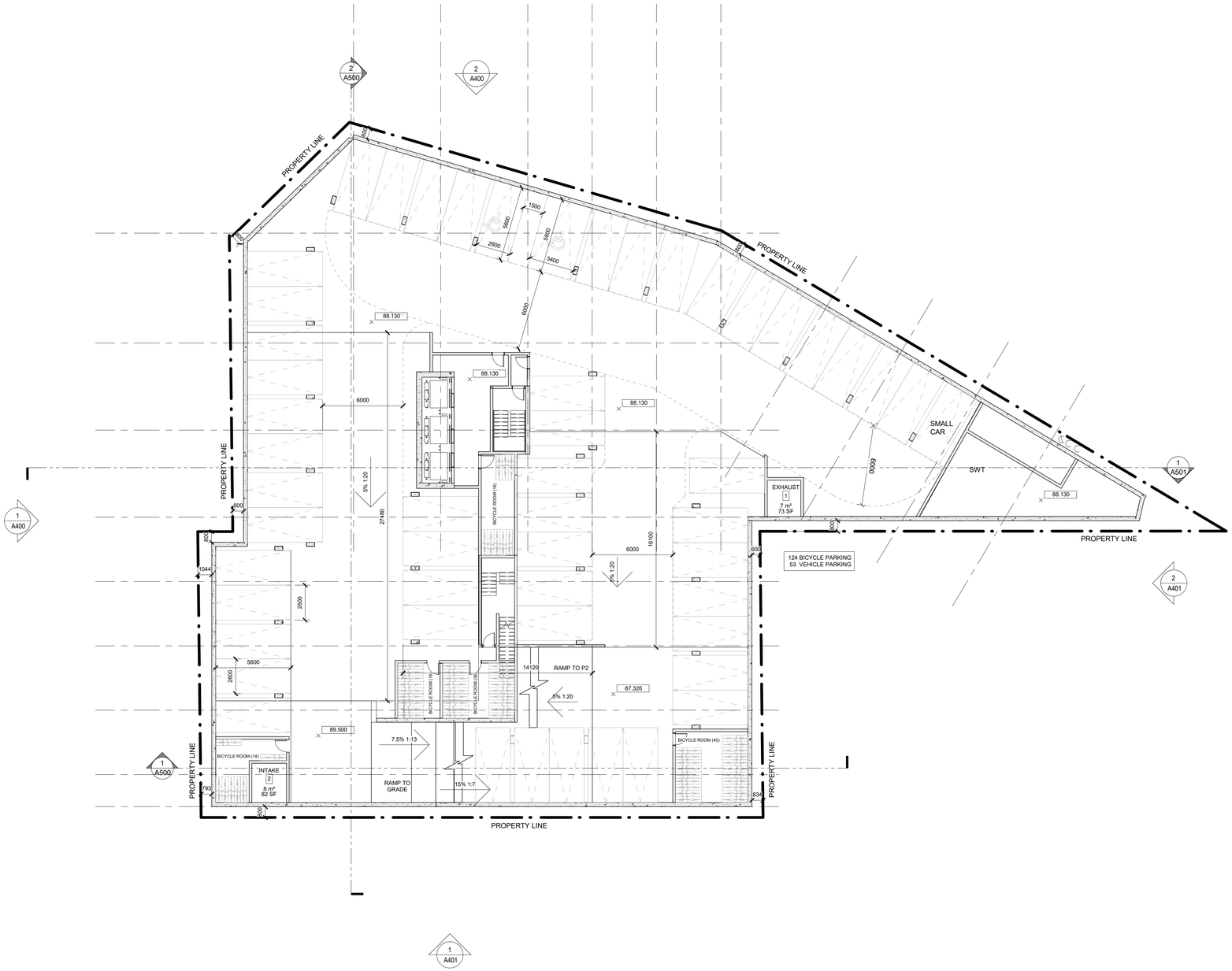
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BELOW GRADE LEVELS - TYPICAL

1 : 150

A101

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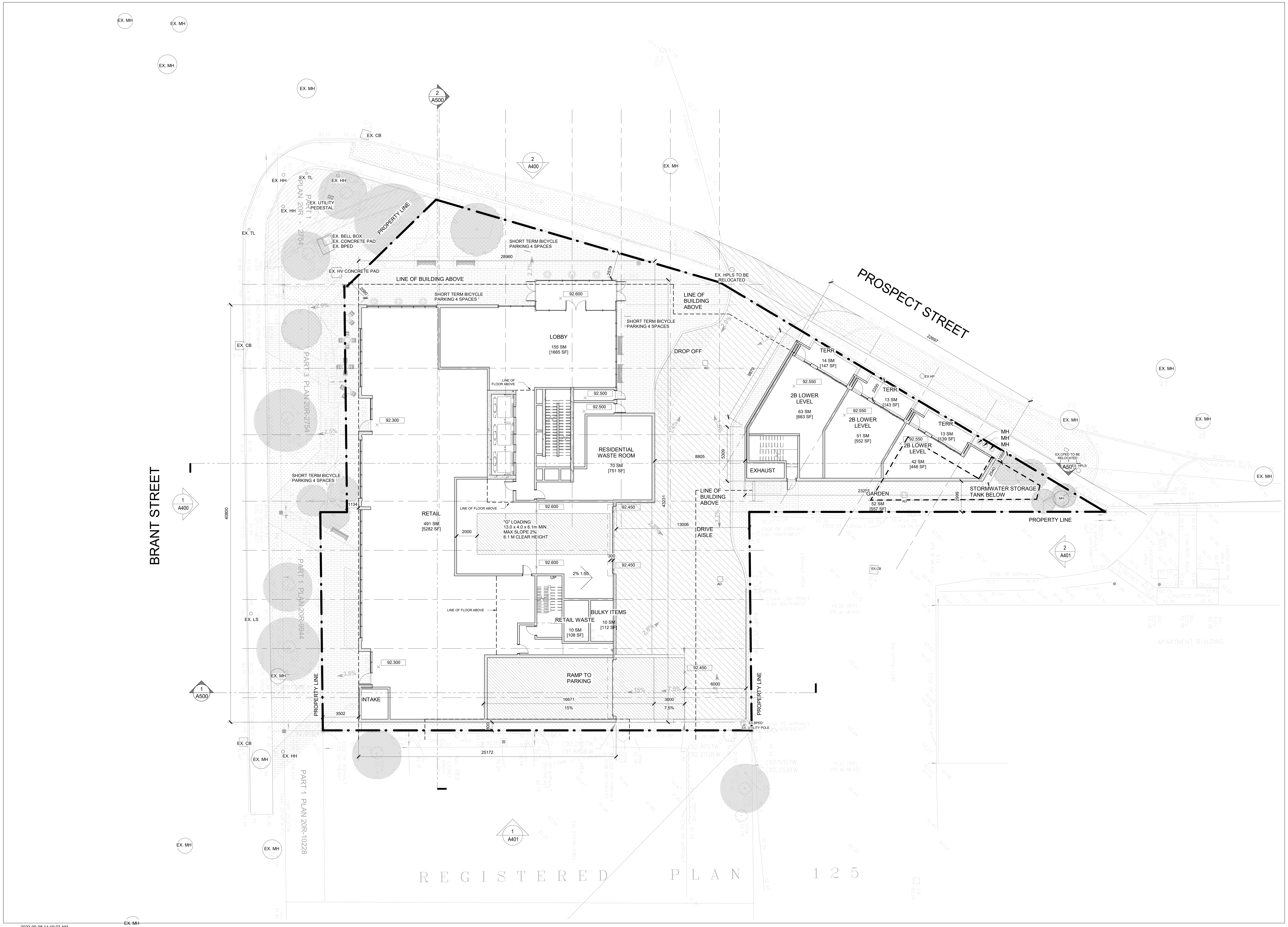
CAMARRO DEVELOPMENTS

BELOW GRADE LEVELS -P1

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A102

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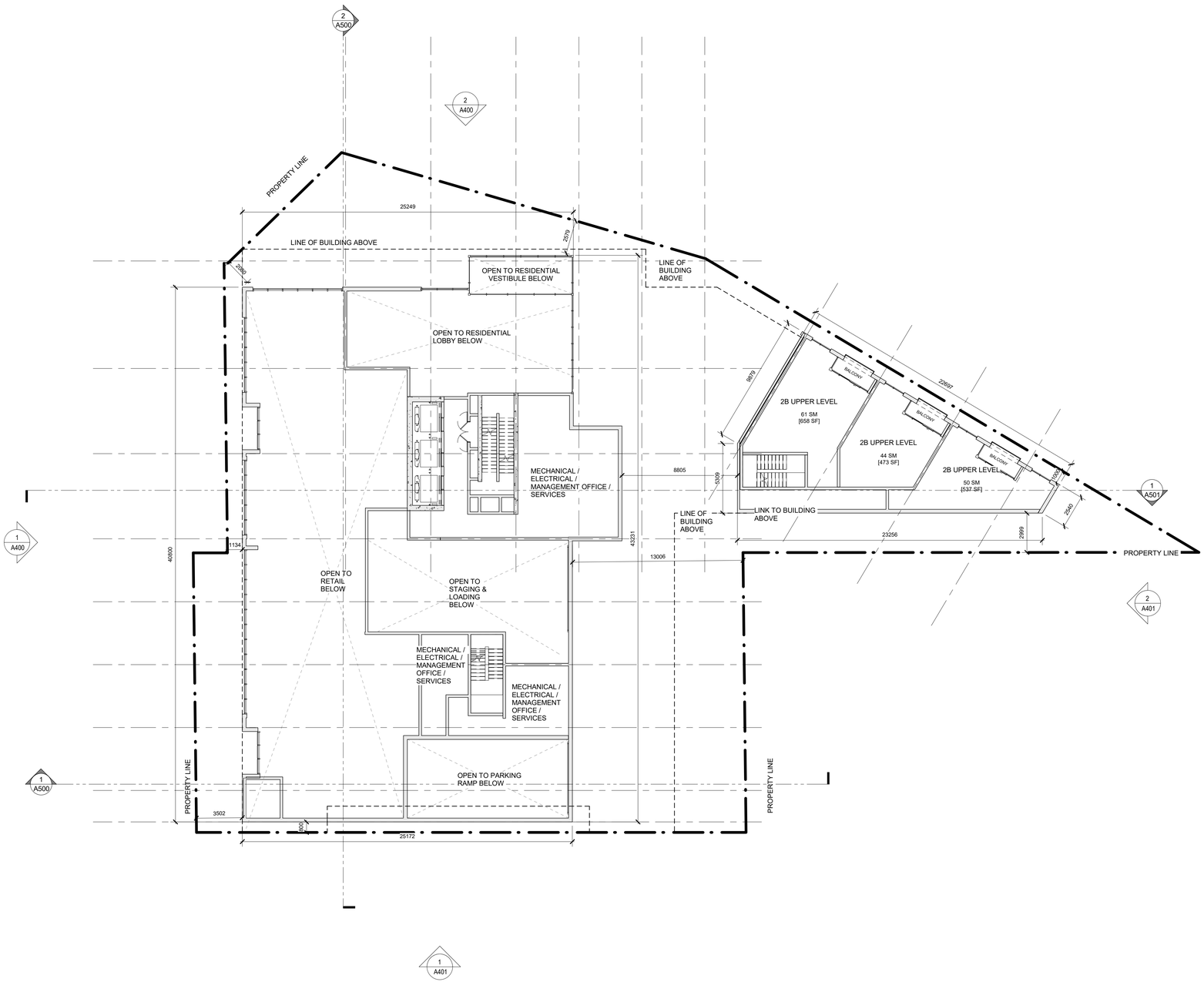
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CAMARRO DEVELOPMENTS

GROUND FLOOR PLAN

1 : 150

A200



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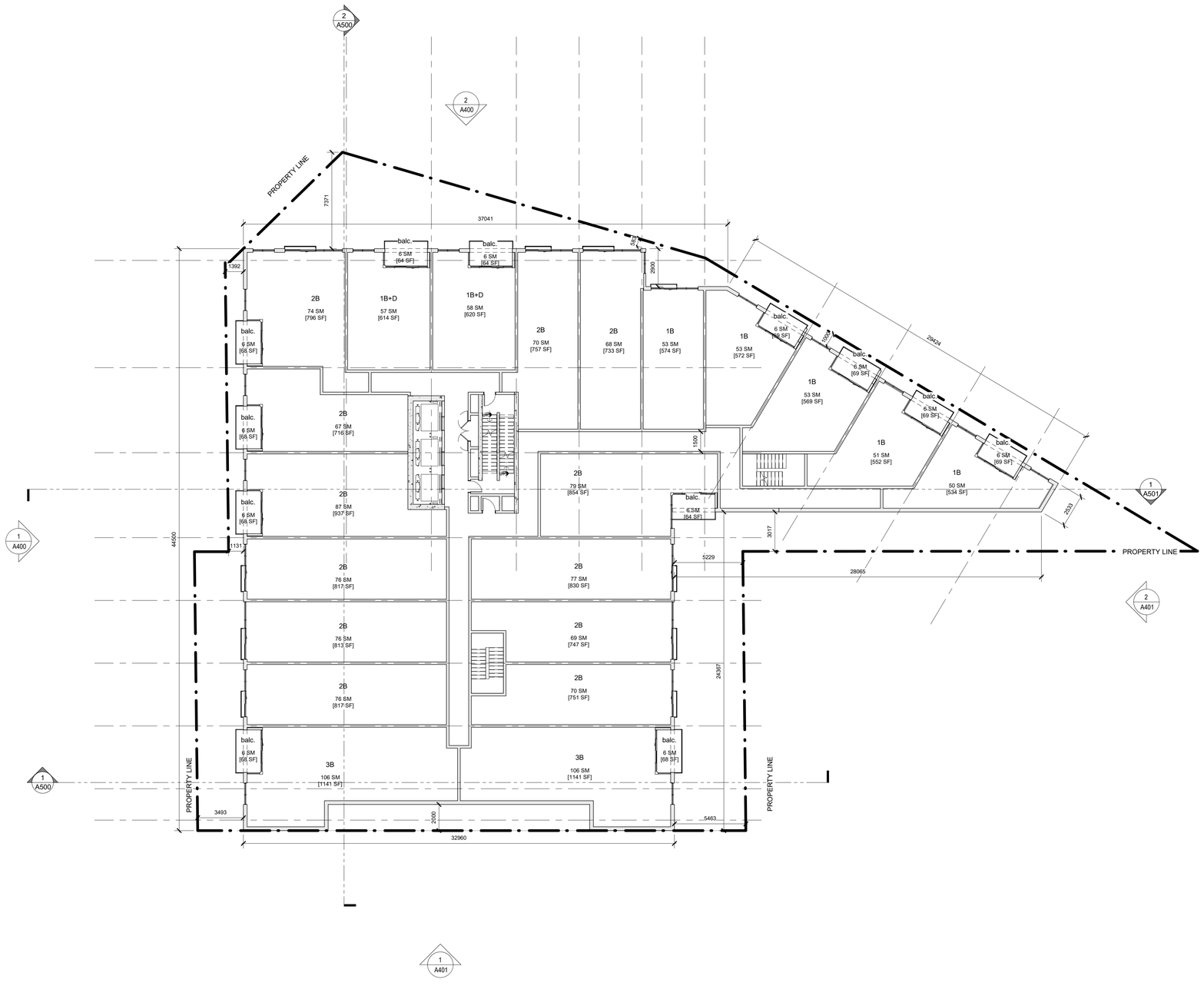
CAMARRO DEVELOPMENTS

MEZZANINE FLOOR PLAN

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A201

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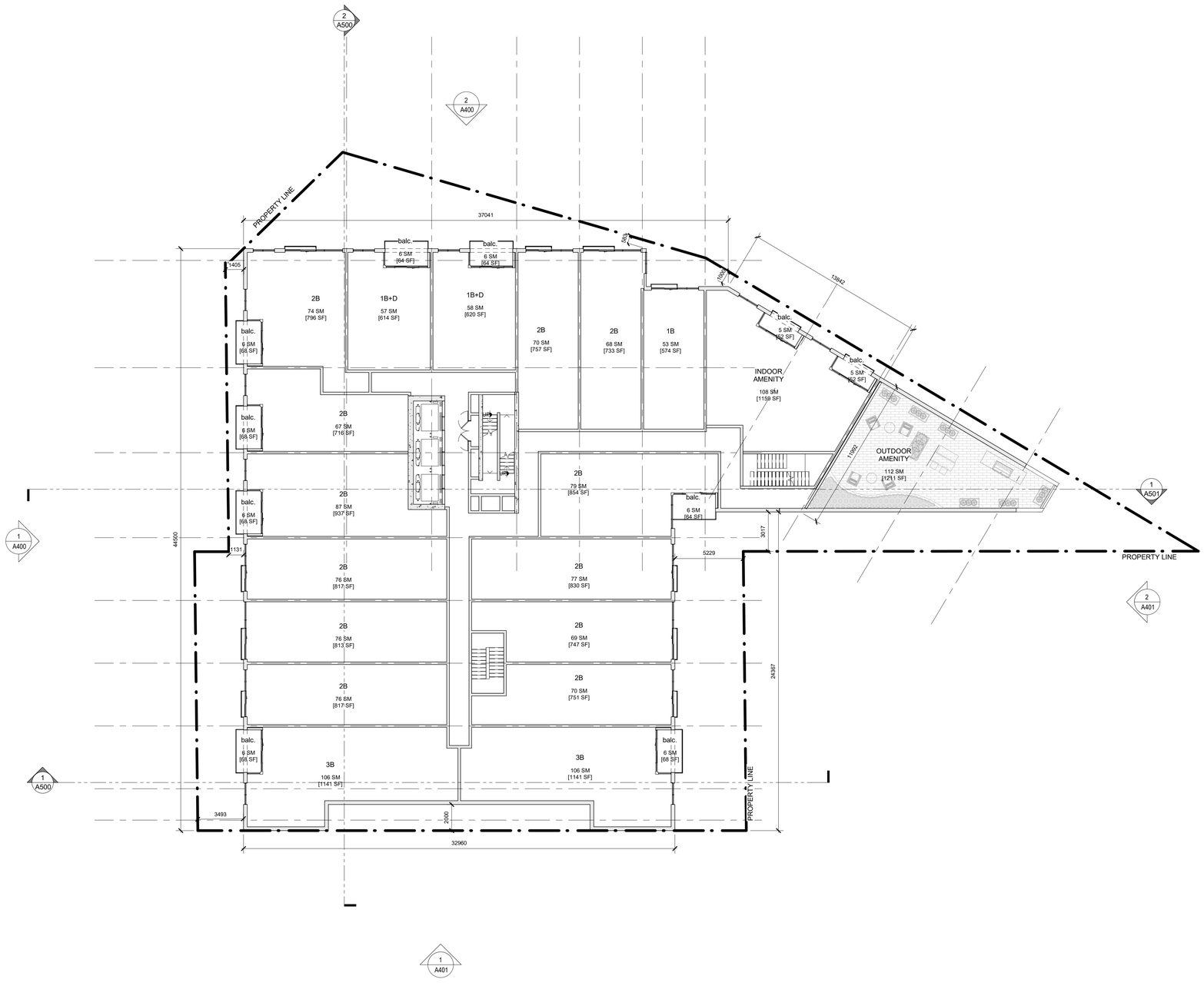
CAMARRO DEVELOPMENTS

SECOND TO FIFTH FLOOR PLAN

1 : 150

A202

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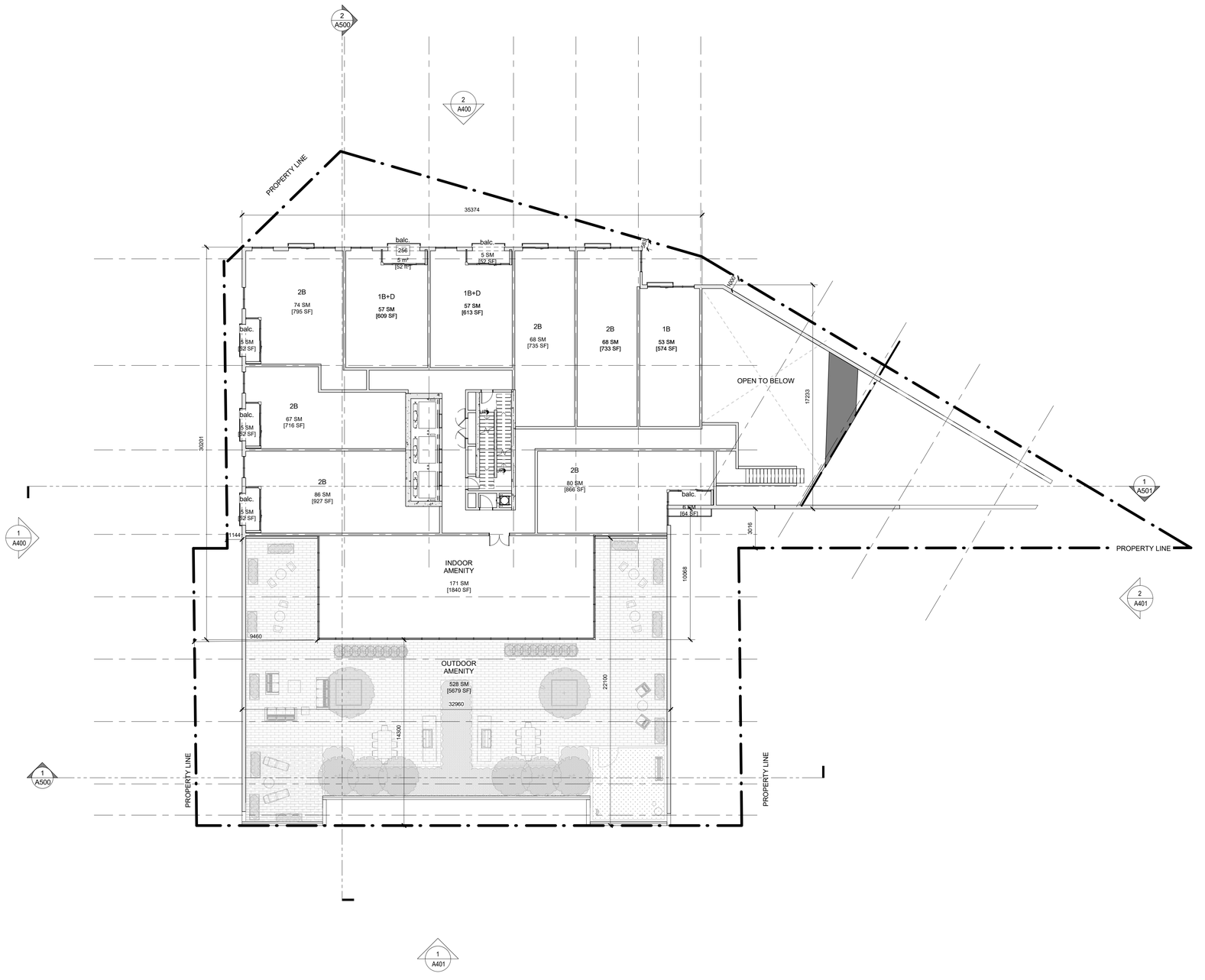
CAMARRO DEVELOPMENTS

SIXTH FLOOR PLAN

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A206

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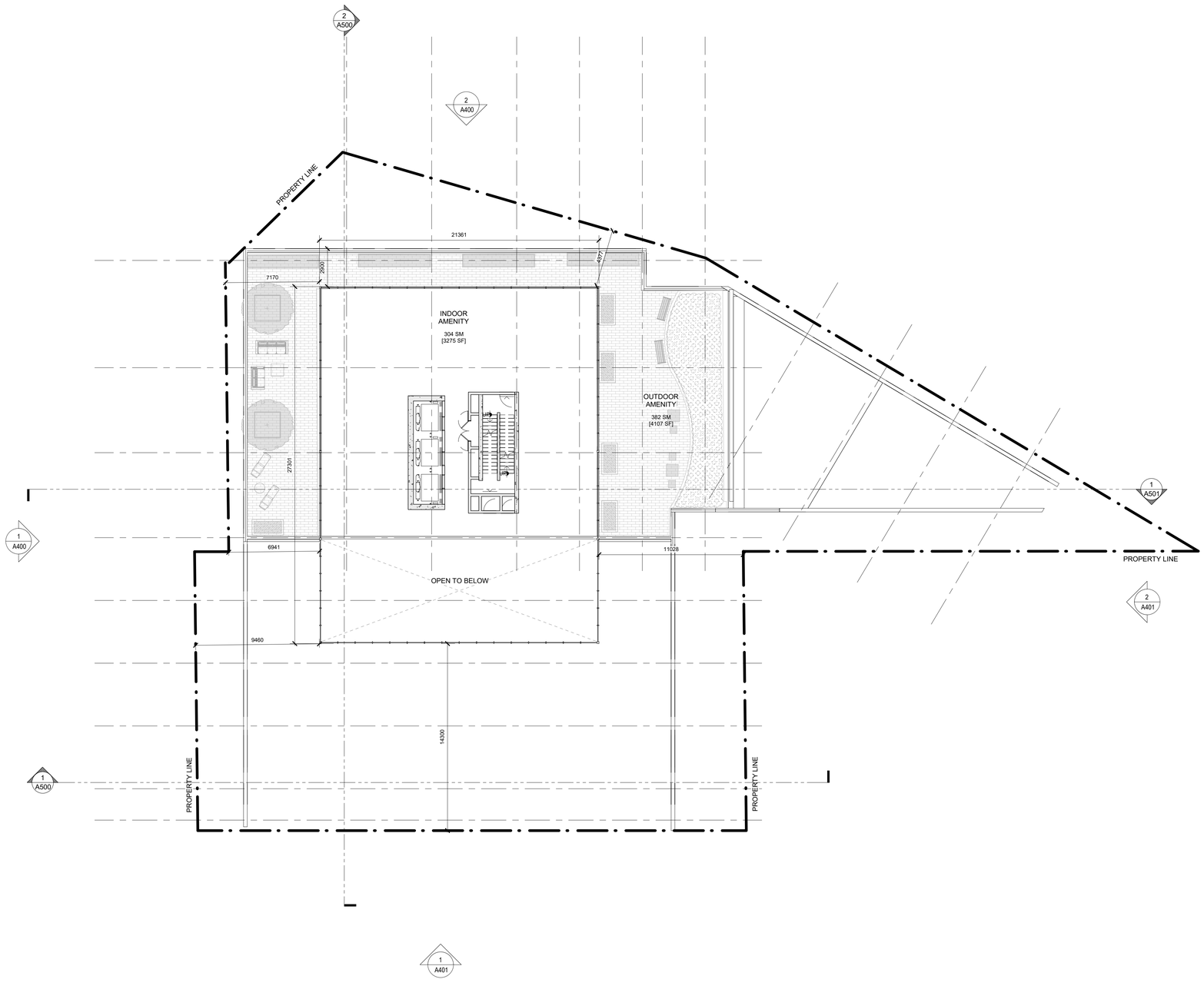
CAMARRO DEVELOPMENTS

SEVENTH FLOOR PLAN

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A207

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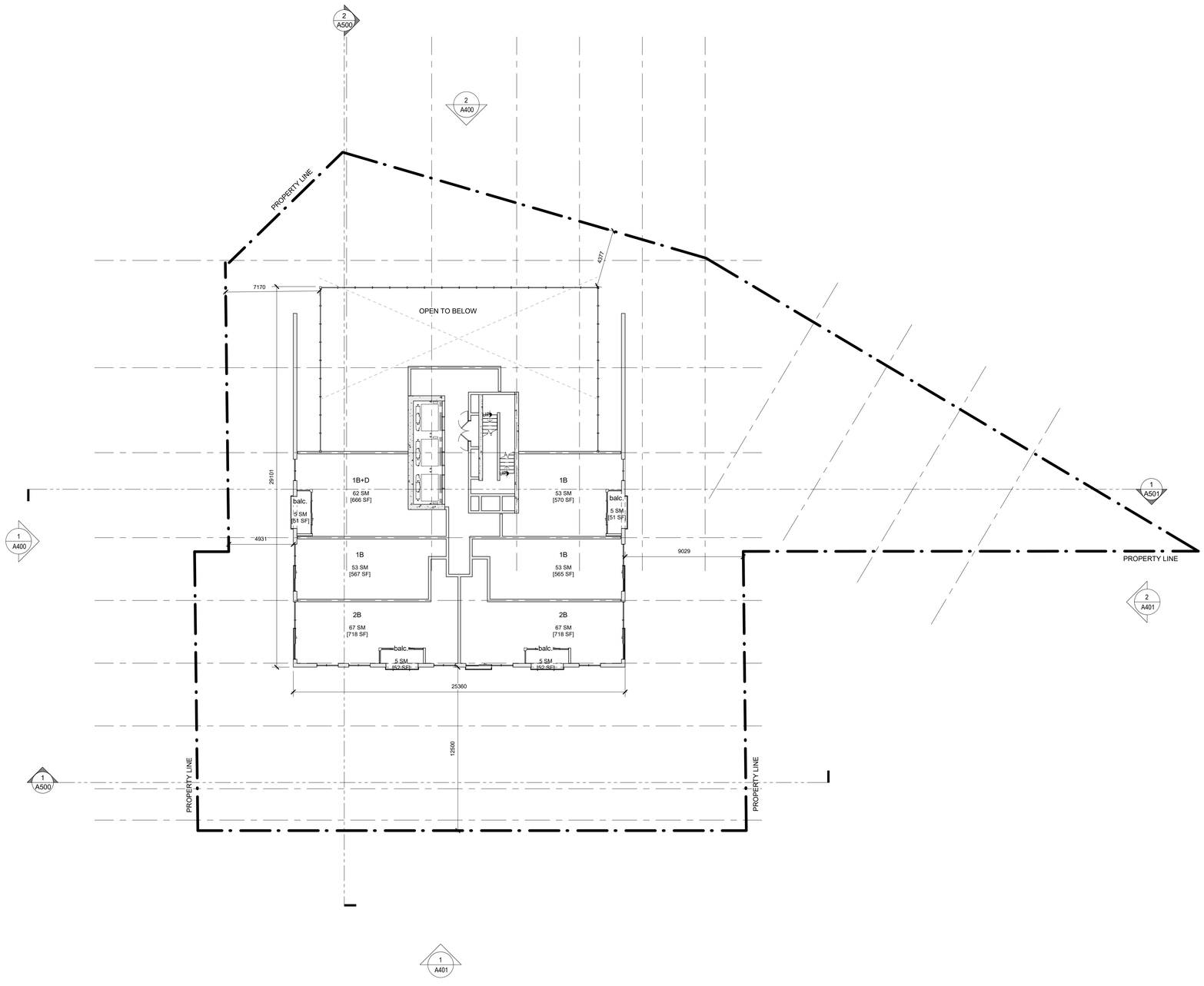
CAMARRO DEVELOPMENTS

EIGHT FLOOR PLAN

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A208

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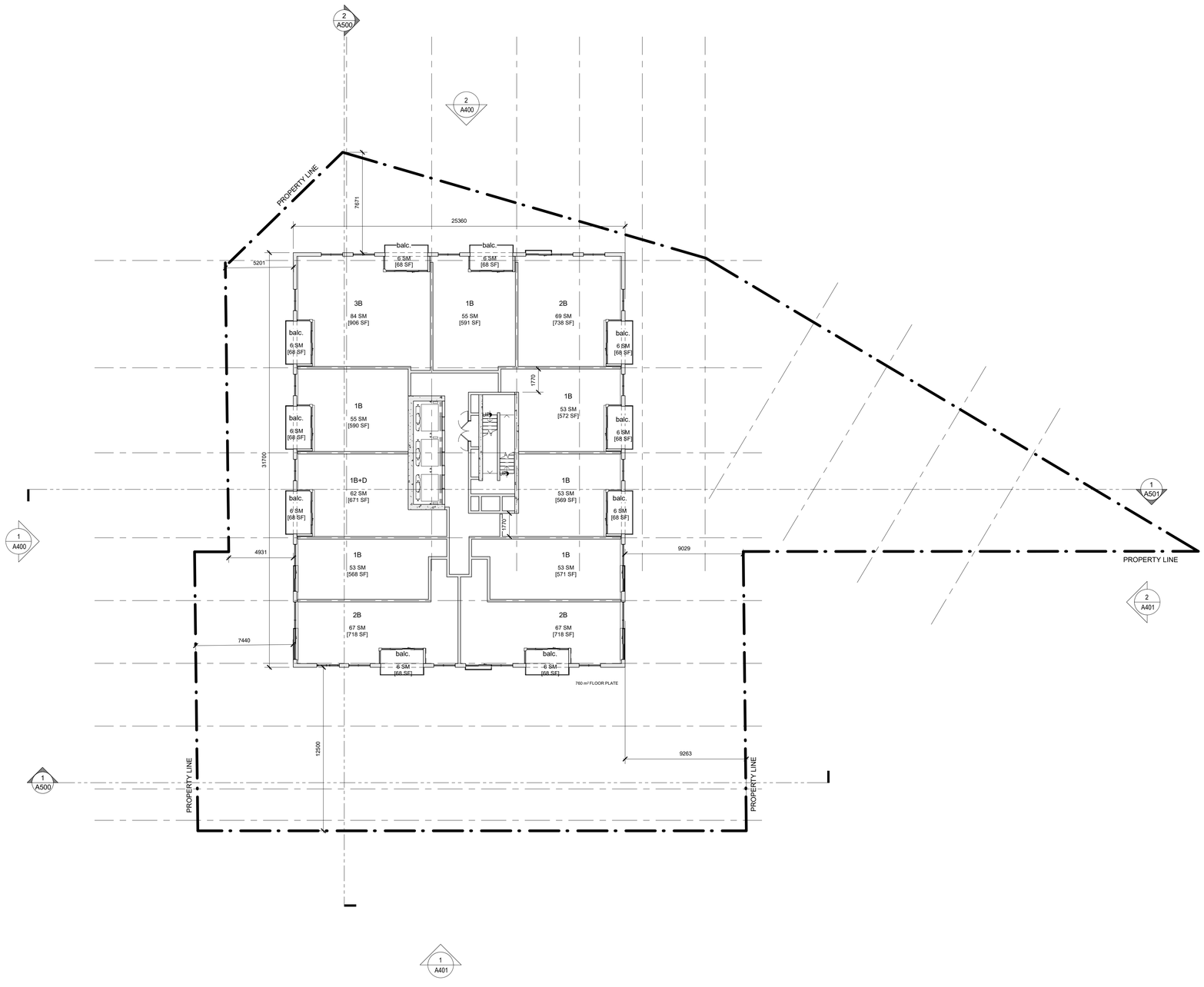
CAMARRO DEVELOPMENTS

NINTH FLOOR PLAN

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A209

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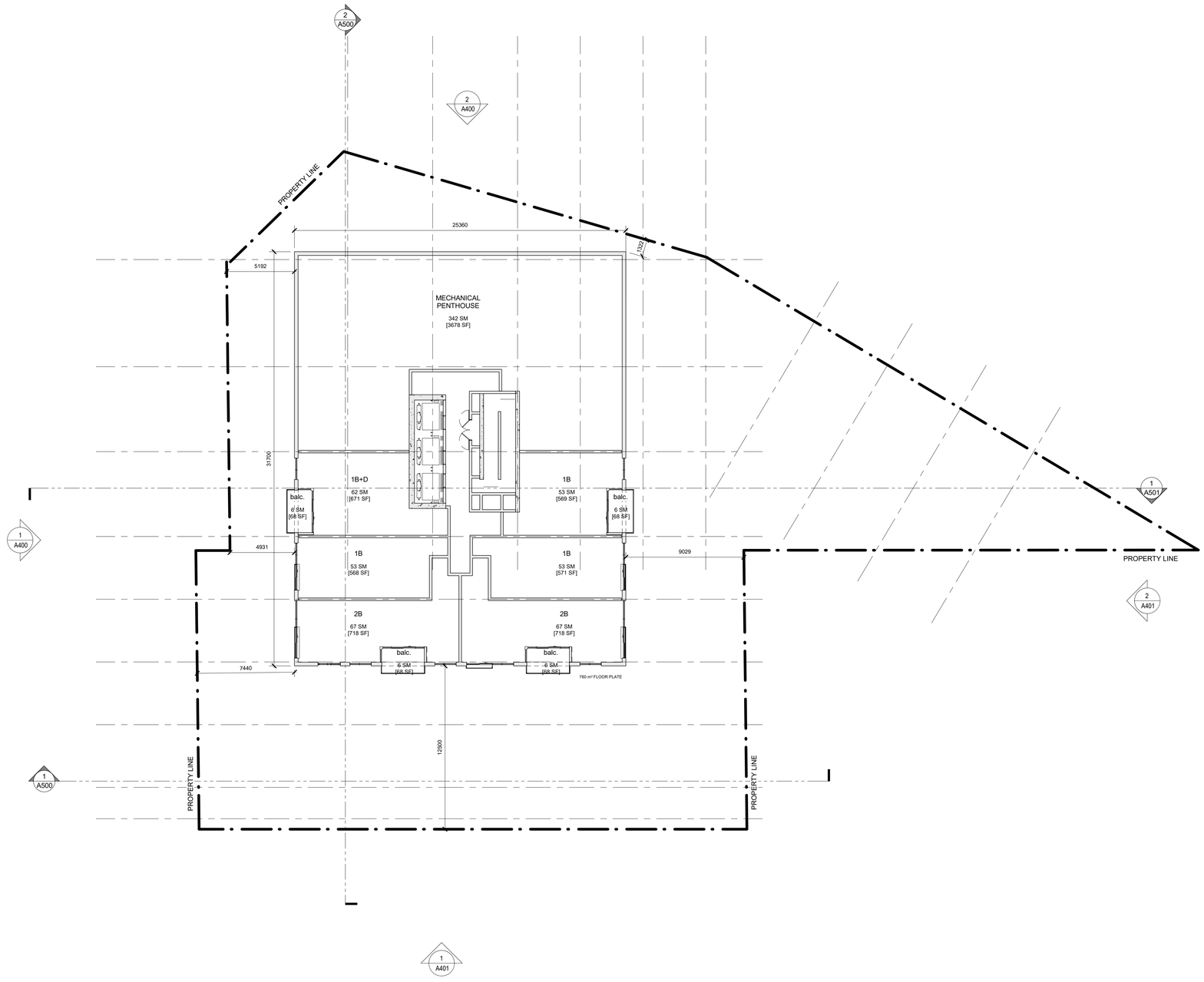
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TENTH TO THIRTIES FLOOR PLAN

1 : 150

A210

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CAMARRO DEVELOPMENTS

PENTHOUSE MECHANICAL FLOOR PLAN

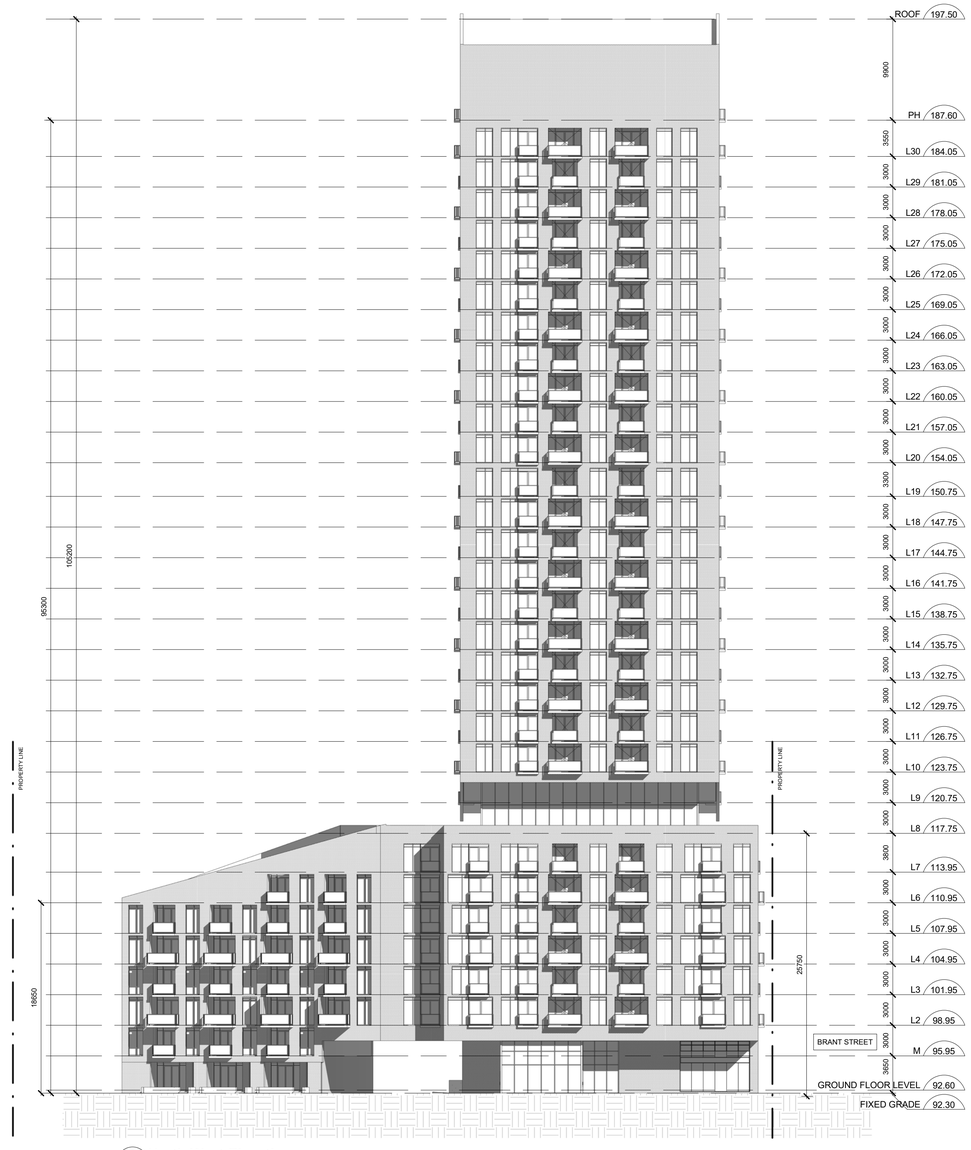
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1 A400 **South West Elevation**
1 : 250



2 A400 **North West Elevation**
1 : 250

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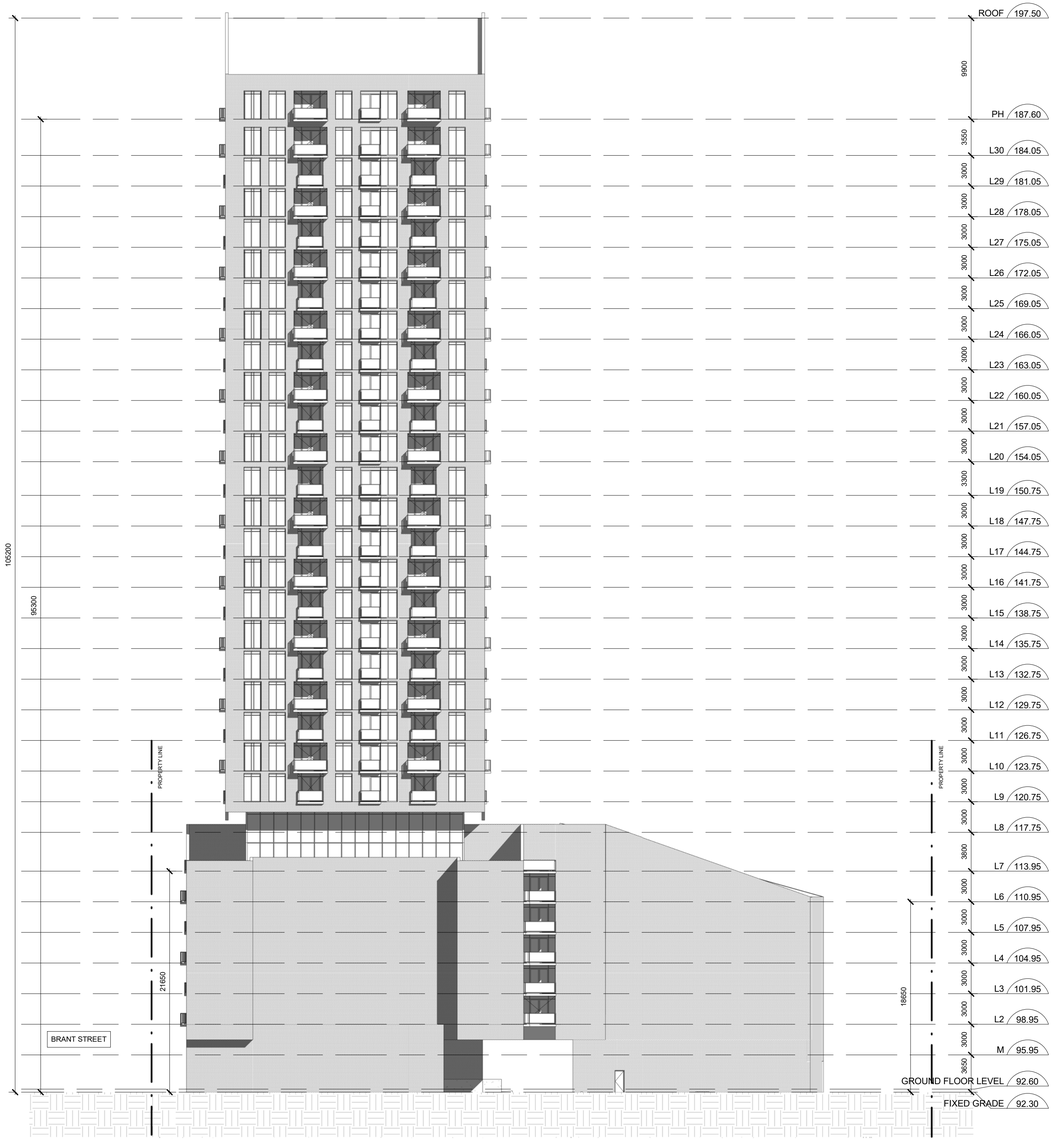
CAMARRO DEVELOPMENTS

BUILDING ELEVATIONS

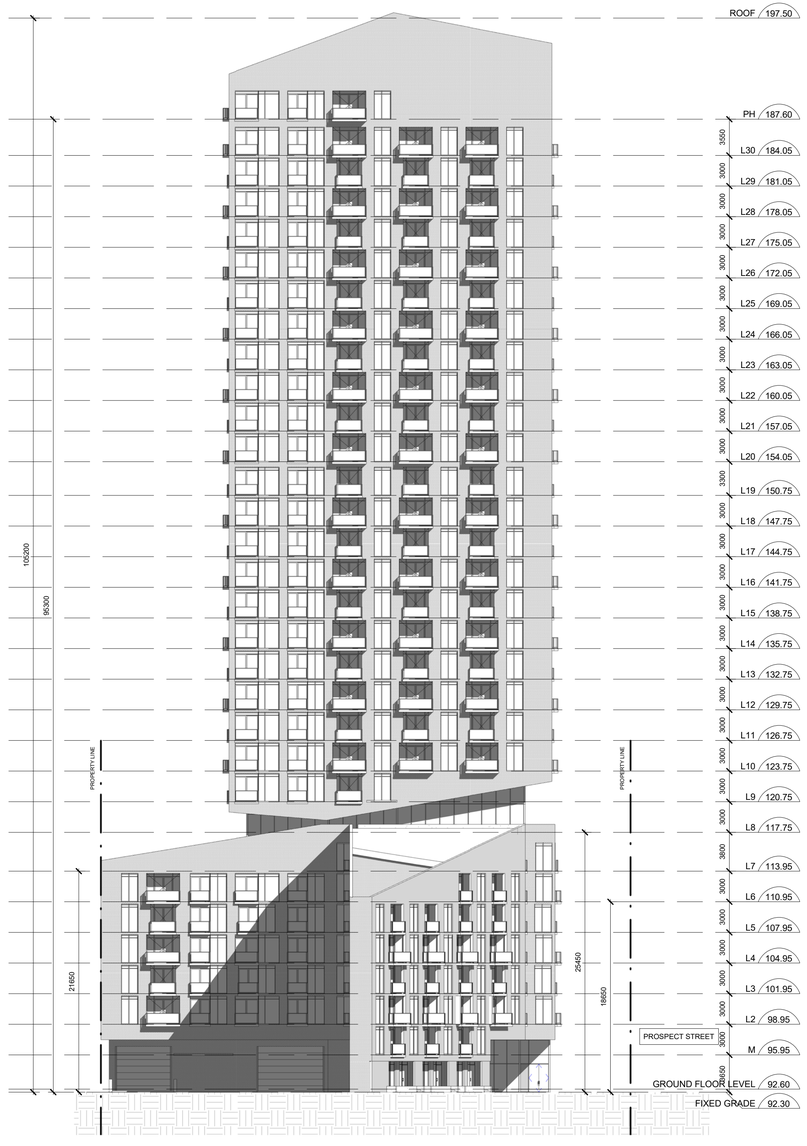
1 : 250

A400

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1 A401 **South East Elevation**
1 : 250



2 A401 **North East Elevation**
1 : 250

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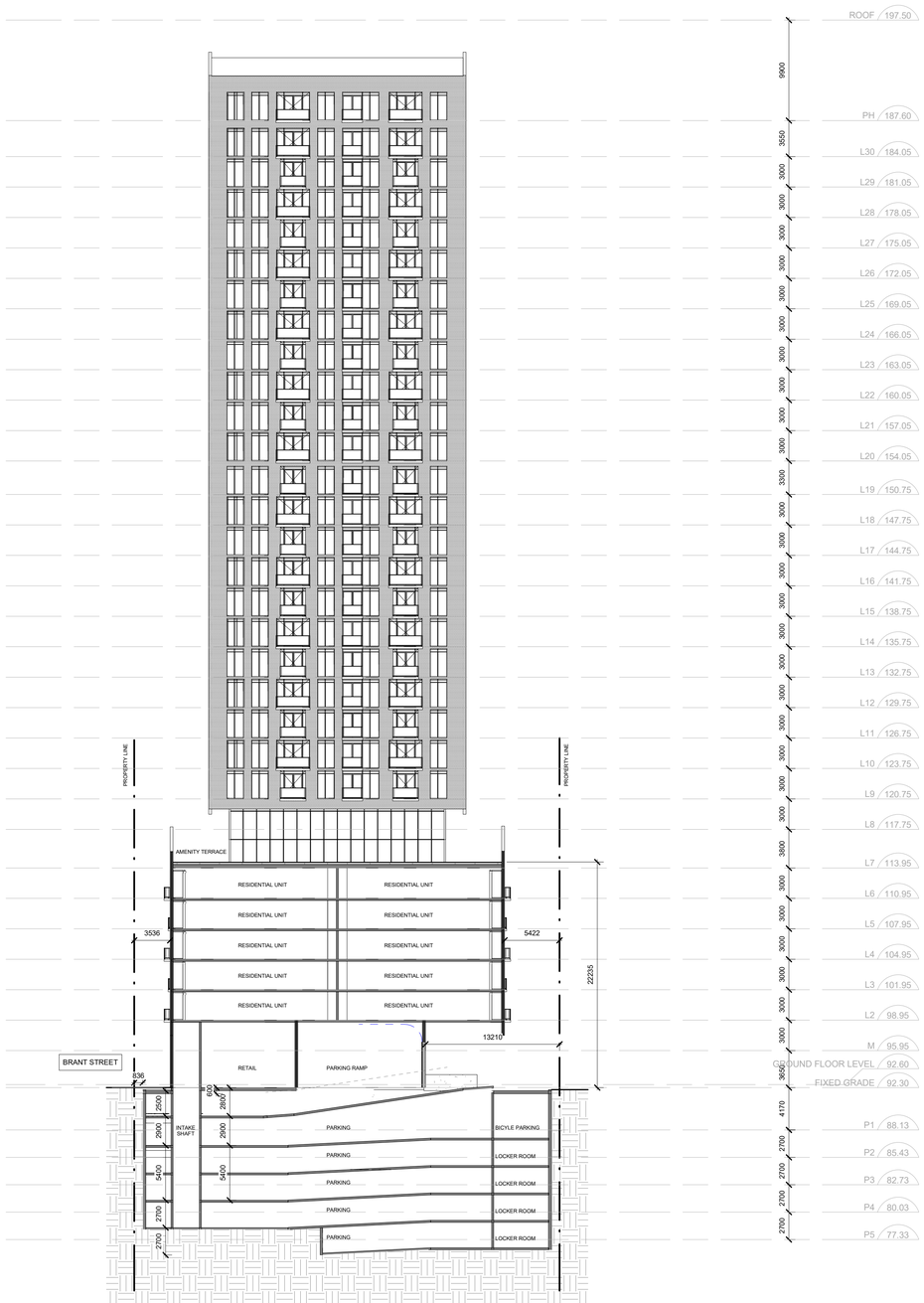
CAMARRO DEVELOPMENTS

BUILDING ELEVATIONS

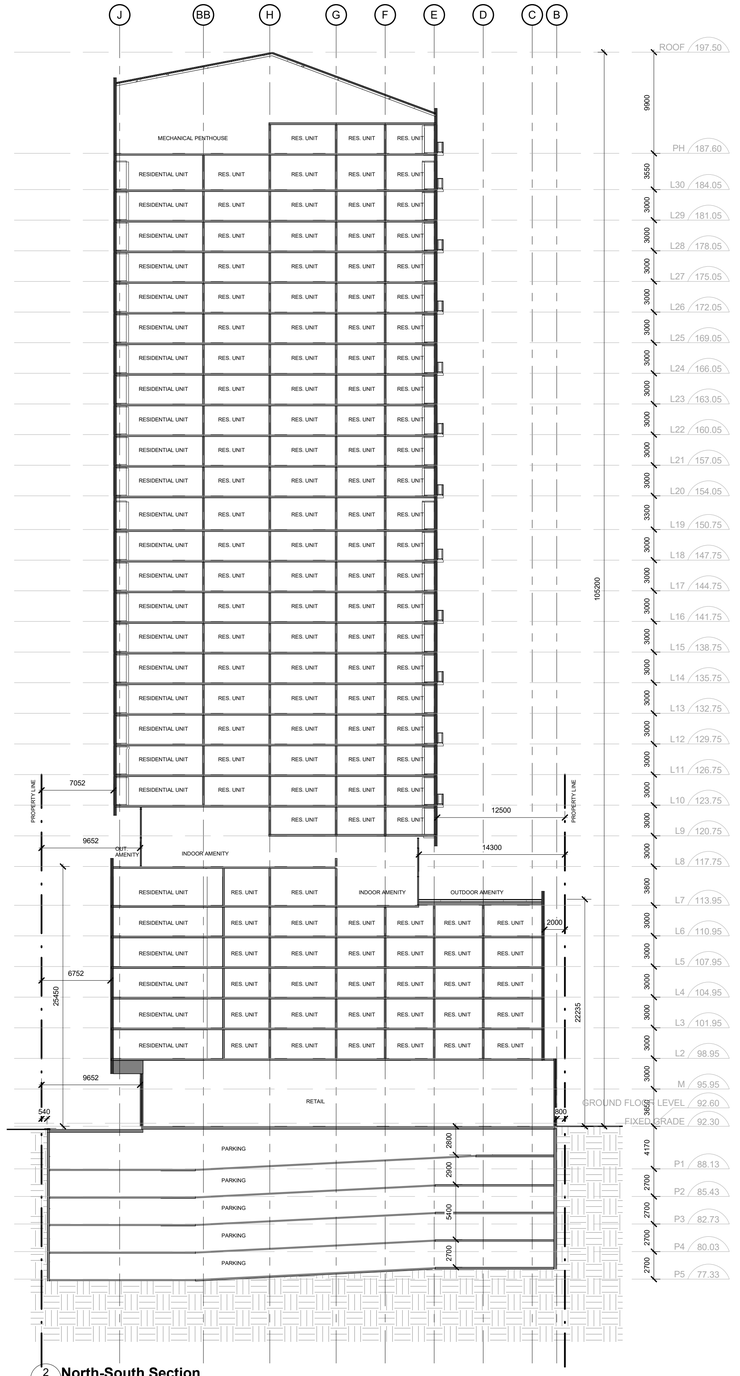
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A401

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1 A500 **East-West Section**
1 : 250



2 A500 **North-South Section**
1 : 250

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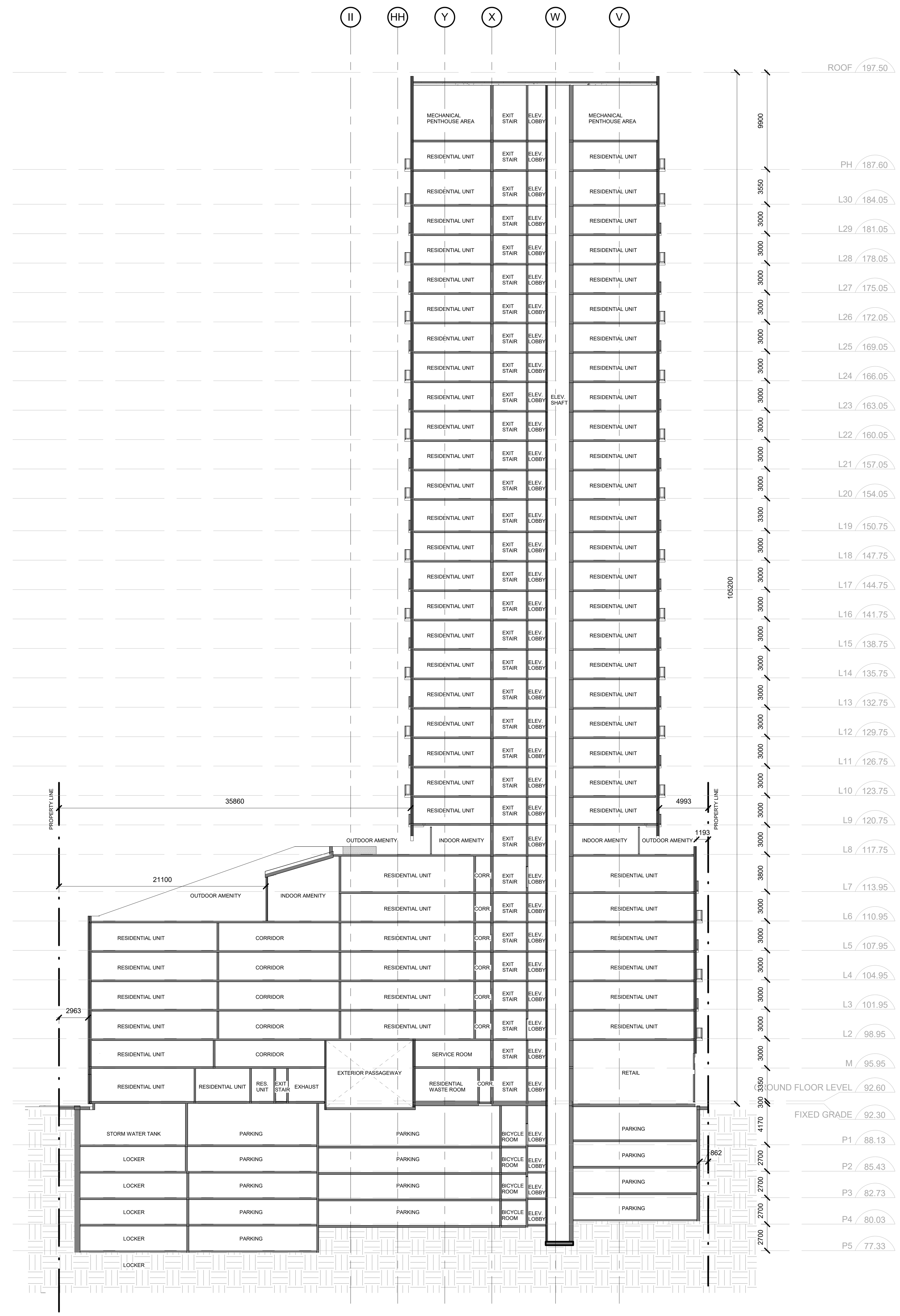
CAMARRO DEVELOPMENTS

BUILDING SECTIONS

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A500

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CAMARRO DEVELOPMENTS

BUILDING SECTION

1 : 250

A501

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APPENDIX C

Cycling Network

MAP 1
EXISTING NETWORK

BURLINGTON CYCLING MASTER PLAN

EXISTING FACILITIES

- Multi-Use Trail
- Multi-Use Path
- Painted Bike Lane
- Painted Bike Lane / Shared
- Signed Route
- Paved Shoulder

FEATURES AND BOUNDARIES

- Regional Road
- Railway
- Mobility Hub
- Waterbody
- Burlington

Note: existing network conditions are shown as of 2018

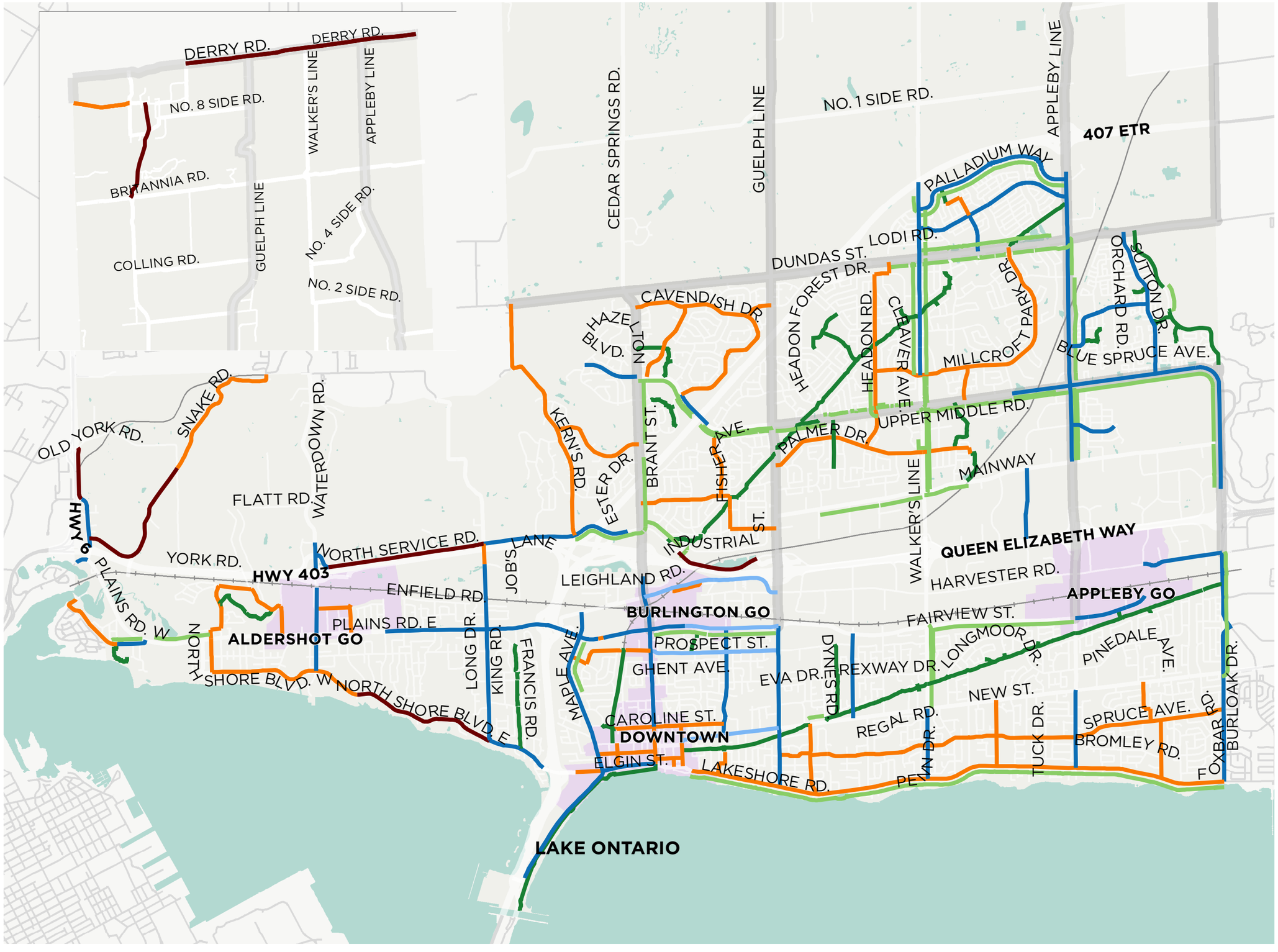
CITY OF Burlington

0 0.75 1.5 KILOMETRES

5 MIN BIKE RIDE

alta PLANNING + DESIGN

Data provided by the City of Burlington, Region of Halton, and Statistics Canada.
Map produced January 2020.



APPENDIX D

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

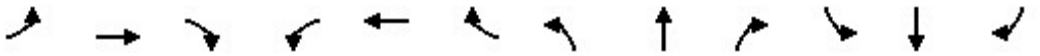
Signalized Intersections

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

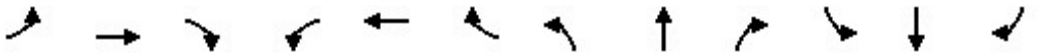
APPENDIX E

Detailed Capacity Analysis – 2022 Existing



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	79	0	0	124	8	5	1	0	15	0	6
Future Volume (vph)	0	79	0	0	124	8	5	1	0	15	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.992						0.959	
Flt Protected								0.960			0.966	
Satd. Flow (prot)	0	1883	0	0	1868	0	0	1808	0	0	1745	0
Flt Permitted								0.960			0.966	
Satd. Flow (perm)	0	1883	0	0	1868	0	0	1808	0	0	1745	0
Link Speed (k/h)		30			40			30			40	
Link Distance (m)		44.1			71.0			49.3			133.9	
Travel Time (s)		5.3			6.4			5.9			12.1	
Confl. Peds. (#/hr)	6		5	5		6	4					4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	86	0	0	135	9	5	1	0	16	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	144	0	0	6	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
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												
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)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.4%		ICU Level of Service A	
Analysis Period (min) 15			

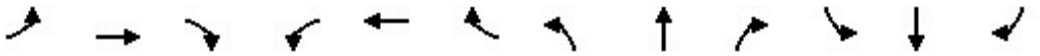


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	79	0	0	124	8	5	1	0	15	0	6
Future Volume (Veh/h)	0	79	0	0	124	8	5	1	0	15	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	86	0	0	135	9	5	1	0	16	0	7
Pedestrians		4						5			6	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		109										
pX, platoon unblocked												
vC, conflicting volume	150			91			242	241	91	232	236	150
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150			91			242	241	91	232	236	150
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	98	100	99
cM capacity (veh/h)	1429			1502			703	658	965	719	662	894

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	86	144	6	23
Volume Left	0	0	5	16
Volume Right	0	9	0	7
cSH	1429	1502	695	765
Volume to Capacity	0.00	0.00	0.01	0.03
Queue Length 95th (m)	0.0	0.0	0.2	0.7
Control Delay (s)	0.0	0.0	10.2	9.9
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	10.2	9.9
Approach LOS			B	A

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	19.4%	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)	31	9	15	51	7	72	24	726	38	82	818	80
Future Volume (vph)	31	9	15	51	7	72	24	726	38	82	818	80
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	15.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	60.0			40.0			10.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.98		0.99	1.00		0.99	1.00	
Frt		0.908			0.864			0.993			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1579	1483	0	1610	1469	0	1643	3158	0	1610	3135	0
Flt Permitted	0.701			0.740			0.267			0.322		
Satd. Flow (perm)	1158	1483	0	1240	1469	0	459	3158	0	540	3135	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			78			9			17	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		79.4			64.6			154.5			294.1	
Travel Time (s)		7.1			5.8			11.1			21.2	
Confl. Peds. (#/hr)	4		7	7		4	19		30	30		19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	7%	2%	0%	0%	0%	3%	3%	2%	3%	3%
Adj. Flow (vph)	34	10	16	55	8	78	26	789	41	89	889	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	26	0	55	86	0	26	830	0	89	976	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		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			Yes	
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	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	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

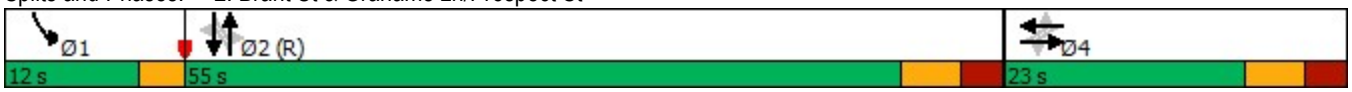


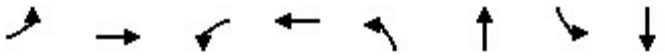
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		41.0	41.0		9.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	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	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	3.0	3.0		3.0	3.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	10.0	10.0		10.0	10.0		62.4	62.4		70.6	62.4	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.69	0.69		0.78	0.69	
v/c Ratio	0.27	0.15		0.40	0.37		0.08	0.38		0.18	0.45	
Control Delay	41.0	22.6		45.3	15.1		6.2	5.7		3.5	9.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.0	22.6		45.3	15.1		6.2	5.7		3.5	9.3	
LOS	D	C		D	B		A	A		A	A	
Approach Delay		33.1			26.9			5.7			8.8	
Approach LOS		C			C			A			A	
Queue Length 50th (m)	5.5	1.6		9.1	1.3		1.3	23.7		2.7	41.5	
Queue Length 95th (m)	13.8	8.5		19.6	13.6		3.9	33.5		6.9	66.6	
Internal Link Dist (m)		55.4			40.6			130.5			270.1	
Turn Bay Length (m)	30.0			20.0			15.0			20.0		
Base Capacity (vph)	205	276		220	325		318	2193		540	2180	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.17	0.09		0.25	0.26		0.08	0.38		0.16	0.45	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 43 (48%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 9.4		Intersection LOS: A	

Intersection Capacity Utilization 62.7% ICU Level of Service B
Analysis Period (min) 15

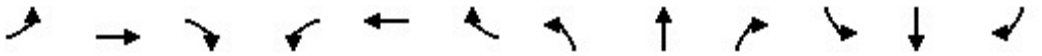
Splits and Phases: 2: Brant St & Grahams Ln/Prospect St



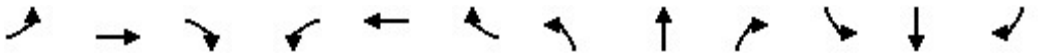


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	26	55	86	26	830	89	976
v/c Ratio	0.27	0.15	0.40	0.37	0.08	0.38	0.18	0.45
Control Delay	41.0	22.6	45.3	15.1	6.2	5.7	3.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	22.6	45.3	15.1	6.2	5.7	3.5	9.3
Queue Length 50th (m)	5.5	1.6	9.1	1.3	1.3	23.7	2.7	41.5
Queue Length 95th (m)	13.8	8.5	19.6	13.6	3.9	33.5	6.9	66.6
Internal Link Dist (m)		55.4		40.6		130.5		270.1
Turn Bay Length (m)	30.0		20.0		15.0		20.0	
Base Capacity (vph)	205	276	220	325	318	2193	540	2180
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.09	0.25	0.26	0.08	0.38	0.16	0.45

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	23	20	22	9	26	11	630	29	31	749	110
Future Volume (vph)	129	23	20	22	9	26	11	630	29	31	749	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		15.0	0.0		0.0	25.0		0.0	15.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00		0.99	1.00		0.98	0.99	
Frt			0.850		0.939			0.993			0.981	
Flt Protected		0.959			0.981		0.950			0.950		
Satd. Flow (prot)	0	1755	1484	0	1675	0	1534	3214	0	1825	3240	0
Flt Permitted		0.715			0.827		0.282			0.371		
Satd. Flow (perm)	0	1308	1460	0	1410	0	453	3214	0	700	3240	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		28			7			24	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		116.2			171.8			109.5			154.5	
Travel Time (s)		10.5			15.5			7.9			11.1	
Confl. Peds. (#/hr)			5	5			15		31	31		15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	10%	0%	4%	19%	13%	0%	0%	10%	9%
Adj. Flow (vph)	140	25	22	24	10	28	12	685	32	34	814	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	165	22	0	62	0	12	717	0	34	934	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			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)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
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	6.1	1.8		6.1	1.8		6.1	1.8	
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	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/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	
Recall Mode	None	None	None	None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		17.0	17.0		17.0		59.0	59.0		59.0	59.0	
Actuated g/C Ratio		0.19	0.19		0.19		0.66	0.66		0.66	0.66	
v/c Ratio		0.67	0.07		0.22		0.04	0.34		0.07	0.44	
Control Delay		46.4	2.7		19.3		8.0	8.1		4.3	4.4	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		46.4	2.7		19.3		8.0	8.1		4.3	4.4	
LOS		D	A		B		A	A		A	A	
Approach Delay		41.2			19.3			8.1			4.4	
Approach LOS		D			B			A			A	
Queue Length 50th (m)		26.8	0.0		5.0		0.7	25.1		1.2	16.2	
Queue Length 95th (m)		42.3	2.0		13.7		3.3	44.8		m1.9	13.9	
Internal Link Dist (m)		92.2			147.8			85.5			130.5	
Turn Bay Length (m)			15.0				25.0			15.0		
Base Capacity (vph)		494	581		550		297	2110		459	2133	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.33	0.04		0.11		0.04	0.34		0.07	0.44	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 9.8	Intersection LOS: A

Intersection Capacity Utilization 58.2% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 3: Brant St & Ghent Ave

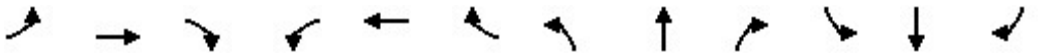




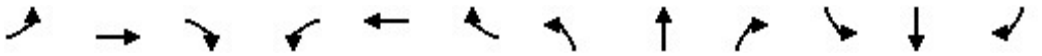
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	165	22	62	12	717	34	934
v/c Ratio	0.67	0.07	0.22	0.04	0.34	0.07	0.44
Control Delay	46.4	2.7	19.3	8.0	8.1	4.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.4	2.7	19.3	8.0	8.1	4.3	4.4
Queue Length 50th (m)	26.8	0.0	5.0	0.7	25.1	1.2	16.2
Queue Length 95th (m)	42.3	2.0	13.7	3.3	44.8	m1.9	13.9
Internal Link Dist (m)	92.2		147.8		85.5		130.5
Turn Bay Length (m)		15.0		25.0		15.0	
Base Capacity (vph)	494	581	550	297	2110	459	2133
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.04	0.11	0.04	0.34	0.07	0.44

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)	306	962	223	108	305	138	160	546	233	208	630	137
Future Volume (vph)	306	962	223	108	305	138	160	546	233	208	630	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		100.0	30.0		0.0	25.0		20.0	40.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	0.0			80.0			70.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	1.00			0.99		0.96	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1722	3614	1601	1807	3510	1570	1807	3510	1498	1789	3579	1420
Flt Permitted	0.444			0.140			0.293			0.257		
Satd. Flow (perm)	805	3614	1571	266	3510	1570	552	3510	1438	480	3579	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			242			193			192			153
Link Speed (k/h)		60			40			50			60	
Link Distance (m)		121.4			138.6			294.1			96.5	
Travel Time (s)		7.3			12.5			21.2			5.8	
Confl. Peds. (#/hr)			5	5			22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	1%	2%	1%	4%	4%	1%	4%	9%	2%	2%	15%
Adj. Flow (vph)	333	1046	242	117	332	150	174	593	253	226	685	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	333	1046	242	117	332	150	174	593	253	226	685	149
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)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	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	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	0.0
Detector 1 Size(m)	6.1	1.8	6.1	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	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	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	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	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	

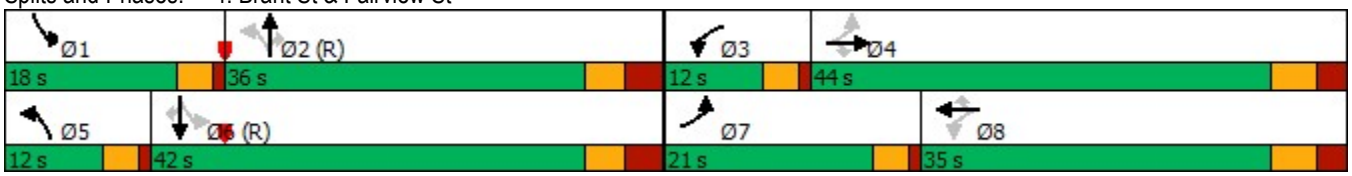


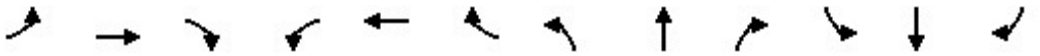
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	30.5	30.5
Total Split (s)	21.0	44.0	44.0	12.0	35.0	35.0	12.0	36.0	36.0	18.0	42.0	42.0
Total Split (%)	19.1%	40.0%	40.0%	10.9%	31.8%	31.8%	10.9%	32.7%	32.7%	16.4%	38.2%	38.2%
Maximum Green (s)	17.0	37.6	37.6	8.0	28.6	28.6	8.0	29.5	29.5	14.0	35.5	35.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	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	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	51.6	37.0	37.0	39.1	28.5	28.5	42.1	31.2	31.2	49.4	35.4	35.4
Actuated g/C Ratio	0.47	0.34	0.34	0.36	0.26	0.26	0.38	0.28	0.28	0.45	0.32	0.32
v/c Ratio	0.64	0.86	0.35	0.56	0.37	0.27	0.57	0.60	0.46	0.62	0.59	0.27
Control Delay	25.6	42.4	4.8	29.0	34.6	3.2	27.7	37.7	12.4	26.9	34.2	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	42.4	4.8	29.0	34.6	3.2	27.7	37.7	12.4	26.9	34.2	5.6
LOS	C	D	A	C	C	A	C	D	B	C	C	A
Approach Delay		33.3			25.6			29.7			28.6	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	42.5	105.2	0.0	12.9	30.0	0.0	23.3	61.7	10.5	31.3	67.6	0.0
Queue Length 95th (m)	68.0	135.0	16.1	25.2	43.5	7.6	35.9	77.6	32.8	46.2	83.3	13.1
Internal Link Dist (m)		97.4			114.6			270.1			72.5	
Turn Bay Length (m)	30.0		100.0	30.0			25.0		20.0	40.0		
Base Capacity (vph)	523	1249	701	212	927	557	308	1019	554	386	1195	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.84	0.35	0.55	0.36	0.27	0.56	0.58	0.46	0.59	0.57	0.27

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 30.2	Intersection LOS: C

Intersection Capacity Utilization 81.5% ICU Level of Service D
Analysis Period (min) 15

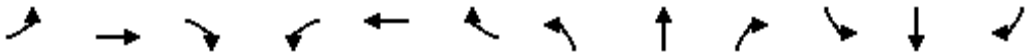
Splits and Phases: 4: Brant St & Fairview St





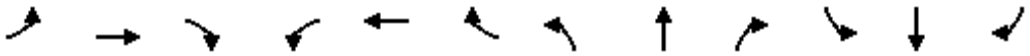
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	333	1046	242	117	332	150	174	593	253	226	685	149
v/c Ratio	0.64	0.86	0.35	0.56	0.37	0.27	0.57	0.60	0.46	0.62	0.59	0.27
Control Delay	25.6	42.4	4.8	29.0	34.6	3.2	27.7	37.7	12.4	26.9	34.2	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	42.4	4.8	29.0	34.6	3.2	27.7	37.7	12.4	26.9	34.2	5.6
Queue Length 50th (m)	42.5	105.2	0.0	12.9	30.0	0.0	23.3	61.7	10.5	31.3	67.6	0.0
Queue Length 95th (m)	68.0	135.0	16.1	25.2	43.5	7.6	35.9	77.6	32.8	46.2	83.3	13.1
Internal Link Dist (m)		97.4			114.6			270.1			72.5	
Turn Bay Length (m)	30.0		100.0	30.0			25.0		20.0	40.0		
Base Capacity (vph)	523	1249	701	212	927	557	308	1019	554	386	1195	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.84	0.35	0.55	0.36	0.27	0.56	0.58	0.46	0.59	0.57	0.27

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	137	2	0	189	13	8	1	1	16	0	6
Future Volume (vph)	9	137	2	0	189	13	8	1	1	16	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.991			0.988			0.961	
Flt Protected		0.997						0.961			0.966	
Satd. Flow (prot)	0	1874	0	0	1866	0	0	1788	0	0	1748	0
Flt Permitted		0.997						0.961			0.966	
Satd. Flow (perm)	0	1874	0	0	1866	0	0	1788	0	0	1748	0
Link Speed (k/h)		40			40			48			40	
Link Distance (m)		44.1			71.0			49.3			133.9	
Travel Time (s)		4.0			6.4			3.7			12.1	
Confl. Peds. (#/hr)	9		5	5		9	1					1
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)	10	149	2	0	205	14	9	1	1	17	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	161	0	0	219	0	0	11	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
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												
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
Sign Control		Free			Free			Stop			Stop	

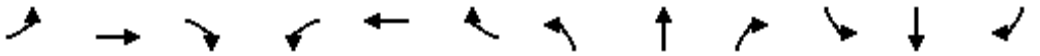
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.1%		ICU Level of Service A	
Analysis Period (min) 15			



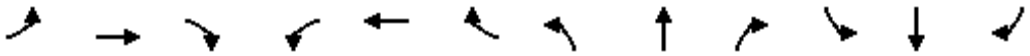
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	137	2	0	189	13	8	1	1	16	0	6
Future Volume (Veh/h)	9	137	2	0	189	13	8	1	1	16	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	149	2	0	205	14	9	1	1	17	0	7
Pedestrians		1						5			9	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		109										
pX, platoon unblocked												
vC, conflicting volume	228			156			395	403	155	392	397	222
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228			156			395	403	155	392	397	222
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	100	100	97	100	99
cM capacity (veh/h)	1328			1417			548	525	886	551	529	810

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	161	219	11	24
Volume Left	10	0	9	17
Volume Right	2	14	1	7
cSH	1328	1417	565	608
Volume to Capacity	0.01	0.00	0.02	0.04
Queue Length 95th (m)	0.2	0.0	0.5	0.9
Control Delay (s)	0.5	0.0	11.5	11.2
Lane LOS	A		B	B
Approach Delay (s)	0.5	0.0	11.5	11.2
Approach LOS			B	B

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	25.1%	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)	113	18	39	98	10	163	14	959	53	101	898	55
Future Volume (vph)	113	18	39	98	10	163	14	959	53	101	898	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	15.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	60.0			40.0			10.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.98	0.97		0.99	1.00		0.99	1.00	
Frt		0.898			0.859			0.992			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1579	1517	0	1643	1370	0	1428	3218	0	1610	3209	0
Flt Permitted	0.560			0.717			0.227			0.205		
Satd. Flow (perm)	921	1517	0	1215	1370	0	340	3218	0	345	3209	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			177			10			11	
Link Speed (k/h)		40			64			50			50	
Link Distance (m)		79.4			64.6			154.5			294.1	
Travel Time (s)		7.1			3.6			11.1			21.2	
Confl. Peds. (#/hr)	9		13	13		9	20		31	31		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	0%	0%	0%	6%	15%	1%	0%	2%	1%	4%
Adj. Flow (vph)	123	20	42	107	11	177	15	1042	58	110	976	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	62	0	107	188	0	15	1100	0	110	1036	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		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			Yes	
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	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	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		41.0	41.0		9.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	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	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	3.0	3.0		3.0	3.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	14.5	14.5		14.5	14.5		52.9	52.9		63.1	52.9	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.59	0.59		0.70	0.59	
v/c Ratio	0.84	0.22		0.55	0.51		0.07	0.58		0.32	0.55	
Control Delay	78.2	17.1		45.4	11.7		8.1	12.7		6.5	13.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.2		0.0	0.0	
Total Delay	78.2	17.1		45.4	11.7		8.1	12.9		6.5	13.6	
LOS	E	B		D	B		A	B		A	B	
Approach Delay		57.7			23.9			12.8			12.9	
Approach LOS		E			C			B			B	
Queue Length 50th (m)	20.4	2.9		16.8	1.6		1.6	81.6		5.0	57.7	
Queue Length 95th (m)	#48.0	13.4		33.2	19.4		m1.6	30.8		9.5	79.4	
Internal Link Dist (m)		55.4			40.6			130.5			270.1	
Turn Bay Length (m)	30.0			20.0			15.0			20.0		
Base Capacity (vph)	163	304		216	389		200	1896		372	1891	
Starvation Cap Reductn	0	0		0	0		0	201		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	0.75	0.20		0.50	0.48		0.07	0.65		0.30	0.55	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 85 (94%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 17.1		Intersection LOS: B	

Intersection Capacity Utilization 79.4% ICU Level of Service D

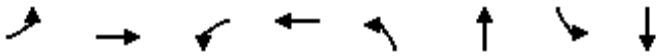
Analysis Period (min) 15

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

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

Splits and Phases: 2: Brant St & Grahams Ln/Prospect St



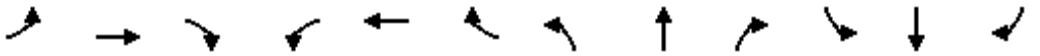


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	62	107	188	15	1100	110	1036
v/c Ratio	0.84	0.22	0.55	0.51	0.07	0.58	0.32	0.55
Control Delay	78.2	17.1	45.4	11.7	8.1	12.7	6.5	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	78.2	17.1	45.4	11.7	8.1	12.9	6.5	13.6
Queue Length 50th (m)	20.4	2.9	16.8	1.6	1.6	81.6	5.0	57.7
Queue Length 95th (m)	#48.0	13.4	33.2	19.4	m1.6	30.8	9.5	79.4
Internal Link Dist (m)		55.4		40.6		130.5		270.1
Turn Bay Length (m)	30.0		20.0		15.0		20.0	
Base Capacity (vph)	163	304	216	389	200	1896	372	1891
Starvation Cap Reductn	0	0	0	0	0	201	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	0.75	0.20	0.50	0.48	0.07	0.65	0.30	0.55

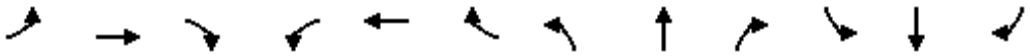
Intersection Summary

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)	139	25	14	25	53	39	11	850	22	33	800	178
Future Volume (vph)	139	25	14	25	53	39	11	850	22	33	800	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		15.0	0.0		0.0	25.0		0.0	15.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		0.99		0.99	1.00		0.99	0.99	
Frt			0.850		0.955			0.996			0.973	
Flt Protected		0.959			0.989		0.950			0.950		
Satd. Flow (prot)	0	1743	1512	0	1772	0	1825	3431	0	1659	3318	0
Flt Permitted		0.700			0.893		0.234			0.274		
Satd. Flow (perm)	0	1270	1481	0	1598	0	447	3431	0	476	3318	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		32			4			40	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		116.2			171.8			109.5			154.5	
Travel Time (s)		10.5			15.5			7.9			11.1	
Confl. Peds. (#/hr)	3		10	10		3	20		15	15		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	4%	8%	0%	2%	3%	0%	6%	0%	10%	6%	6%
Adj. Flow (vph)	151	27	15	27	58	42	12	924	24	36	870	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	178	15	0	127	0	12	948	0	36	1063	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
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	6.1	1.8		6.1	1.8		6.1	1.8	
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	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/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	
Recall Mode	None	None	None	None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		18.3	18.3		18.3		57.7	57.7		57.7	57.7	
Actuated g/C Ratio		0.20	0.20		0.20		0.64	0.64		0.64	0.64	
v/c Ratio		0.69	0.04		0.36		0.04	0.43		0.12	0.50	
Control Delay		46.1	0.2		24.0		8.8	9.7		7.2	7.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.1	
Total Delay		46.1	0.2		24.0		8.8	9.7		7.2	7.0	
LOS		D	A		C		A	A		A	A	
Approach Delay		42.5			24.0			9.7			7.0	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		28.8	0.0		14.0		0.7	37.9		2.0	33.3	
Queue Length 95th (m)		44.5	0.3		25.9		3.5	65.6		m3.4	32.4	
Internal Link Dist (m)		92.2			147.8			85.5			130.5	
Turn Bay Length (m)			15.0				25.0			15.0		
Base Capacity (vph)		479	589		623		286	2199		304	2140	
Starvation Cap Reductn		0	0		0		0	0		0	146	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.37	0.03		0.20		0.04	0.43		0.12	0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 11.9		Intersection LOS: B	

Intersection Capacity Utilization 66.2% ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 3: Brant St & Ghent Ave

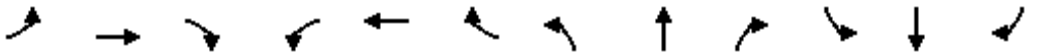




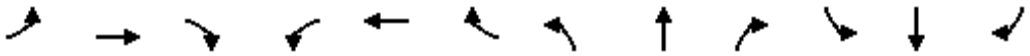
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	178	15	127	12	948	36	1063
v/c Ratio	0.69	0.04	0.36	0.04	0.43	0.12	0.50
Control Delay	46.1	0.2	24.0	8.8	9.7	7.2	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	46.1	0.2	24.0	8.8	9.7	7.2	7.0
Queue Length 50th (m)	28.8	0.0	14.0	0.7	37.9	2.0	33.3
Queue Length 95th (m)	44.5	0.3	25.9	3.5	65.6	m3.4	32.4
Internal Link Dist (m)	92.2		147.8		85.5		130.5
Turn Bay Length (m)		15.0		25.0		15.0	
Base Capacity (vph)	479	589	623	286	2199	304	2140
Starvation Cap Reductn	0	0	0	0	0	0	146
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.03	0.20	0.04	0.43	0.12	0.53

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)	193	709	239	182	1319	398	293	708	166	212	575	393
Future Volume (vph)	193	709	239	182	1319	398	293	708	166	212	575	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		100.0	30.0		0.0	25.0		20.0	40.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	0.0			80.0			70.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97	1.00		0.98	0.99		0.92	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3579	1601	1738	3614	1617	1789	3614	1633	1789	3579	1570
Flt Permitted	0.102			0.189			0.202			0.150		
Satd. Flow (perm)	194	3579	1558	345	3614	1590	378	3614	1505	279	3579	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			260			293			140			193
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		121.4			138.6			294.1			96.5	
Travel Time (s)		7.3			8.3			21.2			5.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	2%	2%	5%	1%	1%	2%	1%	0%	2%	2%	4%
Adj. Flow (vph)	210	771	260	198	1434	433	318	770	180	230	625	427
Shared Lane Traffic (%)												
Lane Group Flow (vph)	210	771	260	198	1434	433	318	770	180	230	625	427
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	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	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	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	0.0
Detector 1 Size(m)	6.1	1.8	6.1	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	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	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	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	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	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	30.5	30.5
Total Split (s)	13.0	42.0	42.0	20.0	49.0	49.0	22.0	36.0	36.0	22.0	36.0	36.0
Total Split (%)	10.8%	35.0%	35.0%	16.7%	40.8%	40.8%	18.3%	30.0%	30.0%	18.3%	30.0%	30.0%
Maximum Green (s)	9.0	35.6	35.6	16.0	42.6	42.6	18.0	29.5	29.5	18.0	29.5	29.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	2.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?		Yes	Yes	Yes			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	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	51.6	39.4	39.4	56.9	46.6	42.6	51.1	31.5	31.5	46.8	29.2	29.2
Actuated g/C Ratio	0.43	0.33	0.33	0.47	0.39	0.36	0.43	0.26	0.26	0.39	0.24	0.24
v/c Ratio	0.97	0.66	0.38	0.63	1.02	0.58	0.87	0.81	0.36	0.77	0.72	0.83
Control Delay	85.6	38.5	5.5	27.4	66.3	12.9	49.1	49.8	12.4	42.3	47.0	38.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.6	38.5	5.5	27.4	66.3	12.9	49.1	49.8	12.4	42.3	47.0	38.3
LOS	F	D	A	C	E	B	D	D	B	D	D	D
Approach Delay		39.5			51.4			44.3			43.3	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	~37.1	82.7	0.0	26.4	~188.8	23.9	49.0	89.6	7.2	33.4	71.0	54.8
Queue Length 95th (m)	#87.5	107.6	18.7	41.7	#231.1	55.9	#95.7	#122.2	26.4	58.9	91.4	#107.0
Internal Link Dist (m)		97.4			114.6			270.1			72.5	
Turn Bay Length (m)	30.0		100.0	30.0			25.0		20.0	40.0		
Base Capacity (vph)	216	1175	686	354	1403	753	372	947	497	341	879	517
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.66	0.38	0.56	1.02	0.58	0.85	0.81	0.36	0.67	0.71	0.83

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 45.6	Intersection LOS: D

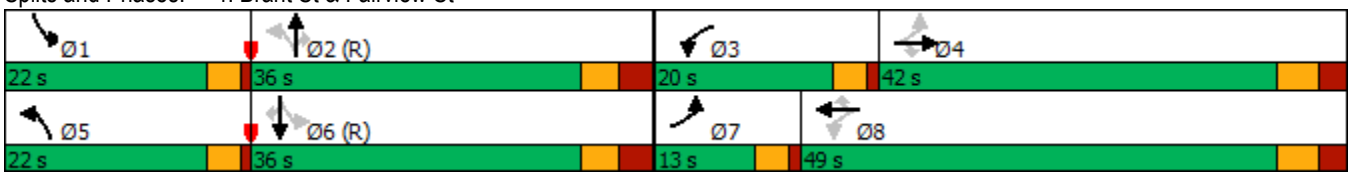
Intersection Capacity Utilization 98.8% ICU Level of Service F

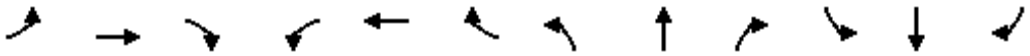
Analysis Period (min) 15

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

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

Splits and Phases: 4: Brant St & Fairview St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	771	260	198	1434	433	318	770	180	230	625	427
v/c Ratio	0.97	0.66	0.38	0.63	1.02	0.58	0.87	0.81	0.36	0.77	0.72	0.83
Control Delay	85.6	38.5	5.5	27.4	66.3	12.9	49.1	49.8	12.4	42.3	47.0	38.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.6	38.5	5.5	27.4	66.3	12.9	49.1	49.8	12.4	42.3	47.0	38.3
Queue Length 50th (m)	~37.1	82.7	0.0	26.4	~188.8	23.9	49.0	89.6	7.2	33.4	71.0	54.8
Queue Length 95th (m)	#87.5	107.6	18.7	41.7	#231.1	55.9	#95.7	#122.2	26.4	58.9	91.4	#107.0
Internal Link Dist (m)		97.4			114.6			270.1			72.5	
Turn Bay Length (m)	30.0		100.0	30.0			25.0		20.0	40.0		
Base Capacity (vph)	216	1175	686	354	1403	753	372	947	497	341	879	517
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.66	0.38	0.56	1.02	0.58	0.85	0.81	0.36	0.67	0.71	0.83

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 F

Background Trip Assignment



Traffic and Parking Study

2095 Prospect Street
City of Burlington

Welwyn Interests Inc.

GHD | 6705 Millcreek Drive Mississauga Ontario L5N 5M4 Canada

11148854 | 800 | Report No 1 | December 2017

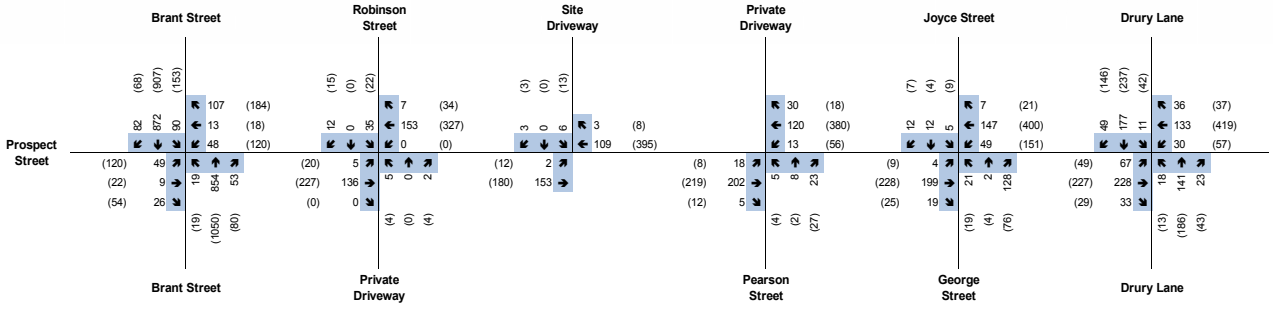


Figure 4 2023 Future Background Traffic Volumes

5. Site Generated Traffic

5.1 Modal Split

As a conservative measure no transit reduction was applied to the estimated site trips in the study analysis.

5.2 Site Trip Generation

Trip generation during the weekday peak hours for the proposed residential development was estimated using the average rates from the Institute of Transportation Engineer's (ITE) 9th Edition Land Use Codes (LUC) #230 for condominium dwellings, as presented in Table 1. The results of the average rates were more conservative than the fitted curve equations.

Table 1 Site Trip Generation

Land Use Code	Units	Parameters	Peak Hour Trip Generation					
			Weekday AM			Weekday PM		
			In	Out	Total	In	Out	Total
Condominium (LUC 230)	42 Units	Trip Rate	0.08	0.52	0.62	0.48	0.24	0.71
		Trip Rate	17%	83%	-	67%	33%	-
		Gross Trips	4	22	26	20	10	30

The subject development is estimated to generate a total of 26 two-way trips during the AM peak hour consisting of 4 inbound and 26 outbound trips and a total of 30 two-way trips during the PM peak hour consisting of 20 inbound and 10 outbound trips.

5.3 Site Trip Distribution and Assignment

The distribution and assignment for the site trips was derived from existing turning movement proportions taken from the intersection turning movement counts at the existing study area intersections.

The estimated site trips generated by the proposed development as assigned to the nearby road network for the weekday AM and PM peak hours are shown in Figure 5.

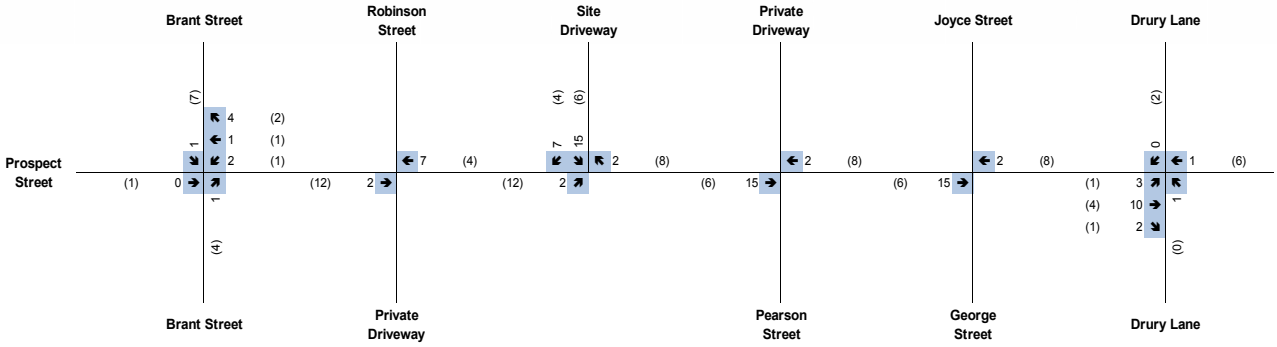


Figure 5 Estimated Site Trips

6. Future Total Traffic

6.1 Future Total Traffic

The future total traffic conditions for the peak study hours in the 2023 planning horizon was derived by combining the projected future background traffic with the corresponding estimate of the additional site generated traffic.

Figure 6 summarize the future total traffic volumes for the 2023 planning horizons, respectively, during the weekday AM and PM peak hours.

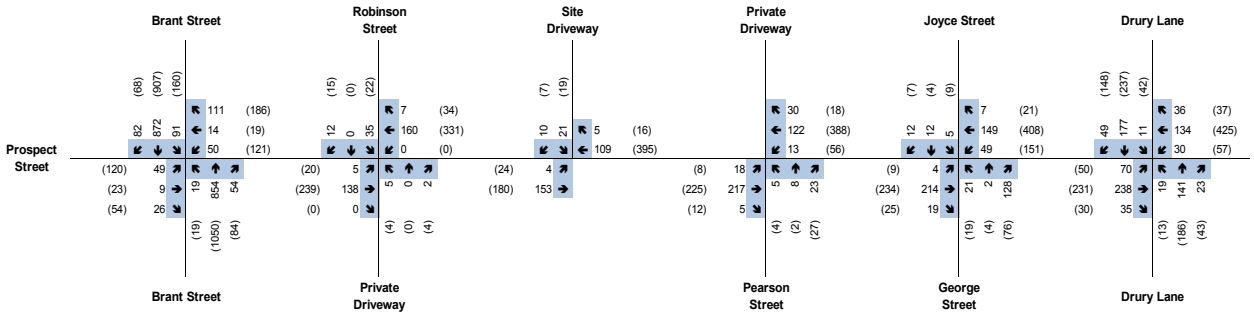


Figure 6 2023 Total Traffic Volumes

6.2 Intersection Capacity Analysis

The capacity analysis identifies how well the intersections are operating and how they are expected to operate in the future. The analysis contained within this report utilized the Highway Capacity Manual (HCM) 2000 techniques within the Synchro Version 8 Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement. Queuing characteristics are reported as the predicted 95th percentile queue for each turning movement.

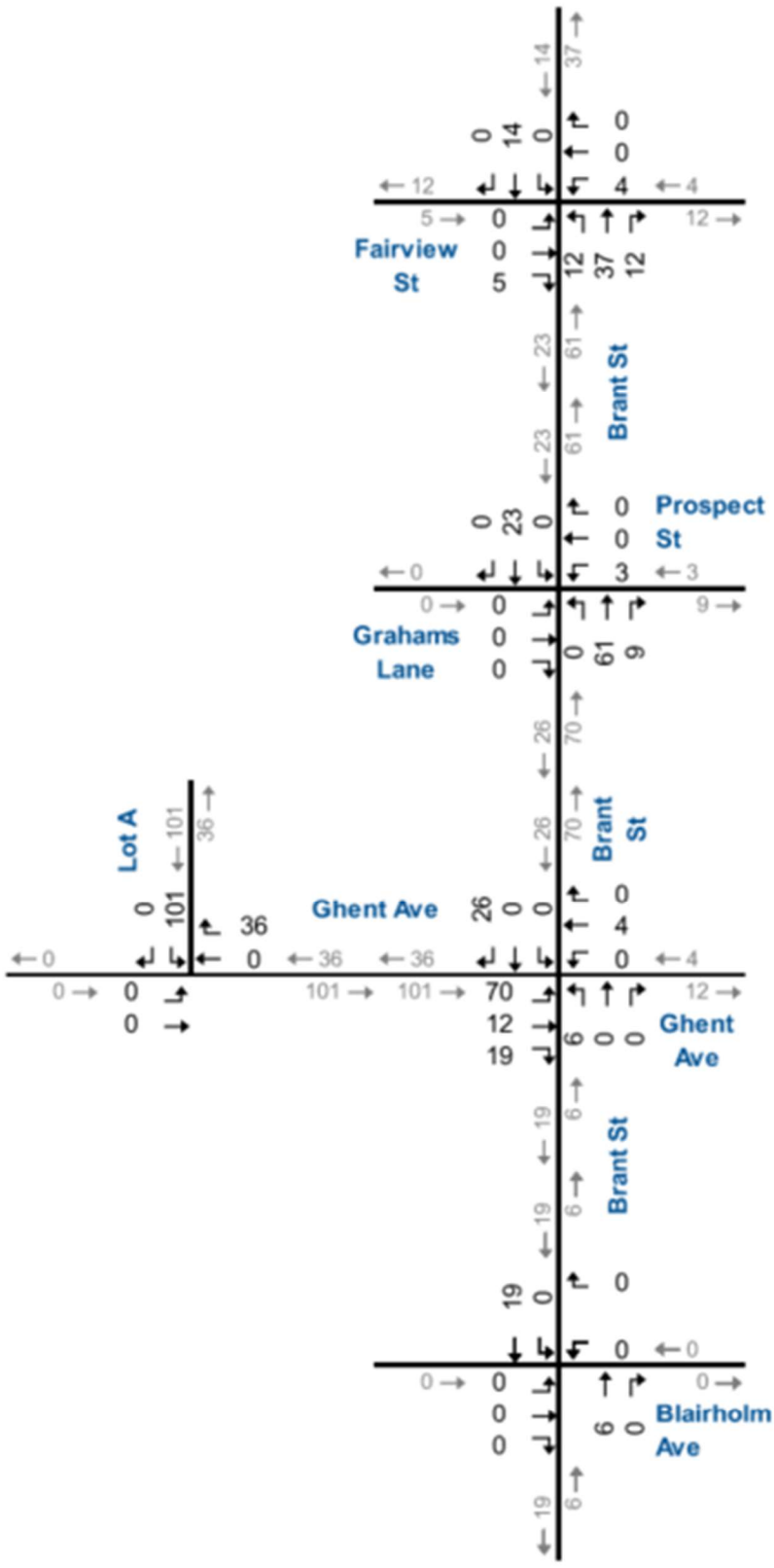
In accordance with the City's and Region's Traffic Impact Study Guidelines, the analysis includes identification of all intersections and for all movements; v/c ratios, LOS indicators and

Brant Street and Ghent Avenue, Burlington, ON Transportation Impact Assessment

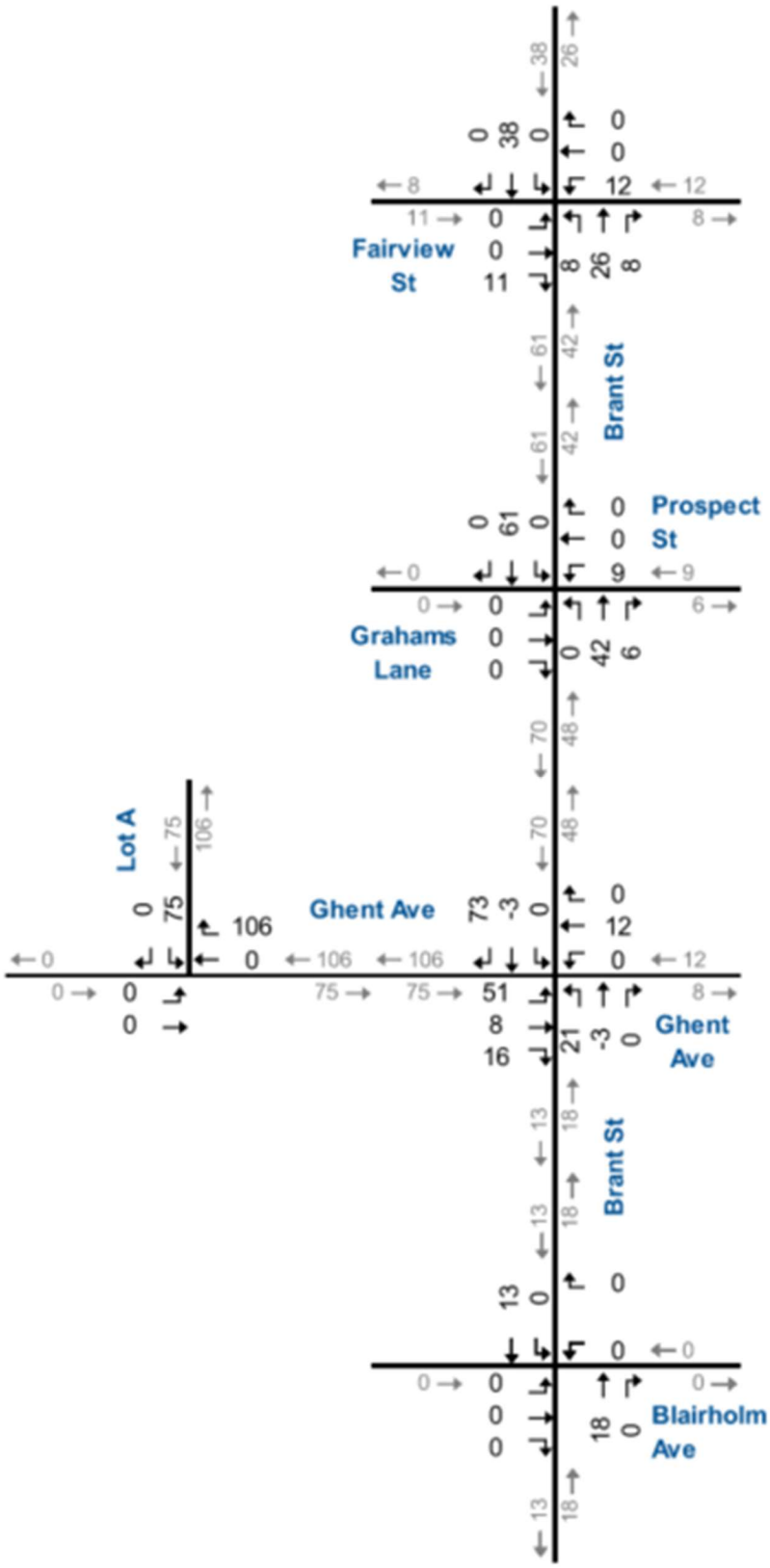
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May 2021
200403

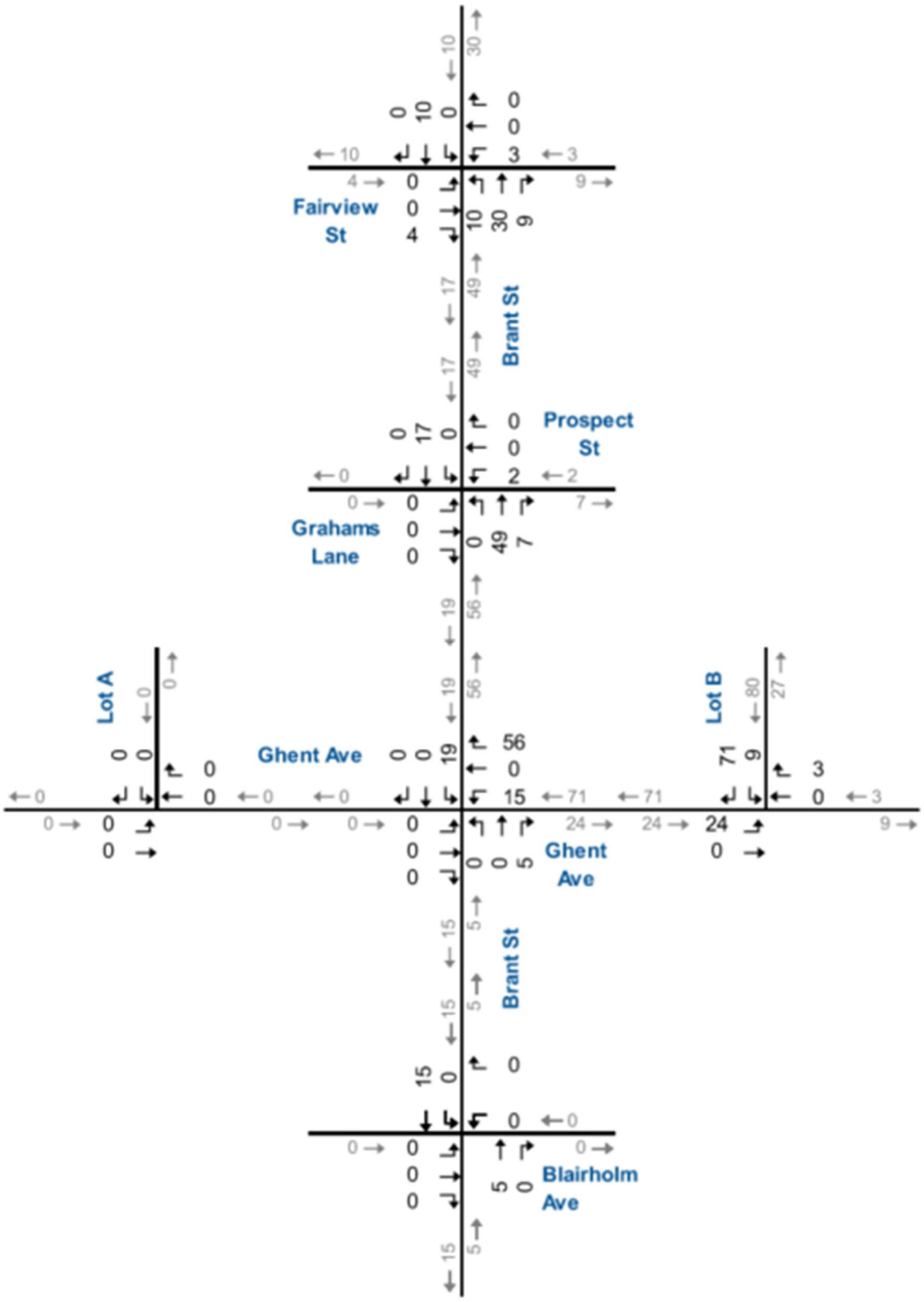
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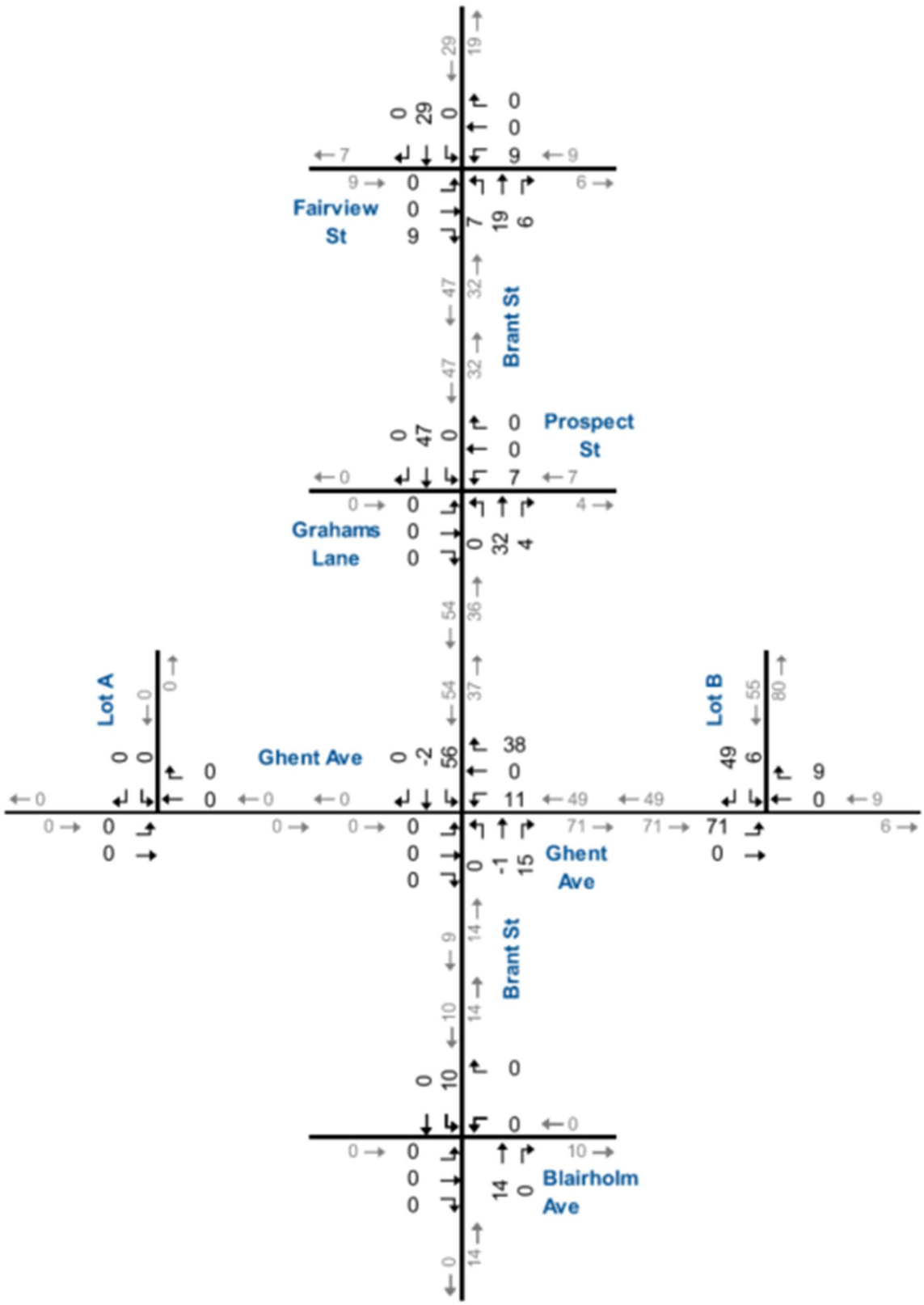
Site Generated Traffic
Phase 1 – AM Peak Hour



Site Generated Traffic
Phase 1 – PM Peak Hour

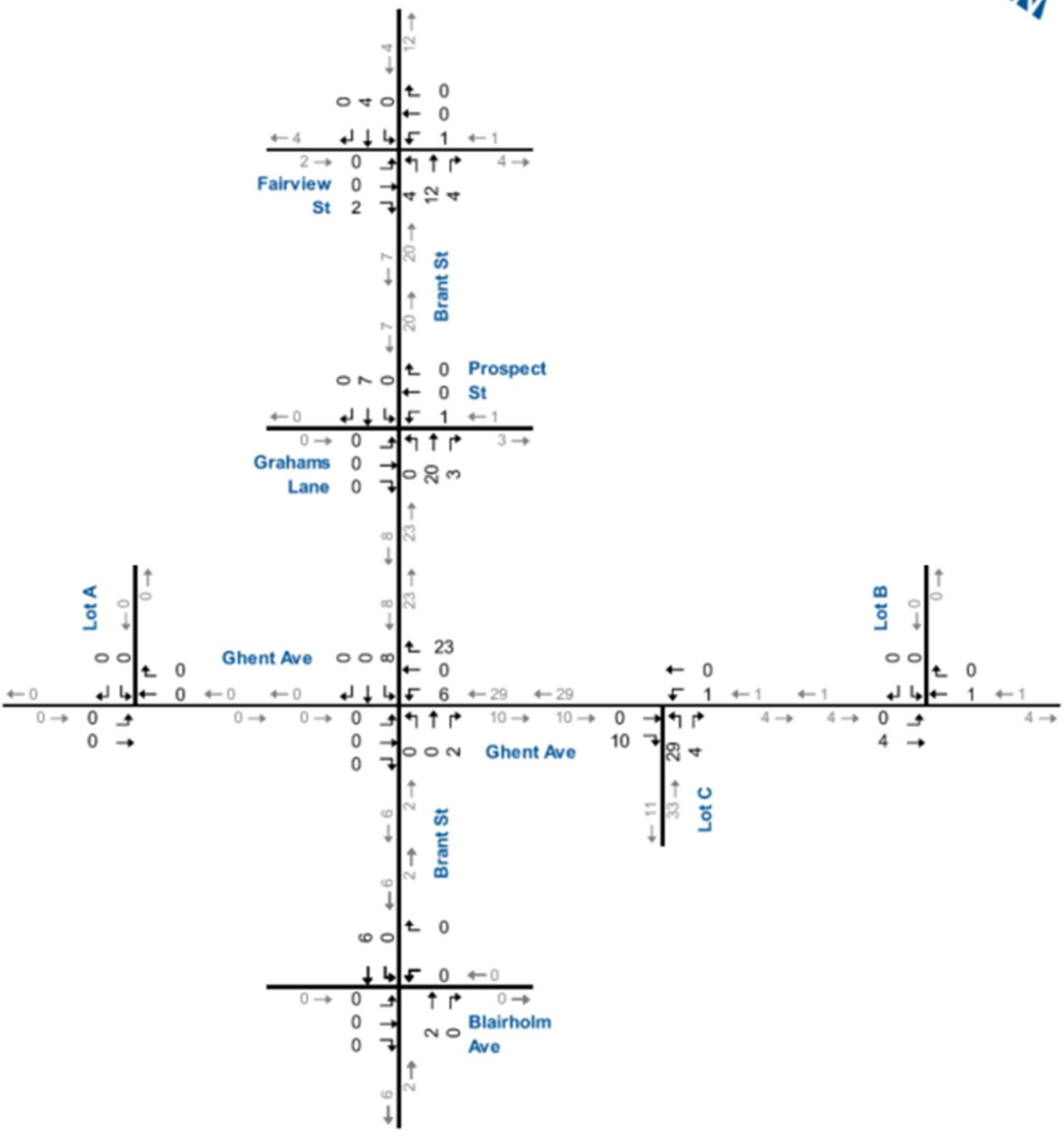


Site Generated Traffic
Phase 2 – AM Peak Hour

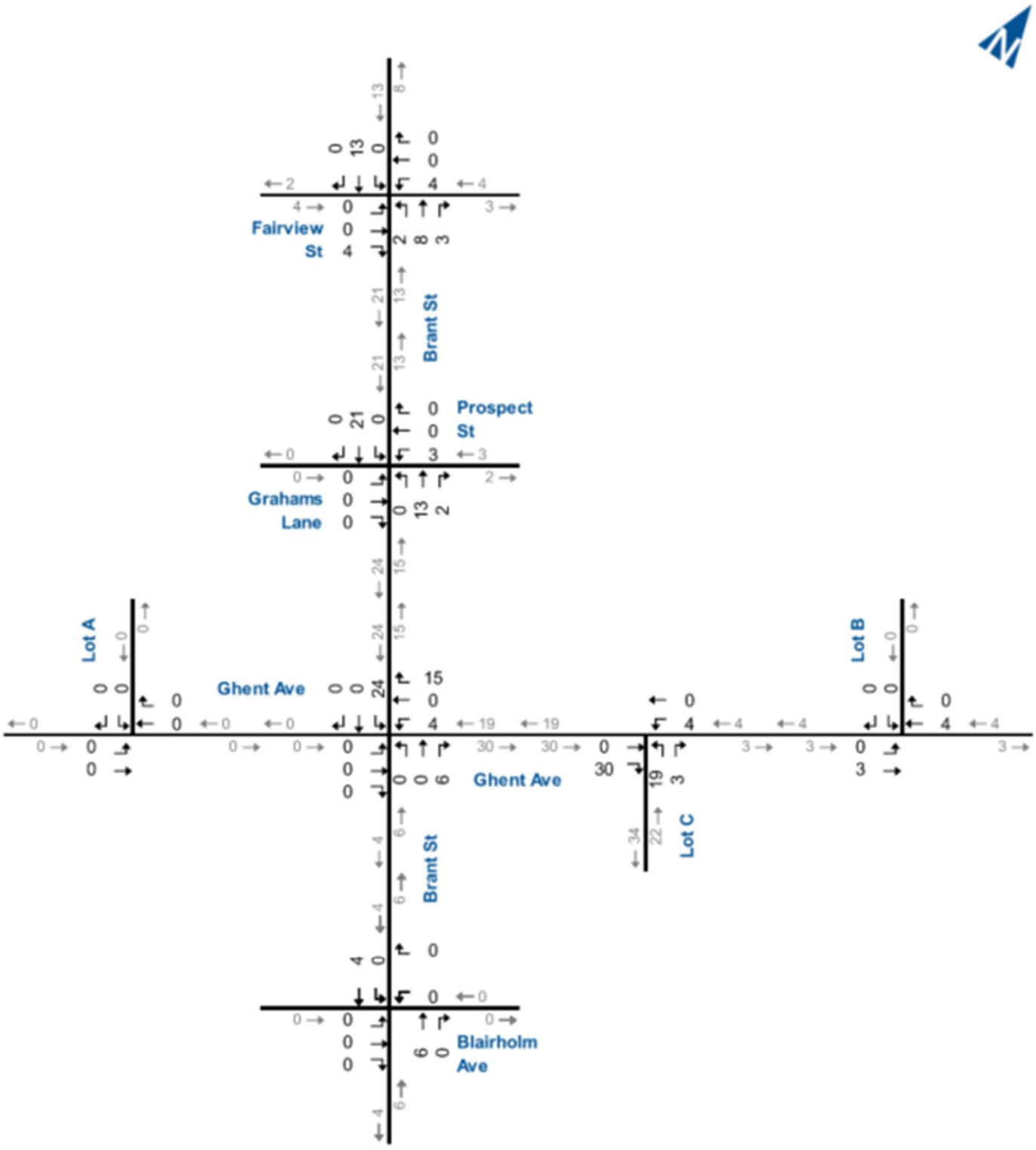


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Site Generated Traffic
Phase 2 – PM Peak Hour



Site Generated Traffic
Phase 3 – AM Peak Hour



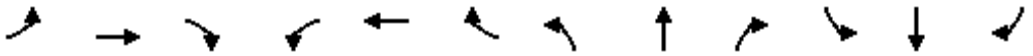
Site Generated Traffic
Phase 3 – PM Peak Hour

Brant Street & Ghent Avenue TIA
200403

Figure 3.7B

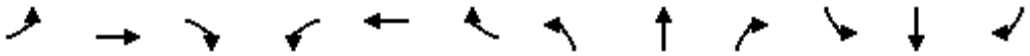
APPENDIX G

Detailed Capacity Analysis – 2027 Future Background



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	100	0	0	137	8	5	1	0	15	0	6
Future Volume (vph)	0	100	0	0	137	8	5	1	0	15	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.992						0.959	
Flt Protected								0.960			0.966	
Satd. Flow (prot)	0	1883	0	0	1868	0	0	1808	0	0	1745	0
Flt Permitted								0.960			0.966	
Satd. Flow (perm)	0	1883	0	0	1868	0	0	1808	0	0	1745	0
Link Speed (k/h)		30			40			30			40	
Link Distance (m)		44.1			71.0			49.3			133.9	
Travel Time (s)		5.3			6.4			5.9			12.1	
Confl. Peds. (#/hr)	6		5	5		6	4					4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	109	0	0	149	9	5	1	0	16	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	109	0	0	158	0	0	6	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
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												
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)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

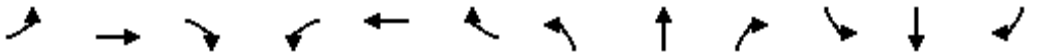
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	100	0	0	137	8	5	1	0	15	0	6
Future Volume (Veh/h)	0	100	0	0	137	8	5	1	0	15	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	109	0	0	149	9	5	1	0	16	0	7
Pedestrians		4						5			6	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		109										
pX, platoon unblocked												
vC, conflicting volume	164			114			278	278	114	269	274	164
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	164			114			278	278	114	269	274	164
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	98	100	99
cM capacity (veh/h)	1412			1473			665	628	937	680	631	879

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	109	158	6	23
Volume Left	0	0	5	16
Volume Right	0	9	0	7
cSH	1412	1473	659	730
Volume to Capacity	0.00	0.00	0.01	0.03
Queue Length 95th (m)	0.0	0.0	0.2	0.7
Control Delay (s)	0.0	0.0	10.5	10.1
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	10.5	10.1
Approach LOS			B	B

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	20.0%	ICU Level of Service	A	
Analysis Period (min)	15			



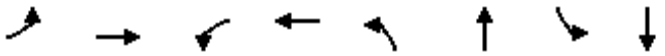
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	9	15	59	8	76	24	894	58	83	917	80
Future Volume (vph)	31	9	15	59	8	76	24	894	58	83	917	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	15.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	60.0			40.0			10.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.98		1.00	1.00		0.99	1.00	
Frt		0.908			0.865			0.991			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1579	1483	0	1610	1470	0	1643	3149	0	1610	3140	0
Flt Permitted	0.697			0.740			0.228			0.244		
Satd. Flow (perm)	1152	1483	0	1240	1470	0	392	3149	0	410	3140	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			83			11			15	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		79.4			64.6			154.5			294.1	
Travel Time (s)		7.1			5.8			11.1			21.2	
Confl. Peds. (#/hr)	4		7	7		4	19		30	30		19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	7%	2%	0%	0%	0%	3%	3%	2%	3%	3%
Adj. Flow (vph)	34	10	16	64	9	83	26	972	63	90	997	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	26	0	64	92	0	26	1035	0	90	1084	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		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			Yes	
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	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	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		41.0	41.0		9.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	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	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	3.0	3.0		3.0	3.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	10.7	10.7		10.7	10.7		61.7	61.7		69.9	61.7	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.69	0.69		0.78	0.69	
v/c Ratio	0.25	0.14		0.44	0.37		0.10	0.48		0.22	0.50	
Control Delay	39.2	21.7		45.3	14.3		8.3	7.7		4.3	10.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.2	21.7		45.3	14.3		8.3	7.7		4.3	10.6	
LOS	D	C		D	B		A	A		A	B	
Approach Delay		31.6			27.0			7.8			10.1	
Approach LOS		C			C			A			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 43 (48%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 10.7		Intersection LOS: B	
Intersection Capacity Utilization 66.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Brant St & Grahams Ln/Prospect St

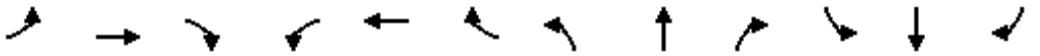




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	26	64	92	26	1035	90	1084
v/c Ratio	0.25	0.14	0.44	0.37	0.10	0.48	0.22	0.50
Control Delay	39.2	21.7	45.3	14.3	8.3	7.7	4.3	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	21.7	45.3	14.3	8.3	7.7	4.3	10.6
Queue Length 50th (m)	5.5	1.6	10.6	1.4	1.3	35.1	2.8	50.0
Queue Length 95th (m)	13.5	8.3	21.4	13.9	m4.5	58.8	7.8	82.8
Internal Link Dist (m)		55.4		40.6		130.5		270.1
Turn Bay Length (m)	30.0		20.0		15.0		20.0	
Base Capacity (vph)	204	276	220	329	268	2161	445	2156
Starvation Cap Reductn	0	0	0	0	0	85	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.09	0.29	0.28	0.10	0.50	0.20	0.50

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)	199	35	39	43	13	105	17	664	36	58	790	136
Future Volume (vph)	199	35	39	43	13	105	17	664	36	58	790	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		15.0	0.0		0.0	25.0		0.0	15.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00		1.00	1.00		0.98	0.99	
Frt			0.850		0.912			0.992			0.978	
Flt Protected		0.959			0.987		0.950			0.950		
Satd. Flow (prot)	0	1755	1484	0	1642	0	1534	3211	0	1825	3228	0
Flt Permitted		0.641			0.804		0.234			0.334		
Satd. Flow (perm)	0	1173	1460	0	1337	0	376	3211	0	631	3228	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		114			8			29	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		116.2			171.8			109.5			154.5	
Travel Time (s)		10.5			15.5			7.9			11.1	
Confl. Peds. (#/hr)			5	5			15		31	31		15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	10%	0%	4%	19%	13%	0%	0%	10%	9%
Adj. Flow (vph)	216	38	42	47	14	114	18	722	39	63	859	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	254	42	0	175	0	18	761	0	63	1007	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			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)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
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	6.1	1.8		6.1	1.8		6.1	1.8	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/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	
Recall Mode	None	None	None	None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		24.8	24.8		24.8		51.2	51.2		51.2	51.2	
Actuated g/C Ratio		0.28	0.28		0.28		0.57	0.57		0.57	0.57	
v/c Ratio		0.79	0.10		0.39		0.08	0.42		0.18	0.54	
Control Delay		46.4	5.7		11.3		13.3	13.0		6.2	8.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		46.4	5.7		11.3		13.3	13.0		6.2	8.0	
LOS		D	A		B		B	B		A	A	
Approach Delay		40.6			11.3			13.0			7.9	
Approach LOS		D			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 63 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 71.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Brant St & Ghent Ave

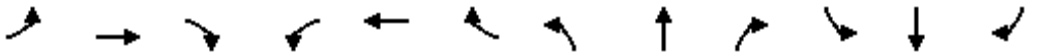




Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	254	42	175	18	761	63	1007
v/c Ratio	0.79	0.10	0.39	0.08	0.42	0.18	0.54
Control Delay	46.4	5.7	11.3	13.3	13.0	6.2	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.4	5.7	11.3	13.3	13.0	6.2	8.0
Queue Length 50th (m)	40.3	0.0	8.0	1.3	36.4	2.3	18.2
Queue Length 95th (m)	58.9	5.5	20.7	5.9	61.6	m7.3	95.9
Internal Link Dist (m)	92.2		147.8		85.5		130.5
Turn Bay Length (m)		15.0		25.0		15.0	
Base Capacity (vph)	443	581	576	213	1830	359	1848
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.07	0.30	0.08	0.42	0.18	0.54

Intersection Summary

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

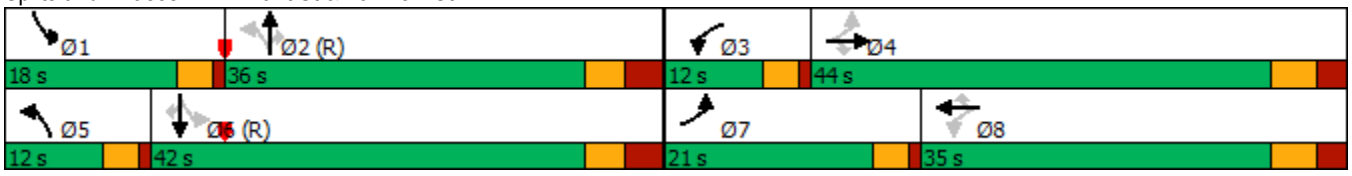


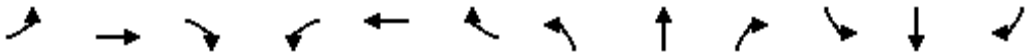
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	306	1012	234	116	321	138	186	657	258	208	692	137
Future Volume (vph)	306	1012	234	116	321	138	186	657	258	208	692	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		100.0	30.0		0.0	25.0		20.0	40.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	0.0			80.0			70.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	1.00			0.99		0.96	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1722	3614	1601	1807	3510	1570	1807	3510	1498	1789	3579	1420
Flt Permitted	0.431			0.138			0.249			0.182		
Satd. Flow (perm)	781	3614	1571	262	3510	1570	469	3510	1438	341	3579	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			253			193			192			153
Link Speed (k/h)		60			40			50			60	
Link Distance (m)		121.4			138.6			294.1			96.5	
Travel Time (s)		7.3			12.5			21.2			5.8	
Confl. Peds. (#/hr)			5	5			22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	1%	2%	1%	4%	4%	1%	4%	9%	2%	2%	15%
Adj. Flow (vph)	333	1100	254	126	349	150	202	714	280	226	752	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	333	1100	254	126	349	150	202	714	280	226	752	149
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)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	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	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	0.0
Detector 1 Size(m)	6.1	1.8	6.1	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	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	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	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	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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	30.5	30.5
Total Split (s)	21.0	44.0	44.0	12.0	35.0	35.0	12.0	36.0	36.0	18.0	42.0	42.0
Total Split (%)	19.1%	40.0%	40.0%	10.9%	31.8%	31.8%	10.9%	32.7%	32.7%	16.4%	38.2%	38.2%
Maximum Green (s)	17.0	37.6	37.6	8.0	28.6	28.6	8.0	29.5	29.5	14.0	35.5	35.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	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	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	51.6	37.3	37.3	39.3	29.0	29.0	41.9	31.1	31.1	49.7	35.6	35.6
Actuated g/C Ratio	0.47	0.34	0.34	0.36	0.26	0.26	0.38	0.28	0.28	0.45	0.32	0.32
v/c Ratio	0.66	0.90	0.36	0.62	0.38	0.27	0.72	0.72	0.51	0.70	0.65	0.27
Control Delay	26.3	45.5	4.9	32.9	34.6	3.1	37.5	40.9	14.9	31.1	35.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	45.5	4.9	32.9	34.6	3.1	37.5	40.9	14.9	31.1	35.1	5.5
LOS	C	D	A	C	C	A	D	D	B	C	D	A
Approach Delay		35.6			26.7			34.3			30.4	
Approach LOS		D			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 32.8		Intersection LOS: C	
Intersection Capacity Utilization 83.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Brant St & Fairview St

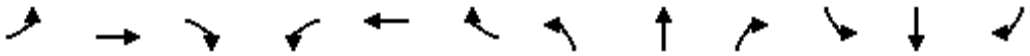




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	333	1100	254	126	349	150	202	714	280	226	752	149
v/c Ratio	0.66	0.90	0.36	0.62	0.38	0.27	0.72	0.72	0.51	0.70	0.65	0.27
Control Delay	26.3	45.5	4.9	32.9	34.6	3.1	37.5	40.9	14.9	31.1	35.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	45.5	4.9	32.9	34.6	3.1	37.5	40.9	14.9	31.1	35.1	5.5
Queue Length 50th (m)	45.4	116.6	0.2	14.9	32.4	0.0	26.0	74.2	14.8	29.5	72.4	0.0
Queue Length 95th (m)	68.0	#153.9	16.8	#29.2	45.7	7.6	#50.0	95.6	40.2	46.2	92.7	13.1
Internal Link Dist (m)		97.4			114.6			270.1			72.5	
Turn Bay Length (m)	30.0		100.0	30.0			25.0		20.0	40.0		
Base Capacity (vph)	511	1246	707	208	931	558	279	998	546	340	1175	549
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.88	0.36	0.61	0.37	0.27	0.72	0.72	0.51	0.66	0.64	0.27

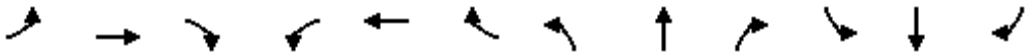
Intersection Summary

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)	9	161	2	0	212	13	8	1	1	16	0	6
Future Volume (vph)	9	161	2	0	212	13	8	1	1	16	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.992			0.988			0.961	
Flt Protected		0.997						0.961			0.966	
Satd. Flow (prot)	0	1876	0	0	1868	0	0	1788	0	0	1748	0
Flt Permitted		0.997						0.961			0.966	
Satd. Flow (perm)	0	1876	0	0	1868	0	0	1788	0	0	1748	0
Link Speed (k/h)		40			40			48			40	
Link Distance (m)		44.1			71.0			49.3			133.9	
Travel Time (s)		4.0			6.4			3.7			12.1	
Confl. Peds. (#/hr)	9		5	5		9	1					1
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)	10	175	2	0	230	14	9	1	1	17	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	187	0	0	244	0	0	11	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
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												
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
Sign Control		Free			Free			Stop			Stop	

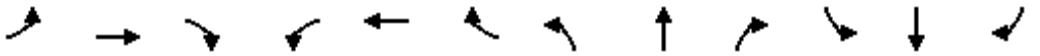
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	161	2	0	212	13	8	1	1	16	0	6
Future Volume (Veh/h)	9	161	2	0	212	13	8	1	1	16	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	175	2	0	230	14	9	1	1	17	0	7
Pedestrians		1						5			9	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		109										
pX, platoon unblocked												
vC, conflicting volume	253			182			446	454	181	444	448	247
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	253			182			446	454	181	444	448	247
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	100	100	97	100	99
cM capacity (veh/h)	1301			1386			507	491	857	510	495	784

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	187	244	11	24
Volume Left	10	0	9	17
Volume Right	2	14	1	7
cSH	1301	1386	525	568
Volume to Capacity	0.01	0.00	0.02	0.04
Queue Length 95th (m)	0.2	0.0	0.5	1.0
Control Delay (s)	0.5	0.0	12.0	11.6
Lane LOS	A		B	B
Approach Delay (s)	0.5	0.0	12.0	11.6
Approach LOS			B	B

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	26.3%	ICU Level of Service	A	
Analysis Period (min)	15			



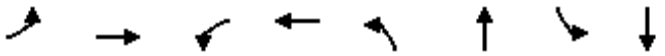
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	18	39	118	11	165	14	1095	69	108	1073	55
Future Volume (vph)	113	18	39	118	11	165	14	1095	69	108	1073	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	15.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	60.0			40.0			10.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.98	0.97		1.00	1.00		0.99	1.00	
Frt		0.898			0.859			0.991			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1579	1517	0	1643	1371	0	1428	3214	0	1610	3218	0
Flt Permitted	0.552			0.717			0.166			0.156		
Satd. Flow (perm)	908	1517	0	1215	1371	0	249	3214	0	263	3218	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			179			11			9	
Link Speed (k/h)		40			64			50			50	
Link Distance (m)		79.4			64.6			154.5			294.1	
Travel Time (s)		7.1			3.6			11.1			21.2	
Confl. Peds. (#/hr)	9		13	13		9	20		31	31		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	0%	0%	0%	6%	15%	1%	0%	2%	1%	4%
Adj. Flow (vph)	123	20	42	128	12	179	15	1190	75	117	1166	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	62	0	128	191	0	15	1265	0	117	1226	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		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			Yes	
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	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	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		41.0	41.0		9.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	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	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	3.0	3.0		3.0	3.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	14.6	14.6		14.6	14.6		52.7	52.7		63.0	52.7	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.59	0.59		0.70	0.59	
v/c Ratio	0.84	0.22		0.65	0.51		0.10	0.67		0.40	0.65	
Control Delay	79.3	17.1		51.2	11.8		7.7	10.7		8.1	15.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	79.3	17.1		51.2	11.8		7.7	10.7		8.1	15.6	
LOS	E	B		D	B		A	B		A	B	
Approach Delay		58.5			27.6			10.6			15.0	
Approach LOS		E			C			B			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 85 (94%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 17.1		Intersection LOS: B	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Brant St & Grahams Ln/Prospect St

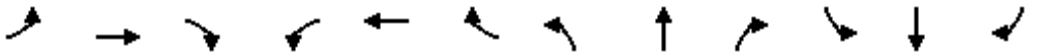




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	62	128	191	15	1265	117	1226
v/c Ratio	0.84	0.22	0.65	0.51	0.10	0.67	0.40	0.65
Control Delay	79.3	17.1	51.2	11.8	7.7	10.7	8.1	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	17.1	51.2	11.8	7.7	10.7	8.1	15.6
Queue Length 50th (m)	20.4	2.9	20.6	1.8	0.8	37.6	5.3	75.2
Queue Length 95th (m)	#48.4	13.4	#39.9	19.8	m1.4	44.1	10.0	102.5
Internal Link Dist (m)		55.4		40.6		130.5		270.1
Turn Bay Length (m)	30.0		20.0		15.0		20.0	
Base Capacity (vph)	161	304	216	390	145	1887	321	1889
Starvation Cap Reductn	0	0	0	0	0	1	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	0.76	0.20	0.59	0.49	0.10	0.67	0.36	0.65

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)	190	33	30	40	65	93	32	894	43	113	837	251
Future Volume (vph)	190	33	30	40	65	93	32	894	43	113	837	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		15.0	0.0		0.0	25.0		0.0	15.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		0.99		1.00	1.00		1.00	0.99	
Frt			0.850		0.937			0.993			0.965	
Flt Protected		0.959			0.990		0.950			0.950		
Satd. Flow (prot)	0	1743	1512	0	1734	0	1825	3421	0	1659	3282	0
Flt Permitted		0.585			0.883		0.175			0.228		
Satd. Flow (perm)	0	1062	1481	0	1545	0	335	3421	0	396	3282	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		57			7			58	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		116.2			171.8			109.5			154.5	
Travel Time (s)		10.5			15.5			7.9			11.1	
Confl. Peds. (#/hr)	3		10	10		3	20		15	15		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	4%	8%	0%	2%	3%	0%	6%	0%	10%	6%	6%
Adj. Flow (vph)	207	36	33	43	71	101	35	972	47	123	910	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	243	33	0	215	0	35	1019	0	123	1183	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
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	6.1	1.8		6.1	1.8		6.1	1.8	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/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	
Recall Mode	None	None	None	None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		25.1	25.1		25.1		50.9	50.9		50.9	50.9	
Actuated g/C Ratio		0.28	0.28		0.28		0.57	0.57		0.57	0.57	
v/c Ratio		0.82	0.07		0.46		0.19	0.53		0.55	0.63	
Control Delay		51.0	3.9		20.9		15.9	14.6		18.9	9.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.1	
Total Delay		51.0	3.9		20.9		15.9	14.6		18.9	9.1	
LOS		D	A		C		B	B		B	A	
Approach Delay		45.4			20.9			14.7			10.0	
Approach LOS		D			C			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 90.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Brant St & Ghent Ave





Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	243	33	215	35	1019	123	1183
v/c Ratio	0.82	0.07	0.46	0.19	0.53	0.55	0.63
Control Delay	51.0	3.9	20.9	15.9	14.6	18.9	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	51.0	3.9	20.9	15.9	14.6	18.9	9.1
Queue Length 50th (m)	38.8	0.0	21.7	2.8	54.1	6.0	27.7
Queue Length 95th (m)	58.8	3.9	35.9	10.4	87.5	m#16.0	38.2
Internal Link Dist (m)	92.2		147.8		85.5		130.5
Turn Bay Length (m)		15.0		25.0		15.0	
Base Capacity (vph)	401	589	619	189	1936	223	1880
Starvation Cap Reductn	0	0	0	0	0	0	69
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.06	0.35	0.19	0.53	0.55	0.65

Intersection Summary

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

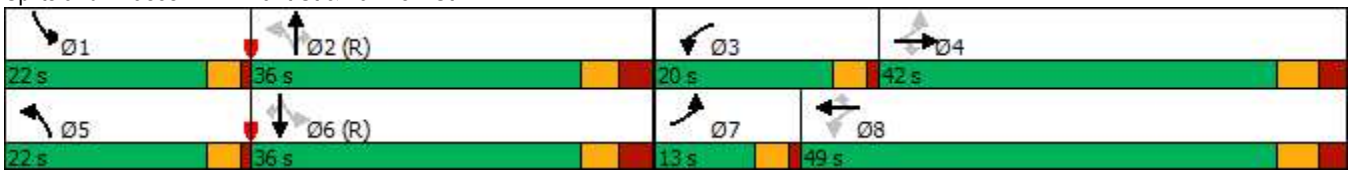
m Volume for 95th percentile queue is metered by upstream signal.

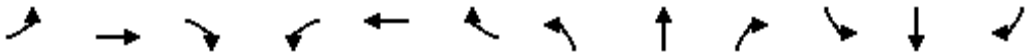
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	746	263	207	1387	393	310	800	183	212	692	393
Future Volume (vph)	193	746	263	207	1387	393	310	800	183	212	692	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		100.0	30.0		0.0	25.0		20.0	40.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	0.0			80.0			70.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97	1.00		0.98	0.99		0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3579	1601	1738	3614	1617	1789	3614	1633	1789	3579	1570
Flt Permitted	0.106			0.153			0.123			0.136		
Satd. Flow (perm)	202	3579	1558	279	3614	1590	230	3614	1505	256	3579	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			286			275			140			179
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		121.4			138.6			294.1			96.5	
Travel Time (s)		7.3			8.3			21.2			5.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	2%	2%	5%	1%	1%	2%	1%	0%	2%	2%	4%
Adj. Flow (vph)	210	811	286	225	1508	427	337	870	199	230	752	427
Shared Lane Traffic (%)												
Lane Group Flow (vph)	210	811	286	225	1508	427	337	870	199	230	752	427
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	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	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	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	0.0
Detector 1 Size(m)	6.1	1.8	6.1	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	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	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	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	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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	30.5	30.5
Total Split (s)	13.0	42.0	42.0	20.0	49.0	49.0	22.0	36.0	36.0	22.0	36.0	36.0
Total Split (%)	10.8%	35.0%	35.0%	16.7%	40.8%	40.8%	18.3%	30.0%	30.0%	18.3%	30.0%	30.0%
Maximum Green (s)	9.0	35.6	35.6	16.0	42.6	42.6	18.0	29.5	29.5	18.0	29.5	29.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	2.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	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	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	49.0	37.6	37.6	57.4	46.6	42.6	52.0	32.4	32.4	47.1	29.5	29.5
Actuated g/C Ratio	0.41	0.31	0.31	0.48	0.39	0.36	0.43	0.27	0.27	0.39	0.25	0.25
v/c Ratio	1.04	0.72	0.42	0.74	1.07	0.58	1.01	0.89	0.39	0.78	0.86	0.84
Control Delay	103.0	41.5	5.7	35.3	82.6	13.9	86.1	55.1	14.7	45.1	54.1	40.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.0	41.5	5.7	35.3	82.6	13.9	86.1	55.1	14.7	45.1	54.1	40.9
LOS	F	D	A	D	F	B	F	E	B	D	D	D
Approach Delay		43.5			64.1			56.8			48.6	
Approach LOS		D			E			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 54.7		Intersection LOS: D	
Intersection Capacity Utilization 101.6%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 4: Brant St & Fairview St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	811	286	225	1508	427	337	870	199	230	752	427
v/c Ratio	1.04	0.72	0.42	0.74	1.07	0.58	1.01	0.89	0.39	0.78	0.86	0.84
Control Delay	103.0	41.5	5.7	35.3	82.6	13.9	86.1	55.1	14.7	45.1	54.1	40.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.0	41.5	5.7	35.3	82.6	13.9	86.1	55.1	14.7	45.1	54.1	40.9
Queue Length 50th (m)	~37.0	90.1	0.0	30.6	~207.9	26.6	~65.0	105.0	10.7	34.6	89.3	58.5
Queue Length 95th (m)	#86.2	114.4	19.2	52.1	#250.2	58.7	#126.2	#149.0	31.7	60.8	#118.4	#112.4
Internal Link Dist (m)		97.4			114.6			270.1			72.5	
Turn Bay Length (m)	30.0		100.0	30.0			25.0		20.0	40.0		
Base Capacity (vph)	202	1120	684	329	1403	741	333	975	508	336	879	507
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.72	0.42	0.68	1.07	0.58	1.01	0.89	0.39	0.68	0.86	0.84

Intersection Summary

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

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

APPENDIX H

TTS Data

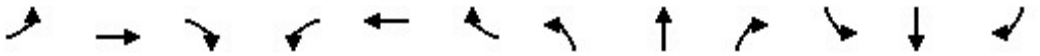
TTS Directional Distribution Summary:

Notes:
1. Directions determined based on centroid coordinates of destination/origin planning districts.
2. 'Internal' refers to local trips made within the home planning district(s), while 'External' refers to trips made to areas outside of the home planning district(s).
3. 'I' refers to local trips made within the subject TAZ that do not have a cardinal direction assigned to them. These trips are excluded from the analysis.

	Time Period	Direction	Internal									External								Total
			I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	
Trips	A.M.	Inbound	330	156	0	62	212	27	0	52	0	0	0	0	24	0	0	0	12	875
		Outbound	330	12	67	90	67	123	0	0	66	0	0	0	93	0	0	191	0	1039
	P.M.	Inbound	1904	488	189	1058	1398	386	0	100	116	182	49	574	1914	0	0	381	577	9316
		Outbound	1904	255	860	464	628	325	0	0	698	532	107	683	605	0	0	1407	612	9080
Percentage	A.M.	Inbound	38%	18%	0%	7%	24%	3%	0%	6%	0%	0%	0%	0%	3%	0%	0%	0%	1%	100%
		Outbound	32%	1%	6%	9%	6%	12%	0%	0%	6%	0%	0%	0%	9%	0%	0%	18%	0%	100%
	P.M.	Inbound	20%	5%	2%	11%	15%	4%	0%	1%	1%	2%	1%	6%	21%	0%	0%	4%	6%	100%
		Outbound	21%	3%	9%	5%	7%	4%	0%	0%	8%	6%	1%	8%	7%	0%	0%	16%	7%	100%

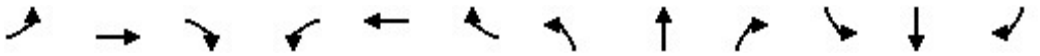
APPENDIX I

Detailed Capacity Analysis – 2027 Future Total



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	109	0	0	151	8	5	1	0	15	0	6
Future Volume (vph)	1	109	0	0	151	8	5	1	0	15	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.993						0.959	
Flt Protected								0.960			0.966	
Satd. Flow (prot)	0	1883	0	0	1870	0	0	1808	0	0	1745	0
Flt Permitted								0.960			0.966	
Satd. Flow (perm)	0	1883	0	0	1870	0	0	1808	0	0	1745	0
Link Speed (k/h)		30			40			30			40	
Link Distance (m)		44.1			71.0			49.3			133.9	
Travel Time (s)		5.3			6.4			5.9			12.1	
Confl. Peds. (#/hr)	6		5	5		6	4					4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	118	0	0	164	9	5	1	0	16	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	119	0	0	173	0	0	6	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
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												
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)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.6%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	109	0	0	151	8	5	1	0	15	0	6
Future Volume (Veh/h)	1	109	0	0	151	8	5	1	0	15	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	118	0	0	164	9	5	1	0	16	0	7
Pedestrians		4						5			6	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		109										
pX, platoon unblocked												
vC, conflicting volume	179			123			304	304	123	295	300	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	179			123			304	304	123	295	300	178
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	98	100	99
cM capacity (veh/h)	1394			1462			639	607	927	653	610	862

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	119	173	6	23
Volume Left	1	0	5	16
Volume Right	0	9	0	7
cSH	1394	1462	633	705
Volume to Capacity	0.00	0.00	0.01	0.03
Queue Length 95th (m)	0.0	0.0	0.2	0.8
Control Delay (s)	0.1	0.0	10.7	10.3
Lane LOS	A		B	B
Approach Delay (s)	0.1	0.0	10.7	10.3
Approach LOS			B	B

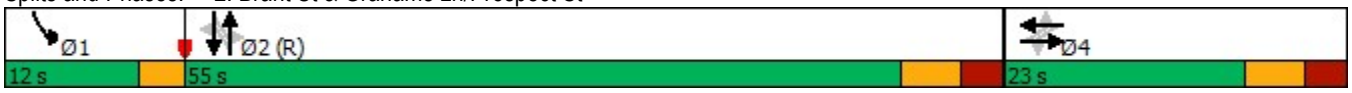
Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	20.6%	ICU Level of Service	A	
Analysis Period (min)	15			

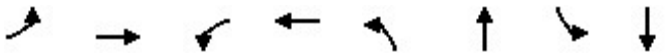
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	10	15	71	14	114	24	894	63	98	917	80
Future Volume (vph)	31	10	15	71	14	114	24	894	63	98	917	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	15.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	60.0			40.0			10.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.98		1.00	1.00		0.99	1.00	
Frt		0.911			0.866			0.990			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1579	1491	0	1610	1472	0	1643	3145	0	1610	3140	0
Flt Permitted	0.668			0.740			0.222			0.236		
Satd. Flow (perm)	1104	1491	0	1240	1472	0	382	3145	0	397	3140	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			124			12			15	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		79.4			64.6			154.5			294.1	
Travel Time (s)		7.1			5.8			11.1			21.2	
Confl. Peds. (#/hr)	4		7	7		4	19		30	30		19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	7%	2%	0%	0%	0%	3%	3%	2%	3%	3%
Adj. Flow (vph)	34	11	16	77	15	124	26	972	68	107	997	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	27	0	77	139	0	26	1040	0	107	1084	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		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			Yes	
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	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	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		41.0	41.0		9.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	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	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	3.0	3.0		3.0	3.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	11.3	11.3		11.3	11.3		56.3	56.3		66.3	56.3	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.63	0.63		0.74	0.63	
v/c Ratio	0.25	0.13		0.49	0.47		0.11	0.53		0.28	0.55	
Control Delay	38.5	21.4		46.8	14.1		9.1	8.8		5.1	12.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.5	21.4		46.8	14.1		9.1	8.8		5.1	12.0	
LOS	D	C		D	B		A	A		A	B	
Approach Delay		30.9			25.8			8.8			11.4	
Approach LOS		C			C			A			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 43 (48%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 77.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Brant St & Grahams Ln/Prospect St

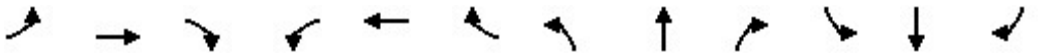




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	27	77	139	26	1040	107	1084
v/c Ratio	0.25	0.13	0.49	0.47	0.11	0.53	0.28	0.55
Control Delay	38.5	21.4	46.8	14.1	9.1	8.8	5.1	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	21.4	46.8	14.1	9.1	8.8	5.1	12.0
Queue Length 50th (m)	5.4	1.7	12.7	2.4	1.3	35.7	3.6	52.1
Queue Length 95th (m)	13.4	8.5	24.7	17.4	m4.5	61.0	9.3	85.5
Internal Link Dist (m)		55.4		40.6		130.5		270.1
Turn Bay Length (m)	30.0		20.0		15.0		20.0	
Base Capacity (vph)	196	278	220	363	239	1973	419	1971
Starvation Cap Reductn	0	0	0	0	0	76	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.10	0.35	0.38	0.11	0.55	0.26	0.55

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)	200	35	39	43	13	106	17	669	36	59	801	136
Future Volume (vph)	200	35	39	43	13	106	17	669	36	59	801	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		15.0	0.0		0.0	25.0		0.0	15.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00		1.00	1.00		0.98	0.99	
Frt			0.850		0.912			0.992			0.978	
Flt Protected		0.959			0.987		0.950			0.950		
Satd. Flow (prot)	0	1755	1484	0	1642	0	1534	3211	0	1825	3228	0
Flt Permitted		0.640			0.805		0.229			0.331		
Satd. Flow (perm)	0	1171	1460	0	1339	0	368	3211	0	626	3228	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		115			8			29	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		116.2			171.8			109.5			154.5	
Travel Time (s)		10.5			15.5			7.9			11.1	
Confl. Peds. (#/hr)			5	5			15		31	31		15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	10%	0%	4%	19%	13%	0%	0%	10%	9%
Adj. Flow (vph)	217	38	42	47	14	115	18	727	39	64	871	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	255	42	0	176	0	18	766	0	64	1019	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			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)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
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	6.1	1.8		6.1	1.8		6.1	1.8	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/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	
Recall Mode	None	None	None	None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		24.9	24.9		24.9		51.1	51.1		51.1	51.1	
Actuated g/C Ratio		0.28	0.28		0.28		0.57	0.57		0.57	0.57	
v/c Ratio		0.79	0.10		0.39		0.09	0.42		0.18	0.55	
Control Delay		46.5	5.7		11.2		13.4	13.1		6.3	7.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		46.5	5.7		11.2		13.4	13.1		6.3	7.8	
LOS		D	A		B		B	B		A	A	
Approach Delay		40.7			11.2			13.1			7.7	
Approach LOS		D			B			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 14.0 Intersection LOS: B
Intersection Capacity Utilization 71.4% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: Brant St & Ghent Ave

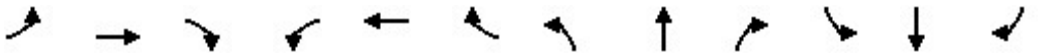




Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	255	42	176	18	766	64	1019
v/c Ratio	0.79	0.10	0.39	0.09	0.42	0.18	0.55
Control Delay	46.5	5.7	11.2	13.4	13.1	6.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	5.7	11.2	13.4	13.1	6.3	7.8
Queue Length 50th (m)	40.4	0.0	7.9	1.3	36.7	2.5	19.2
Queue Length 95th (m)	59.1	5.5	20.7	5.9	62.2	m5.8	91.4
Internal Link Dist (m)	92.2		147.8		85.5		130.5
Turn Bay Length (m)		15.0		25.0		15.0	
Base Capacity (vph)	442	581	577	209	1827	355	1846
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.07	0.31	0.09	0.42	0.18	0.55

Intersection Summary

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

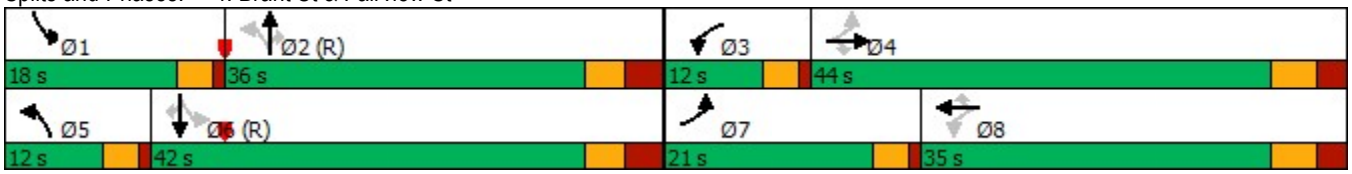


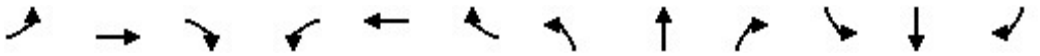
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	306	1012	238	118	321	138	192	687	261	208	702	137
Future Volume (vph)	306	1012	238	118	321	138	192	687	261	208	702	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		100.0	30.0		0.0	25.0		20.0	40.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			80.0			70.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	1.00			0.99		0.96	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1722	3614	1601	1807	3510	1570	1807	3510	1498	1789	3579	1420
Flt Permitted	0.431			0.137			0.242			0.161		
Satd. Flow (perm)	781	3614	1571	260	3510	1570	456	3510	1438	301	3579	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			251			193			192			153
Link Speed (k/h)		60			40			50			60	
Link Distance (m)		121.4			138.6			294.1			96.5	
Travel Time (s)		7.3			12.5			21.2			5.8	
Confl. Peds. (#/hr)			5	5			22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	1%	2%	1%	4%	4%	1%	4%	9%	2%	2%	15%
Adj. Flow (vph)	333	1100	259	128	349	150	209	747	284	226	763	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	333	1100	259	128	349	150	209	747	284	226	763	149
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)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	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	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	0.0
Detector 1 Size(m)	6.1	1.8	6.1	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	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	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	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	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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	30.5	30.5
Total Split (s)	21.0	44.0	44.0	12.0	35.0	35.0	12.0	36.0	36.0	18.0	42.0	42.0
Total Split (%)	19.1%	40.0%	40.0%	10.9%	31.8%	31.8%	10.9%	32.7%	32.7%	16.4%	38.2%	38.2%
Maximum Green (s)	17.0	37.6	37.6	8.0	28.6	28.6	8.0	29.5	29.5	14.0	35.5	35.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	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	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	51.6	37.3	37.3	39.4	29.1	29.1	41.8	31.0	31.0	49.6	35.6	35.6
Actuated g/C Ratio	0.47	0.34	0.34	0.36	0.26	0.26	0.38	0.28	0.28	0.45	0.32	0.32
v/c Ratio	0.66	0.90	0.37	0.63	0.38	0.27	0.76	0.76	0.52	0.73	0.66	0.27
Control Delay	26.3	45.5	5.3	33.8	34.6	3.1	40.7	42.3	15.3	34.1	35.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	45.5	5.3	33.8	34.6	3.1	40.7	42.3	15.3	34.1	35.4	5.5
LOS	C	D	A	C	C	A	D	D	B	C	D	A
Approach Delay		35.6			26.9			35.8			31.2	
Approach LOS		D			C			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 33.4		Intersection LOS: C	
Intersection Capacity Utilization 83.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Brant St & Fairview St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	333	1100	259	128	349	150	209	747	284	226	763	149
v/c Ratio	0.66	0.90	0.37	0.63	0.38	0.27	0.76	0.76	0.52	0.73	0.66	0.27
Control Delay	26.3	45.5	5.3	33.8	34.6	3.1	40.7	42.3	15.3	34.1	35.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	45.5	5.3	33.8	34.6	3.1	40.7	42.3	15.3	34.1	35.4	5.5
Queue Length 50th (m)	45.4	116.6	1.1	15.1	32.4	0.0	26.9	78.5	15.5	29.5	73.7	0.0
Queue Length 95th (m)	68.0	#153.9	17.9	#31.5	45.7	7.6	#54.7	100.8	41.7	#50.0	94.4	13.1
Internal Link Dist (m)		97.4			114.6			270.1			72.5	
Turn Bay Length (m)	30.0		100.0	30.0			25.0		20.0	40.0		
Base Capacity (vph)	511	1242	704	207	927	557	275	991	544	327	1167	546
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.89	0.37	0.62	0.38	0.27	0.76	0.75	0.52	0.69	0.65	0.27

Intersection Summary

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



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	150	20	14	148	55	9
Future Volume (vph)	150	20	14	148	55	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.984				0.981	
Flt Protected				0.996	0.959	
Satd. Flow (prot)	1853	0	0	1876	1772	0
Flt Permitted				0.996	0.959	
Satd. Flow (perm)	1853	0	0	1876	1772	0
Link Speed (k/h)	40			40	30	
Link Distance (m)	64.6			44.1	48.8	
Travel Time (s)	5.8			4.0	5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	22	15	161	60	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	185	0	0	176	70	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		9	15		15	9
Sign Control	Free			Free	Stop	

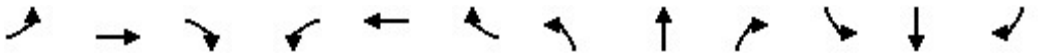
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.7%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	150	20	14	148	55	9
Future Volume (Veh/h)	150	20	14	148	55	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	22	15	161	60	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	65					
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			185		365	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			177		358	166
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		90	99
cM capacity (veh/h)			1391		630	873

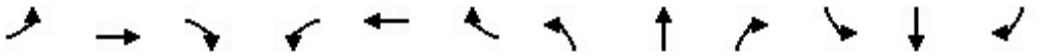
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	185	176	70
Volume Left	0	15	60
Volume Right	22	0	10
cSH	1700	1391	656
Volume to Capacity	0.11	0.01	0.11
Queue Length 95th (m)	0.0	0.2	2.7
Control Delay (s)	0.0	0.7	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	11.1
Approach LOS			B

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	29.7%	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)	10	167	2	0	230	13	8	1	1	16	0	7
Future Volume (vph)	10	167	2	0	230	13	8	1	1	16	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.993			0.988			0.957	
Flt Protected		0.997						0.961			0.967	
Satd. Flow (prot)	0	1876	0	0	1870	0	0	1788	0	0	1743	0
Flt Permitted		0.997						0.961			0.967	
Satd. Flow (perm)	0	1876	0	0	1870	0	0	1788	0	0	1743	0
Link Speed (k/h)		40			40			48			40	
Link Distance (m)		44.1			71.0			49.3			133.9	
Travel Time (s)		4.0			6.4			3.7			12.1	
Confl. Peds. (#/hr)	9		5	5		9	1					1
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)	11	182	2	0	250	14	9	1	1	17	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	195	0	0	264	0	0	11	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
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												
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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.4%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	167	2	0	230	13	8	1	1	16	0	7
Future Volume (Veh/h)	10	167	2	0	230	13	8	1	1	16	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	182	2	0	250	14	9	1	1	17	0	8
Pedestrians		1						5			9	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		109										
pX, platoon unblocked												
vC, conflicting volume	273			189			476	483	188	472	477	267
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			189			476	483	188	472	477	267
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	100	100	97	100	99
cM capacity (veh/h)	1279			1378			483	473	850	488	476	764

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	195	264	11	25
Volume Left	11	0	9	17
Volume Right	2	14	1	8
cSH	1279	1378	501	552
Volume to Capacity	0.01	0.00	0.02	0.05
Queue Length 95th (m)	0.2	0.0	0.5	1.1
Control Delay (s)	0.5	0.0	12.3	11.8
Lane LOS	A		B	B
Approach Delay (s)	0.5	0.0	12.3	11.8
Approach LOS			B	B

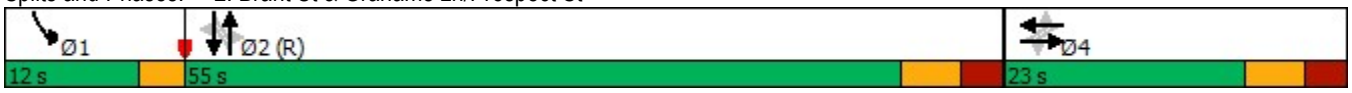
Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	27.4%	ICU Level of Service	A	
Analysis Period (min)	15			

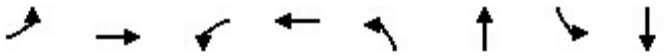
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	25	39	121	21	199	14	1095	74	145	1073	55
Future Volume (vph)	113	25	39	121	21	199	14	1095	74	145	1073	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	20.0		0.0	15.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	60.0			40.0			10.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.98	0.98		1.00	1.00		0.99	1.00	
Frt		0.909			0.864			0.991			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1579	1540	0	1643	1383	0	1428	3213	0	1610	3218	0
Flt Permitted	0.448			0.712			0.154			0.141		
Satd. Flow (perm)	738	1540	0	1207	1383	0	231	3213	0	238	3218	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			211			12			9	
Link Speed (k/h)		40			64			50			50	
Link Distance (m)		79.4			64.6			154.5			294.1	
Travel Time (s)		7.1			3.6			11.1			21.2	
Confl. Peds. (#/hr)	9		13	13		9	20		31	31		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	0%	0%	0%	6%	15%	1%	0%	2%	1%	4%
Adj. Flow (vph)	123	27	42	132	23	216	15	1190	80	158	1166	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	69	0	132	239	0	15	1270	0	158	1226	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		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			Yes	
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	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	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		41.0	41.0		9.0	41.0	
Total Split (s)	23.0	23.0		23.0	23.0		55.0	55.0		12.0	55.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		61.1%	61.1%		13.3%	61.1%	
Maximum Green (s)	16.0	16.0		16.0	16.0		48.0	48.0		9.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead	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	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	3.0	3.0		3.0	3.0		23.0	23.0			23.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	16.2	16.2		16.2	16.2		48.8	48.8		60.8	48.8	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.54	0.54		0.68	0.54	
v/c Ratio	0.92	0.22		0.61	0.57		0.12	0.73		0.56	0.70	
Control Delay	101.1	17.9		47.6	12.8		8.4	13.1		14.0	18.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	101.1	17.9		47.6	12.8		8.4	13.1		14.0	18.0	
LOS	F	B		D	B		A	B		B	B	
Approach Delay		71.2			25.2			13.0			17.5	
Approach LOS		E			C			B			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 85 (94%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 88.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Brant St & Grahams Ln/Prospect St

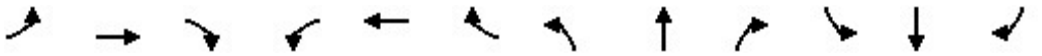




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	69	132	239	15	1270	158	1226
v/c Ratio	0.92	0.22	0.61	0.57	0.12	0.73	0.56	0.70
Control Delay	101.1	17.9	47.6	12.8	8.4	13.1	14.0	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.1	17.9	47.6	12.8	8.4	13.1	14.0	18.0
Queue Length 50th (m)	21.2	4.0	21.3	4.1	0.8	37.7	7.4	77.0
Queue Length 95th (m)	#53.9	15.0	#43.5	25.3	m1.4	44.2	18.0	102.5
Internal Link Dist (m)		55.4		40.6		130.5		270.1
Turn Bay Length (m)	30.0		20.0		15.0		20.0	
Base Capacity (vph)	133	311	217	422	125	1746	300	1747
Starvation Cap Reductn	0	0	0	0	0	1	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	0.92	0.22	0.61	0.57	0.12	0.73	0.53	0.70

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)	191	33	30	40	65	94	32	898	43	114	840	251
Future Volume (vph)	191	33	30	40	65	94	32	898	43	114	840	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		15.0	0.0		0.0	25.0		0.0	15.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		0.99		1.00	1.00		1.00	0.99	
Frt			0.850		0.936			0.993			0.965	
Flt Protected		0.959			0.990		0.950			0.950		
Satd. Flow (prot)	0	1743	1512	0	1732	0	1825	3421	0	1659	3282	0
Flt Permitted		0.584			0.883		0.173			0.226		
Satd. Flow (perm)	0	1060	1481	0	1543	0	331	3421	0	393	3282	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48		58			7			58	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		116.2			171.8			109.5			154.5	
Travel Time (s)		10.5			15.5			7.9			11.1	
Confl. Peds. (#/hr)	3		10	10		3	20		15	15		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	4%	8%	0%	2%	3%	0%	6%	0%	10%	6%	6%
Adj. Flow (vph)	208	36	33	43	71	102	35	976	47	124	913	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	244	33	0	216	0	35	1023	0	124	1186	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5		6.1	30.5		6.1	30.5	
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	6.1	1.8		6.1	1.8		6.1	1.8	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Detector Phase	4	4	4	4	4		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		34.0	34.0		34.0	34.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%		54.4%	54.4%		54.4%	54.4%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Lead/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	
Recall Mode	None	None	None	None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	15.0	15.0	15.0	15.0	15.0		16.0	16.0		16.0	16.0	
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		25.2	25.2		25.2		50.8	50.8		50.8	50.8	
Actuated g/C Ratio		0.28	0.28		0.28		0.56	0.56		0.56	0.56	
v/c Ratio		0.82	0.07		0.46		0.19	0.53		0.56	0.63	
Control Delay		51.2	3.9		20.8		16.0	14.7		19.1	9.3	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.1	
Total Delay		51.2	3.9		20.8		16.0	14.7		19.1	9.4	
LOS		D	A		C		B	B		B	A	
Approach Delay		45.6			20.8			14.8			10.3	
Approach LOS		D			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 90.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Brant St & Ghent Ave

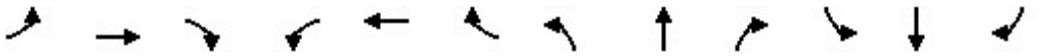




Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	244	33	216	35	1023	124	1186
v/c Ratio	0.82	0.07	0.46	0.19	0.53	0.56	0.63
Control Delay	51.2	3.9	20.8	16.0	14.7	19.1	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	51.2	3.9	20.8	16.0	14.7	19.1	9.4
Queue Length 50th (m)	38.9	0.0	21.7	2.8	54.6	6.1	28.2
Queue Length 95th (m)	59.1	3.9	35.9	10.5	87.9	m10.3	38.7
Internal Link Dist (m)	92.2		147.8		85.5		130.5
Turn Bay Length (m)		15.0		25.0		15.0	
Base Capacity (vph)	400	589	619	186	1934	221	1877
Starvation Cap Reductn	0	0	0	0	0	0	68
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.06	0.35	0.19	0.53	0.56	0.66

Intersection Summary

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

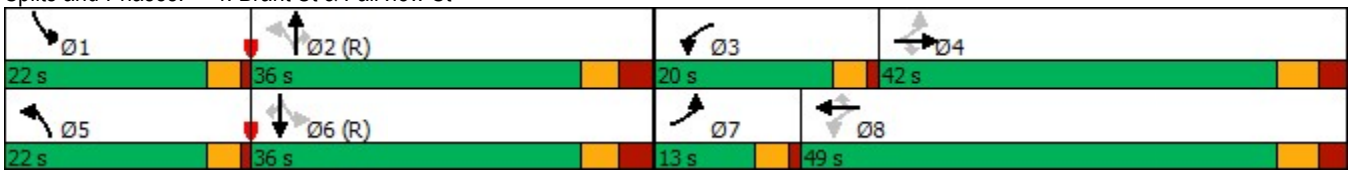


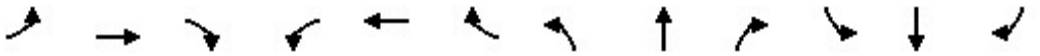
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	746	267	211	1387	393	316	827	185	212	723	393
Future Volume (vph)	193	746	267	211	1387	393	316	827	185	212	723	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		100.0	30.0		0.0	25.0		20.0	40.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			80.0			70.0			30.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97	1.00		0.98	1.00		0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3579	1601	1738	3614	1617	1789	3614	1633	1789	3579	1570
Flt Permitted	0.107			0.151			0.123			0.136		
Satd. Flow (perm)	204	3579	1558	276	3614	1590	231	3614	1505	256	3579	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			290			275			140			178
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		121.4			138.6			294.1			96.5	
Travel Time (s)		7.3			8.3			21.2			5.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	2%	2%	5%	1%	1%	2%	1%	0%	2%	2%	4%
Adj. Flow (vph)	210	811	290	229	1508	427	343	899	201	230	786	427
Shared Lane Traffic (%)												
Lane Group Flow (vph)	210	811	290	229	1508	427	343	899	201	230	786	427
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	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	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	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	0.0
Detector 1 Size(m)	6.1	1.8	6.1	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	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	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	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	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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	11.5	30.4	30.4	11.5	30.4	30.4	11.5	30.5	30.5	11.5	30.5	30.5
Total Split (s)	13.0	42.0	42.0	20.0	49.0	49.0	22.0	36.0	36.0	22.0	36.0	36.0
Total Split (%)	10.8%	35.0%	35.0%	16.7%	40.8%	40.8%	18.3%	30.0%	30.0%	18.3%	30.0%	30.0%
Maximum Green (s)	9.0	35.6	35.6	16.0	42.6	42.6	18.0	29.5	29.5	18.0	29.5	29.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.4	6.4	4.0	2.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	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	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	48.8	37.4	37.4	57.5	46.6	42.6	52.0	32.4	32.4	47.1	29.5	29.5
Actuated g/C Ratio	0.41	0.31	0.31	0.48	0.39	0.36	0.43	0.27	0.27	0.39	0.25	0.25
v/c Ratio	1.03	0.73	0.42	0.75	1.07	0.58	1.03	0.92	0.40	0.78	0.89	0.84
Control Delay	102.0	41.6	5.7	36.3	82.6	13.9	90.6	58.5	14.9	45.1	57.6	41.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.0	41.6	5.7	36.3	82.6	13.9	90.6	58.5	14.9	45.1	57.6	41.1
LOS	F	D	A	D	F	B	F	E	B	D	E	D
Approach Delay		43.4			64.2			60.1			50.7	
Approach LOS		D			E			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 55.9		Intersection LOS: E	
Intersection Capacity Utilization 102.0%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 4: Brant St & Fairview St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	811	290	229	1508	427	343	899	201	230	786	427
v/c Ratio	1.03	0.73	0.42	0.75	1.07	0.58	1.03	0.92	0.40	0.78	0.89	0.84
Control Delay	102.0	41.6	5.7	36.3	82.6	13.9	90.6	58.5	14.9	45.1	57.6	41.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.0	41.6	5.7	36.3	82.6	13.9	90.6	58.5	14.9	45.1	57.6	41.1
Queue Length 50th (m)	~36.9	90.4	0.0	31.2	~207.9	26.6	~69.8	109.7	11.1	34.6	94.5	58.8
Queue Length 95th (m)	#85.9	114.4	19.4	#54.0	#250.2	58.7	#129.5	#156.7	32.4	60.8	#127.6	#112.8
Internal Link Dist (m)		97.4			114.6			270.1			72.5	
Turn Bay Length (m)	30.0		100.0	30.0			25.0		20.0	40.0		
Base Capacity (vph)	203	1116	685	328	1403	741	333	975	508	336	879	506
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.73	0.42	0.70	1.07	0.58	1.03	0.92	0.40	0.68	0.89	0.84

Intersection Summary

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

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



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	196	48	18	226	45	7
Future Volume (vph)	196	48	18	226	45	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.974				0.981	
Flt Protected				0.996	0.959	
Satd. Flow (prot)	1834	0	0	1876	1772	0
Flt Permitted				0.996	0.959	
Satd. Flow (perm)	1834	0	0	1876	1772	0
Link Speed (k/h)	40			64	48	
Link Distance (m)	64.6			44.1	48.8	
Travel Time (s)	5.8			2.5	3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	213	52	20	246	49	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	265	0	0	266	57	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		60	60		60	60
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.7%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	196	48	18	226	45	7
Future Volume (Veh/h)	196	48	18	226	45	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	213	52	20	246	49	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	65					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			265		525	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		488	191
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		90	99
cM capacity (veh/h)			1302		511	819

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	265	266	57
Volume Left	0	20	49
Volume Right	52	0	8
cSH	1700	1302	540
Volume to Capacity	0.16	0.02	0.11
Queue Length 95th (m)	0.0	0.4	2.7
Control Delay (s)	0.0	0.7	12.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	12.5
Approach LOS			B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX J

Zoning By-Law Excerpts

USE	PARKING STANDARD
Apartment Building	**Within a Primary Growth Area as identified on Schedule B-1 of the City Official Plan (2020), as approved by Halton Region on November 30, 2020, and as may be further amended**: 1.25 spaces per unit inclusive of visitor parking. *This is an interim rate and is subject to further study to be undertaken by the City. An application to reduce this parking rate will be required to be supported by a parking justification study deemed acceptable by the City.* **Within a Secondary Growth Area as identified on Schedule B-1 of the City Official Plan (2020), as approved by the Halton Region on November 30, 2020, and as may be further amended:** 1.25 spaces per unit inclusive of visitor parking. **For all areas outside of Primary and Secondary Growth Area as identified on Schedule B-1 of the City Official Plan (2020), as approved by Halton Region on November 30, 2020, and as may be further amended:** 1 occupant spaces per one-bedroom unit 1.25 occupant spaces per two-bedroom unit 1.5 occupant spaces per three or more bedroom unit 0.25 visitor spaces per unit 1 additional space per 75 units for the use of maintenance vehicles servicing the site.
Dwelling Units on the 2nd or 3rd floor of a 2 or 3 storey commercial building	1.25 spaces per unit
Accessory Dwelling Unit	1 space
Adult Entertainment Establishment	1 space per 2 persons capacity
Bank, Trust Company, Credit Union	5 spaces per 100 m^2 gross floor area
Bed & Breakfast Home **Boarding House**	1 space per guest room in addition to the parking requirement for a detached dwelling
Cemetery	1 space per employee plus 1 per 4 seats chapel capacity
Community Institution	1 space per 4 persons capacity
Convent, Monastery	1 space per 2 beds
Convention/Conference/Banquet Centre	10 spaces per 100 m^2 gross floor area
Correctional Facility	0.85 spaces per employee 0.25 visitor spaces per resident
Correctional Group Home	4 parking spaces
Day Care Centre	4 spaces per 100 m^2 gross floor area
Emergency Shelter	0.85 spaces per employee 0.25 visitor spaces per resident
Entertainment Establishment	10 spaces per 100 m^2 of gross floor area

(6) **Multiple Zones**
Where a property is covered by more than one zone designation, required parking and loading facilities shall be provided within that area of the property zoned for the permitted use and within which the permitted use is located.

However, a driveway providing access from a street to service a property zoned for a permitted use may be located on land zoned for a different permitted use.

(7) **Group Home Parking**
Required Parking for Group Homes may be blocked provided that at least two parking spaces are accessible at all times.

(8) **Correctional Group Home Parking**
Required Parking for Correctional Group Homes may be blocked provided that at least two parking spaces are accessible at all times.

(9) **Designated Accessible Parking Spaces**
Where parking facilities are required, designated accessible parking spaces for the exclusive use of persons with disabilities shall be identified with a provincially regulated vertical sign displaying the international symbol for accessible parking spaces. Designated accessible parking spaces shall be included in the calculation of required parking and shall be provided in accordance with Table 1.2.7, 9(a) and 9(b):

Table 1.2.7

Required Parking	Designated Accessible Parking Spaces
5 to 50 spaces	1 designated accessible parking space
51 to 90 spaces	2 designated accessible parking spaces
Over 90 spaces	3% of required parking

(a) Medical office and institutional uses shall provide a minimum of one designated accessible parking space. Where out-patient services are provided, a minimum of 10% of the required parking shall be designated accessible parking spaces.
(b) Each designated accessible parking space shall meet the minimum width and area requirements of subsection (1) (a) above and shall be located adjacent to a delineated “accessible parking pathway” with a minimum width of 2.0 metres.

(10) **Bicycle Parking**
Bicycle Parking spaces shall be provided in conjunction with office, retail, and service commercial, industrial and institutional developments, in accordance with Table 1.2.8 and (10)(a):

Table 1.2.8

Use	Required Bicycle Parking
Retail, Retail Centre Service Commercial Office, Institutional	2 spaces plus 1 space/1000 m^2 GFA
Industrial	2 spaces plus 0.25 spaces/1000m^2 GFA
Elementary & Secondary School	1 space/10 students & 1 space/35 employees
Post-Secondary School	1 space/20 students

(a) Each bicycle parking space shall be 60 cm x 1.8 m in size